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Typeset by Disha DTP Team

Compiled & Edited by Disha Experts

DISHA PUBLICATION

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Indian Panorama

INDIAN STATES AND UNION TERRITORIES

Andhra Pradesh

Also known as : "Rice Bowl of India", "Egg Bowl of Asia"
Capital: Hyderabad
Largest City: Visakhapatnam
No. Of Districts : 13
Chief Minister: Nara Chandrababu Naidu
Governor: E. S. L. Narasimhan
Area: 160,205sq. km(61,855 sq mi)
Language: Telugu and Urdu
Date of Establishment:1st October 1953
Population: 49,386,799
Sex ratio: 992 females per 1000 males
Literacy Rate: 67.7%
Population Density(per sq km): 308
Forest Area: Total area covered by the forest are 22,862 sq. km
Agriculture : An exporter of many agricultural products and about 60 percent of population is engaged in agriculture and related activities. Rice is the major food crop and staple food of the state. Also grow wheat, jowar, bajra, maize, minor millet, coarse grain, many varieties of pulses, oil seeds, sugarcane, cotton, chilli-pepper and tobacco.
Industry: Home to firms like PepsiCo, Isuzu Motors, Cadbury India, Kellogg's, Colgate-Palmolive, Kobelco etc. Along with the largest PepsiCo plant in India.
Neighbouring states : Telangana in the North-West, Chhattisgarh in the north, Odisha in the North-East, Karnataka in the West, Tamil Nadu in the South and the water body of Bay of Bengal in the East.

Art & Culture:
(a) Classical dance forms (Sastriya Nrutyam) such as Kuchipudi, Bhamakalapam, Veeranatyam; and folk dances such as Butta bommalu, Tappeta Gullu, Lambadi, Dhimsa, and Chindu exists in Andhra Pradesh.
(b) Festivals : Sankranti, Maha Shivaratri, Ugadi or the Telugu New Year, Sri Rama Navami, Varalakshmi Vratam, Vinayaka Chaviti, Dasara, Atla Tadde, Deepavali, Deepothsavam during the Deepavali season.

Religious places: Tirupati or Tirumala is the richest pilgrimage centre in the world, dedicated to the god Venkateswara; Simhachalam is believed to be abode of the saviour-god Narasimha, who rescued Prahlada from abusive father Hiranyakasipu; Srisailam is dedicated mainly to Lord Shiva and is famous as one of the locations of the various Jyotirlingams.
Tribes: Andh, Bagata, Bhil, Chenchu, Gadabas, Bodo, Nakkala, Dhulia, Koya, Kotia, Jatapus, Kulia, Malis, Valmiki, Manna, Mukha, Pardhan, Porja.
Cuisines: Mutton Biryani, Mirchi Salan, Ghongpura Pickle, Korikoora
Animal: Blackback (Antilope *cervicapra*)
Bird: Indian Roller (Coracias *benghalensis*)

Arunachal Pradesh

Also known as: "The Orchid State of India" or "the Paradise of the Botanists"
Capital: Itanagar

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Largest City: Itanagar
No. Of Districts:19
Chief Minister: Nabam Tuki
Governor: Jyoti Prasad Rajkhowa
Area: 83,743 sq. km
Language: English
Date of Establishment: 20 February 1987
Population: 1,382,611
Sex Ratio: 920 females per 1000 males
Literacy Rate: 66.95%
Population density:17 per sq. km
Forest Area: 68045 sq. km.
Agriculture: Main crops:rice, maize, millet, wheat, pulses, sugarcane, ginger, and oilseeds. Also ideal for horticulture and fruit orchards.
Industry: Arts and Crafts, weaving, cane and bamboo, carpet weaving, wood carving, ornaments, tourism and horticulture.
Neighbouring States: Borders with the states of Assam and Nagaland to the south, and international borders with Bhutan in the west, Burma in the east and China in the north.
Art & Culture:

(a) Dance: Bardo Chham is a folk dance which depicts the victory of good over evil.
(b) Festivals: Losar" or The New Year festival, is the most important festival of Tawang District in Arunachal Pradesh.

Religious places: Parasuram Kunda attracts lots of devotees in January during the Parasuram mela Akashganga Temple is also called Malinithan temple and associated with the legend of Daksha Yagya and Sati's self-immolation.
Tribes: Abor, Aka, Apatani, Momba, Naga, Sherdukp, Nyishi, Galo, Khampti, Khowa, Mishmi, Idu, Hrusso, Tagin, Khamba, Adi
Cuisines: Chinese Cuisine & Apong (Local Beer)
Animal- Gayal (Bos *frontalis*)
Bird- Great Hornbill (Buceros *bicornis*)

Asom

Capital: Dispur
Largest City: Guwahati
No. Of Districts: 32
Chief Minister: Tarun Gogoi
Governor: Padmanabha Balakrishna Acharya
Area:78,550 sq. km
Language: Assamese, Bengali, Bodo
Date of Establishment: 1st April 1912
Population density:397 per sq km.
Forest Area:26,832 sq km
Agriculture : Asom's biggest contribution to the world is Asom tea and has its own variety of Camellia assamica. The state produces rice, rapeseed, mustard seed, jute, potato, sweet potato, banana, papaya, areca nut, sugarcane and turmeric.
Industry: The industries housed by the state include a chemical fertiliser plant at Namrup, petrochemical industries at Namrup and Bongaigaon, Paper mills at Jagiroad, Hindustan Paper Corporatio Ltd. Township Area Panchgram and Jogighopa, sugar mills at Barua Bamun Gaon, Chargola, Kampur, Cement plant at Bokajan and Badarpur, cosmetics plant of Hindustan Unilever (HUL) at Doom Dooma, etc.
Neighbouring States: Asom is surrounded by six of the other Seven Sister States: Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, and Meghalaya.
Art & Culture:

(a) Ankia Naat (Onkeeya Naat), a traditional Vaishnav dance-drama (Bhaona) popular since the 15th century AD. Folk dances like Bihu and the Bagurumba (both danced during festivals held in the spring), the Bhortal dance, the Ojapali dance etc.

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(b) Festivals: Bihu is the most important and common and celebrated all over Asom. Durga Puja is another festival celebrated with great enthusiasm. Muslims celebrate two Eids (Eid ul-Fitr and Eid al-Adha) with great zeal.

Religious places: Kamakhya Temple is one of the most famous temples.

Tribes: Mikirs, Khasis, Nagas, Barmans, Boro, Borokachari, Deori, Hojai, . Kachari, Sonwal, Lalung, Mech, Miri, Rabha, Dimasa, Hajong, Singhpho, Khampti, Garo.

Cuisines: Masor Tenga, Pitha

Animal: One-horned rhino (Rhinoceros *unicornis*)

Bird: White-winged wood duck (Cairina *scutulata*)

Bihar

Capital: Patna

Largest City: Patna

No. Of districts: 38

Chief Minister: Nitish Kumar

Governor: Ram Nath Kovind

Area:99,200 sq. km

Language: Hindi, Bhojpuri, Magadhi, Maithili, Urdu

Date of Establishment: 1st April 1936

Population: 103,804,637

Sex Ratio: 916 females per 1000 males

Literacy Rate: 63.4%

Population density:1,102 per sq km.

Forest Area:6,764.14 sq mi (2,612 sq mi)

Agriculture: Largest producer of vegetables, especially potatoes, onions, brinjal/egg-plant, and cauliflower. Largest producer of litchi, the third largest producer of pineapples and a major producer of mangoes, bananas, and guava. Sugarcane,jute cash crops

Industry: Three major firms — United Breweries Group, Danish Brewery Company Carlsberg Group and Cobra Beer — are to set up new units in Patna and Muzaffarpur in 2012.

Neighbouring States: It is contiguous with Uttar Pradesh to its west, Nepal to the north, the northern part of West Bengal to the east, and with Jharkhand to the south.

Art & Culture:

(a) Mithila painting is a style of Indian painting practised in the Mithila region of Bihar

(b) Festivals: Chhath, also called Dala Chhath, is an ancient and major festival in Bihar.Shravani mela,Teej and Chitragupta Puja along with all the major festivals of India are celebrated in Bihar.

Religious Places: Mahabodhi Temple is a Buddhist shrine and UNESCO World Heritage Site;

Mahavir Mandir in Patna; Takht Shri Harmandir Saheb in Patna and many more.

Tribes: Gonda, Mundas, Oraon, Gorait, Ho, Karmali, Kharia , Kha, Omitted, Binjhia, Birhor, Birjia, Chero.

Cuisines: Litti-Chokha, Sattu Paratha, Khaja, Khubi Ka Lai, Anarasa, Tilkut

Animal: Gaur (Bos *gaurue*)

Bird: House Sparrow (Passer *domesticus*)

Chhattisgarh

Also Known as: "Rice bowl of central India"

Capital: Raipur

Largest City: Raipur

No. Of Districts: 27

Chief Minister: Raman Singh

Governor: Balramji Das Tandon

Area:135,194 sq. km.

Language: Chattisgarhi, Hindi

Date of Establishment:1st November 2000

Population: 25,545,198

Sex Ratio: 991 females per 1000 males

Literacy Rate: 71.04%

Population density:189 per sq km.

Forest Area: 41.33% of the total state area

Agriculture: The main crops are rice, maize, kodo-kutki and other small millets and pulses oilseeds, such as groundnuts (peanuts), soybeans and sunflowers, are also grown. Horticulture and animal husbandry also engage a major share of the total population of the state.
Industry: Industries: Bhilai Steel Plant, Jindal Steel and Power, Bharat Aluminium Company, Baldev Alloys Pvt Ltd,Indian Oil Corporation
Engineering: Simplex Casting Ltd, CHPL-Dream-Homes (Chouhan Housing Pvt Ltd.), NMDC, South Eastern Coalfields, NTPC, Lanco Infratech, KSK Energy Ventures, Vandana Vidyut, Chhattisgarh State Power Generation Company and Jindal Power Limited.
Neighbouring States: Borders the states of Madhya Pradesh in the northwest, Maharashtra in the southwest Telangana and Andhra Pradesh in the south, Odisha in the east, Jharkhand in the northeast and Uttar Pradesh in the north.
Art & Culture: (a) Dances: Panthi, Rawat Nacha Pandwani, Chaitra, Kaksar, Saila and Soowa are the several indigenous dance styles of Chhattisgarh.
Festival–Bastar Dussere, Bhoramdeo Festival, Madai Festival. Hariyali, Kora, Navakhani are the major festival
Religious Places: Bhoramdeo temple, Rajivlochan temple, Chandrahasini Devi temple, Vishnu temple, Damudhara (Rishab Tirth) and Sivarinarayana Laxminarayana temple, Bambleshwari Temple, Danteshwari Temple and many more other ancient temples.
Tribes: Agariya, Andh, Baiga, Bhaina, Bharia, Halba, Kamar, Karku, Saur, Sawar, Sawara, Sonr , Majhi, Majhwar, Mawasi , Munda, Kharia, Kondh, Kol, Kolam, Pao.
Cuisines: Bafauri, Kusli, Red Ant Chutney
Animal: Wild buffalo (Bubalis *arnee*)
Bird: Bastar Hill myna (Gracula *religiosa*)

Goa

Capital: Panaji
Largest City: Vasco da Gama
No. Of districts: 2
Chief Minister: Laxmikant Parsekar
Governor: Mridula Sinha
Area: 3,702 sq km (1,429 sq mi)
Language: Konkani
Date of Establishment: 30th May, 1987
Population: 1,457,723
Sex ratio: 968 females per 1000 males
Literacy Rate: 88.70%
Population density:394 per sq km.
Forest Area:1,424 sq km (549.81 sq mi)
Agriculture: Rice the main agricultural crop, followed by areca, cashew and coconut.
Industry: Tourism is Goa's primary industry as it handles 12% of all foreign tourist arrival in India.
Neighbouring States: It is bounded by the state of Maharashtra to the north and by Karnataka to the east and south, while the Arabian Sea forms its western coast.
Art & Culture:
(a) Dance: Some of the traditional Goan dance art forms are Dekhnni, Fugdi, Corridinho, Mando, Dulpod and Fado.
(b) Festivals: The most popular celebrations in the Indian state of Goa are Ganesh Chaturthi, Diwali, Christmas, Easter, Samvatsar Padvo or Sanvsar Padvo, Shigmo, Goa Carnival. Goa known for its New Year's celebrations along with the Goan Carnival is known to attract a large number of tourists.

Religious places: Goa has two holy World Heritage Sites: the Bom Jesus Basilica and churches and convents of Old Goa. The Basilica holds the mortal remains of St. Francis Xavier, who is the patron saint of Goa.
Tribes: Dhodia, Dubla (Halpati), Naikda, Siddi, Varli, Kunbi, Gawda, Velip.
Cuisines: Vindaloo, Xacuti, Bibinca, Prawn Balchao
Animal: Gaur (Bos *gaurus*)
Bird: Black-crested bulbul (Pycnonotus *gularis*)

Gujarat

Also known as: Jewel of the Western part of India
Capital: Gandhinagar
Largest City: Ahmedabad
No. Of districts:33
Chief Minister: Anandiben Patel
Governor: Om Prakash Kohli
Area:196,204 sq km (75,755 sq mi)
Language: Gujarati
Date of Establishment:1 May 1960
Population:60,383,628
Sex Ratio: 918 females per 1000 males
Literacy Rate:79.31%
Population Density:310/ sq km(800/ sq mi)
Forest Area: 9.7% of the total geographical area is under forest cover
Agriculture: Gujarat's agriculture is majorly focussed on cotton production, livestock, fruits and vegetables, and wheat production.
Industry: Large scale industries such as Agro Marine Exports, Creative Castings Ltd., Gujarat Dairy Development Corporation, Austin Engineering and JSW Power Co. The Alang Ship Recycling Yard (the world's largest), General Motors manufactures, Tata Motors manufactures the Tata Nano and AMW trucks are made near Bhuj. Surat is the hub of the global diamond trade. According to Forbes list Ahmedabad ranks 3rd in the world's fastest growing cities in the world.
Neighbouring states: The state is bordered by Rajasthan to the north, Maharashtra to the south, Madhya Pradesh to the east, and the Arabian Sea as well as the Pakistani province of Sindh to the west.
Art & Culture :
(a) Rass-garba is a folk dance which is done as celebration of Navratri.
(b) Festivals: Makar Sankranti, Navratri, Uttarayana, Diwali, Holi, Tazia and others are celebrated with great enthusiasm.
Religious places: Somnath temple and the Sun Temple are some of the renowned Hindu temples. Palitana templesfor the Jain community; Sidi Saiyyed Mosque and Jama Masjid are holymosques for Muslims.
Tribes: Bhils, Barda, Bavacha, Charan, Gond, Dubla, Dhanka, Chodhara, Chaudhr, Charan, Gamit, Kunbi, Patelia, Pomla, Rabar, Rathawa, Siddi.
Cuisines: Thepla, Dhokla, Khandvi, Handvo, Panki
Animal: Asiatic lison (Panthera leo *persica*)
Bird: Greater Flamingo (Phoenicopterus *roseus*)

Haryana

Capital: Chandigarh
Largest City: Faridabad
No. Of Districts: 21
Chief Minister: Manohar Lal Khattar
Governor: Kaptan Singh Solanki
Area: 44,212 sq. km(17,070 sq mi)
Language: Hindi, Punjabi, Haryanvi
Date of Establishment:1 November 1966
Population: 25,351,462

Sex Ratio: 877 females per 1000 males
Literacy Rate: 76.64%
Population Density: 73 per sq km (1,480/sq mi)
Forest Area:1,684 sq km (650 sq mi)
Agriculture: Wheat and rice are the major crops making Haryana, the second largest contributor to India's central pool of food grains. The main crops are wheat, rice, sugarcane, cotton,oilseeds, gram, barley, corn, millet and many more.
Industry: National and international companies like Samsung, DB Schenker, Damco Solutions, Abacus Softech, Nokia Networks, Mitsubishi Electric, IBM, Huawei, General Electric, Tata Consultancy Services and Amdocs have their branch offices and contact centres in Faridabad and Gurgaon(also known as City of millennium). Large-scale companies like Orient Paper & Industries, JCB India Limited, Nirigemes, Agri Machinery Group (Escorts Limited), India Yamaha Motor Pvt. Ltd., Whirlpool, ABB Group, Goodyear Tyres and Knorr Bremse India Pvt. Ltd.
Neighbouring States: It is bordered by Punjab and Himachal Pradesh to the north, by Rajasthan to the west and south. The river Yamuna defines its eastern border with Uttar Pradesh.
Art & Culture: Festivals: Haryali Teej, Lohri, Gangore, Makar Sankranti, Gugga Naumi, Baisaki are some of the famous festivals of Haryana
Tourism: Surajkund International Crafts Mela, Sultanpur National Park, Kalesar National Park, Pinjore Gardens Resort, and Nahar Singh Mahal are some of the major tourist attraction.
Cuisine: Rabadi, Bajre ki Khichdi, Cholia, Chaach-Lassi, Kachri ki Sabzi
Animal: Blackbuck (Antilope *cervicapra*)
Bird: Black Francolin (Francolinus *francolinus*)

Himachal Pradesh

Name: Himachal Pradesh
Also known as: State of Apples, Dev Bhoomi(Abode of Gods)
Capital: Shimla
Largest City: Shimla
No. Of Districts:12
Chief Minister: Virbhadra Singh
Governor: Acharya Dev Vrat
Area: 55,673 sq. km(21,495 sq mi)
Language: Hindi, English
Date of Establishment: 25th January 1971
Population: 6,856,509
Sex Ratio: 974 females per 1000 males
Literacy Rate: 83.78%
Population Density: 123 per sq km (320/sq mi)
Forest Area: 66.52% of the total area
Agriculture: Agriculture contributes nearly 45% to the net state domestic product and 93% of the state population depends directly upon agriculture. The main cereals grown in the state are wheat, maize, rice and barley. Fruit cultivation has also proved to be an economic boon,with Apple farming producing the maximum income which amounts to 3 billion annually.
Industry: Textiles, pharmaceuticals, food procurement and processing, light engineering, IT and electronics, cement, tourism and hydropower are the key industries resident in the state with Himachal accounting for 25 per cent of the country's total hydro power potential.
Neighbouring States: It is bordered by Jammu and Kashmir on the north, Punjab on the west, Haryana on the south-west, Uttarakhand on the south-east and by the Tibet Autonomous Region on the east.

Art & Culture:

(a) Dances: Losar Shona Chuksam, Dangi, Gee Dance and Burah dance, Naati, Kharait, Ujagjama and Chadhgebrikar and Shunto are some of the known dance forms.

(b) Festivals: Kullu Dussehra, Shivratri Fair, Shoolini Mela (Solan), Minjar Fair, Mani Mahesh Chhari Yatra, Renuka fair, Lavi Trade Fair, Vrajeshwari fair, Jwalamukhi Fair, Holi Fair, and Naina Devi Fair, and Fulaich are some of the most celebrated festivals.

Tourism: The state is home to many famous hill stations such as Dalhousie, Kullu, Manali, Shimla, Nainital, Dharamsala, Mcleodganj and many more.

Tribes: Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura, Kinnara, Lahaula, Pangwala, Swangla, Beta, Beda, Domba.

Cuisines: Sidu, Aktori, Dham, Seppu Vadi, Badana, Babru

Animal: Snow Leopard (Uncia uncia or *Panthna uncia*)

Bird: Jujurana Western Irogapa (Trogopan *melanocephalus*)

Jammu and Kashmir

Also known as: Heaven on Earth
Capital: Srinagar
Largest City: Srinagar
No. Of Districts: 22
Chief Minister: Mufti Mohammad Sayeed
Governor: Narinder Nath Vohra
Area:222,236 sq. km(85,806 sq mi)
Language: English, Urdu
Date of Establishment: 26th October 1947
Population: 12,548,926
Sex Ratio: 883 females per 1000 males
Literacy Rate: 66.7%
Population Density: 56 per sq. km (150/sq mi)
Forest Area: 20230 sq. km
Agriculture: Known for its sericulture and cold-water fisheries. Wood to make high-quality cricket bats known as Kashmir Willow. Kashmiri saffron. Horticultural includes apples, apricots, cherries, pears, plums, almonds and walnuts with an annual turnover of over 3 billion (US$46 million).
Industry: Horticulture plays a pivotal role in the economy of the country.
Neighbouring States: It shares border with the states of Himachal Pradesh and Punjab to the south, an international border with China in the north and east, and the Line of Control separates it from the Pakistani-controlled territories of Azad Kashmir and Gilgit–Baltistan in the west and northwest respectively.
Art & Culture: Dances: The Dumhal is a famous dance in the Kashmir Valley, performed by men of the Wattal region whereas women perform the Rouff, another traditional folk dance of the region.
Religious places: Vaishno Devi temple, Amarnath, and Raghunath temple.
Nature Tourism: Gulmarg, Sonamarg, Leh, Pahalgam and many more are some of the most frequented hill stations.
Tribes: Balti, Beda, Bot, Boto, Brokpa, Drokpa, Dard, Shin, Changpa, Garra, Mon, Purigpa, Gujjar, Bakarwal, Gaddi, Sippi.
Cuisines: Gustaba, Tbak Maz, Dum Aloo, Haak or Karam ka Saag
Animal: Kashmir Stag (Cervus elaphus *hanglin*)
Bird: Black-necked crane (Grus *nigricollis*)

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Jharkhand

Also known as: "the Land of jungles" and "jharis"(bushes)
Capital: Ranchi
Largest City: Jamshedpur
No. Of Districts: 24
Chief Minister: Raghubar Das
Governor: Draupadi Murmu
Area: 79,714 sq. km (30,778 sq mi)
Language: Hindi, Santhali, Mundari, Ho
Date of Establishment: 15th November 2000
Population: 32,966,238
Sex Ratio: 947 females per 1000 males
Literacy Rate: 67.6%
Population Density: 414 per sq km (1,070/sq mi)
Forest Area: 23,605 sq.km which is 29.61% of the geographical area of the state
Agriculture: Rice, Pulses, Jackfruit, Blackberry, Mango and Litchi
Industry: Mining is the primary and most important source of economy for the state as it accounts to 40% of mineral resources of the state.
Neighbouring States: The state shares its border with the states of Bihar to the north, Uttar Pradesh and Chhattisgarh to the west, Odisha to the south, and West Bengal to the east.
Art & Culture: Dance: The most popular foll dances of Jharkhand are Jhumar, Paika, Chau, Agni, Santhal, Nanhai, Jamda, Ghatwari, Natwa, Chaukare, Sohrai, Lurisayro, Uatha Festivals: Karam festival, Vat savitri puja, Teej, Sohrai, Jitia Puja, Sarhul, Makar Sankranti, Deepavali, Durga Puja and many more are some of the most celebrated festivals.
Tourism: Sanctuaries: Palamau Tiger Reserves, Hazaribag Wildlife Sanctuary, Jawaharlal Nehru Biological Park, and Betla National Park
Tribes: Asur, Agaria, Baiga, Banjara, Bathudi, Bedia, Binjhia, Chero, Chik Baraik, Gond, Gorait, Ho, Karmali, Kharia, Kora, Kharwar, Khond, Kisan, Mudi-Kora, Korwa, Munda, Oraon, Lohra Santal, Sauria Paharia, Savar, Bhumij, Kawar, Kol
Cuisines: Thekua, Pua, Pittha, Marua-ka-Roti
Animal: Indian Elephant (Elephas maximus *indicus*)
Bird: Asian koel (Eudynamys *scolopacea*)

Karnataka

Capital: Bengaluru
Largest City: Bengaluru
No. Of Districts: 30
Chief Minister: Siddaramaiah
Governor: Vajubhai Vala
Area:191,791 sq. km(74,051 sq mi)
Language: Kannada
Date of Establishment:1st November 1956
Population: 61,130,704
Sex Ratio: 968 females per 1000 males
Literacy Rate:75.60%
Population Density: 320/ sq.km (830/sq mi)
Forest Area: 38,720 sq.km of forest area.
Agriculture: The main crops: rice, ragi, jowar, maize, and pulses (Tur and gram) besides oilseeds and number of cash crops. Cashews, coconut, arecanut, cardamom, chillies, cotton, sugarcane and tobacco are among the other crops produced in the state. Karnataka is the largest producer of coarse cereals, coffee, raw silk and tomatoes among the states in India. Karnataka occupies the second position in India in terms of production and 700 tons of flowers (worth Rs.500 million) were produced in 2004–05.

Industry: National Aerospace Laboratories, Bharat Heavy Electricals Limited, Indian Telephone Industries, Bharat Earth Movers Limited (BEML), Bharat Electronics Limited, Hindustan Machine Tools and Indian subsidiaries of Volvo and Toyota are headquartered in Bangalore.

Neighbouring States: Karnataka is bordered by the Arabian Sea and the Laccadive Sea to the west, Goa to the north west, Maharashtra to the north, Telangana to the North east, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west.

Art & Culture: (a) Dance: Mysore style of Bharatanatyam is the oldest and most popular dance form and is widely performed in Karnataka. Bolak-aat, Ummatt-aat and Komb-aat are some of the other forms of folk dances in the state.

(b) Festivals: Mysore Dasara is celebrated as the state festival of Mysore. Ugadi (Kannada New Year), Makar Sankranti (the harvest festival), Ganesh Chaturthi, Nagapanchami, Basava Jayanthi, Deepavali, and Ramzan are the other major festivals of Karnataka.

Tourism:

National Parks: Bandipur National Park, Bannerghatta National Park and Nagarhole National Park. Waterfalls: Gokak Falls, Unchalli Falls, Magod Falls, Abbey Falls, Jog falls and Shivanasamudra Falls

Tribes: Adiyan, Barda, Bavacha, Bhil, Chenchu, Chodhara, Dubla, Konda, Koraga, Kurumans, Maha Malasar, Malaikudi, Malasar, Malayekandi, Maleru, Maratha Patelia, Rathawa, Siddi, Sholaga, Soligaru , Toda, Varli, Vitolia

Cuisines: Bisi Bele Bhaat, Kesari Bath, Mysore Pak, Dharwad Pedha, Chiroti

Animal: Indian Elephant (Elephas maximus *indicus*)

Bird: Indian Roller (Coracias *benghalensis*)

Kerala

Also known as: God's own country
Capital: Thiruvananthapuram
Largest City: Kochi
No. Of Districts:14
Chief Minister: Oommen Chandy
Governor : P. Sathasivam
Area: 38,863 sq.km(15,005 sq mi)
Language: Malayalam, English
Date of Establishment: 1st July 1949
Population: 33,387,677
Sex Ratio: 1,084 females per 1000 males
Literacy Rate: 93.91%
Population Density: 860/sq.km (2,200/sq mi)
Forest Area: 10,336 sq.km (3,991 sq mi)
Agriculture: Kerala produces 97% of the national output of black pepper and accounts for 85% of the area under natural rubber in the country. Coconut, tea, coffee, cashew, and spices—including cardamom, vanilla, cinnamon, and nutmeg comprise a critical agricultural sector. The key agricultural staple is rice, with varieties grown in extensive paddy fields.

Industry: Software giants like Infosys, Oracle, Tata Consultancy Services, Capgemini, HCL, UST Global, Nest, Suntec and IBS have offices in the state. Thiruvananthapuram is also the "IT Hub of Kerala" and accounts for around 80% of the software exports. The Grand Kerala Shopping Festival (GKSF) claimed to be "Asia's largest shopping festival" was started in the year 2007.

Neighbouring States: It is bordered by Karnataka to the north and north east, Tamil Nadu to the east and south, and the Lakshadweep Sea to the west.

Art & Culture:

(a) Dance: The classical dance forms of Kerala are Kathakali, Mohiniyattam, Koodiyattom, Thullal and Krishnanattam.

(b) Festivals: Onam is a harvest festival celebrated by the people of Kerala.

Tourism:

Beaches: Kovalam, Varkala, Fort Kochi, Cherai, Payyambalam, Kappad, Muzhappilangad.

Hill stations: Munnar, Wayanad, Wagamon, Peermade, Paithalmala, Nelliampathi and Ponmudi.

National parks and sanctuaries: Periyar Tiger Reserve, Parambikulam Wildlife Sanctuary, Chinnar Wildlife Sanctuary, Thattekad Bird Sanctuary, Wayanad Wildlife Sanctuary, Muthanga Wildlife Sanctuary, Aralam Wildlife Sanctuary, Eravikulam National Park, and Silent Valley National Park.

Tribes: Adiyan, Arandan, Irular, Kadar, Cholanaickan, Paniyan, Ulladan , Ullatan, Uraly Mavilan, Karimpalan, Vetta Kuruman, Mala Panickar

Cuisines: Puttu-Kadala, Kappa-Meen Kari, Sadya Meal, Avial, Malabar Parotha, Payasam, Irachi Stew, Karimean Kari

Animal: Indian Elephant (Elephas maximus *indicus*)

Bird: Great Hornbill (Buceros *bicornis*)

Madhya Pradesh

Also known as: "Heart of India"

Capital: Bhopal

Largest City: Indore

No. Of Districts: 51

Chief Minister: Shivraj Singh Chauhan

Governor: Ram Naresh Yadav

Area: 308,245 sq.km (119,014 sq mi)

Language: Hindi

Date of Establishment: 1st November 1956

Population: 72,597,565

Sex Ratio: 930 females per 1000 males

Literacy Rate: 70.60%

Population Density: 236/sq.km (610/sq mi)

Forest Area: 94,689 sq.km (36,560 sq mi)

Agriculture: The state has an agrarian economy. The major crops of Madhya Pradesh are wheat, soybean, gram, sugarcane, rice, maize, cotton, rapeseed, mustard and arhar

Industry: Mining and Ordinance factories comprise the major industries.

Neighbouring States: It borders the states of Uttar Pradesh to the north-east, Chhattisgarh to the south-east, Maharashtra to the south, Gujarat to the west, and Rajasthan to the northwest.

Art & Culture:

(a) Dances: Badhai, Rai, Saira, Jawara, Sher, Akhara, Shaitan, Tertali, Charkula, Jawara, and Maanch are some of the majore dance forms.

(b) Festivals: Shivratri, Navratri, Dussehra, Diwali, Bahgoriya, Shab-I-Barat, Krishna Janamashtmi and many more.

Tourism:

National parks and sanctuaries: Kanha, Bandhavgarh, Pench, Panna, and Satpura National Park.

Hill Station: Pachmarhi and Amarkantak

Tribes: Bhil, Bhunjia, Biar, Binjhwar, Birhul, Damor, Dhanwar, Gadaba, Gond, Halba, Kamar, Karku, Kawar, Kondar, Kharia, Kondh, Kol, Kolam, Korku, Munda, Oraon, Panika, Pao, Pardhan, Saonta, Saur, Sawar, Sonr.

Cuisines: Lapsi, Bafla, Bhutte ki Khees, Bhopali Kabab

Animal: Barasingha (Rucervus *duvaucelii*)

Bird: Asian Paradise Flycatcher (Trepsiphone *paradisi*)

Maharashtra

Capital: Mumbai
Largest city: Mumbai
No. Of districts: 36
Chief Minister: Devendra Fadnavis
Governor: C. Vidyasagar Rao
Area: 307,713 sq.km(118,809 sq mi)
Language: Marathi
Date of establishment: 1st May 1960
Population: 112,372,972
Sex Ratio: 929 females per 1000 males
Literacy Rate: 82.9%
Population Density: 370/sq.km (950/sq mi)
Forest Area: 61,939 sq.km (23,915 sq mi)
Agriculture: Agriculture and allied activities contributes 12.9% to the state's income. Staples such as rice and millet are the main monsoon crops. Cash crops include sugarcane, cotton, oilseeds, tobacco, fruit, vegetables and spices such as turmeric.
Industry: Mumbai is also known as the financial capital of India and houses major corporate and financial institutions. Maharashtra contributes 25% of the country's industrial output and is manufacturing hub for some of the largest public sector industries in India, including Hindustan Petroleum Corporation, Tata Petrodyne and Oil India Ltd.
Neighbouring States: It shares its border with Arabian Sea to the west and states of Karnataka, Telangana, Goa, Gujarat, Chhattisgarh, Madhya Pradesh and the Union territory of Dadra and Nagar Haveli.
Art & Culture:

(a) Dances: Lavani is the most popular form of dance in the state. Koli dance is yet another form of folk dance.

(b) Festivals: Vijayadashami or Dasara, Navaratri, Holi, Diwali, Eid, Simollanghan is a ritual performed on Dasara or Viajaya Dashami day in Maharashtra.

Religious Tourism: Shirdi, Haji Ali Dargah, Tuljabhavani temple, Parvati temples, Chaturshringi Temple, Pataleshwar.
Nature Tourism: Amboli, Chikhaldara, Igatpuri, Jawhar, Karjat, Khandala, Lavasa, Lonavala, Mahabaleshwar, Matheran, Panchgani, Panhala, Toranmal
Tribes: Andh, Baiga, Barda, Bavacha, Bhaina, Bhunjia, Birhul, Kol, Halba, Kamar, Kathodi, Kolam, Khairwar, Kharia, Kokna, Parja, Patelia, Pomla, Rathawa, Sawar, Thakur, Varli, Vitolia
Cuisines: Shrikhand, Thalipeeth, Vada Pao, Modak
Animal: Indian Giant Squirrel (Ratufa *indica*)
Bird: Yellow footed green pigeon (Treron *phoenicoptera*)

Manipur

Also known as: "Gateway to the East"
Capital: Imphal
Largest city: Imphal
No. Of districts: 9
Chief Minister: Okram Ibobi Singh
Governor: Syed Ahmed
Area: 22,327 sq.km(8,621 sq mi)
Language: Meeteilon
Date of establishment: 21st Jan. 1972
Population: 2,570,390
Sex Ratio: 987 females per 1000 males
Literacy Rate: 79.21%
Population Density: 120/sq.km (300/sq mi)
Forest Area: 14,365 dq.km
Agriculture: Manipur's climate and soil conditions are ideally suited for horticultural crops. It is home for

variety of rare and exotic medicinal and aromatic plants. Some cash crops suited for Manipur include litchi, cashew nuts, walnuts, orange, lemon, pineapple, papaya, passion fruit, peach, pear and plum.

Industry: Its economy is primarily agriculture, forestry, cottage and trade driven. Manipur has the highest number of handicrafts units and number of craftspersons, in the entire northeastern region of India. The state is covered with over 3,000 square km of bamboo forests, making it one of India's largest contributors to its bamboo industry.

Neighbouring States: It is bounded by Nagaland to the north, Mizoram to the south, and Assam to the west; Burma lies to its east.

Art & Culture:

(a) Dances: Manipuri dance (Ras Lila)

(b) Festivals: The various festivals of Manipur are Lui-ngai-ni Ningol Chakouba, Yaoshang, Ganngai, Chumpha, Christmas, Cheiraoba, Kang and Heikru Hidongba.

Nature Tourism: Loktak Lake, Kaina, Keibul Lamjao National Park, Sadu Chiru waterfall and Thalon Cave.

Tribes: Aimol, Anal, Angami, Chiru, Chothe, Gangte, Hmar, Kabui, Koireng, Kom, Lamgang, Mao, Maram, Maring, Mizo, , Suhte, Tangkh, Thadou, Vaiphui, Zou, Kuki.

Cuisines: Iromba, Kabok, Chakkounba

Animal: Sangai (Cervus *eldi*)

Bird: Mrs. Humes Pheasant (Syrmaticus *humiae*)

Meghalaya

Also known as: "the abode of the clouds"

Capital: Shillong

Largest city: Shillong

No. Of districts: 11

Chief Minister: Mukul Sangma

Governor: V. Shanmuganathan

Area: 22,429 sq.km(8,660 sq mi)

Language: English, Khasi and Garo

Date of establishment: 21 January 1972

Population: 2,964,007

Sex Ratio: 986 females per 1000 males

Literacy Rate: 75.84%

Population Density :130/sq.km (340/sq mi)

Forest Area: 9,496 sq.km (3,666 sq mi)

Agriculture: Basically an agricultural state with about 80% of population depending entirely on agriculture for their livelihood. Rice, maize, wheat and a few other cereals and pulses. The important cash crops potato, ginger, turmeric, black pepper, areca nut, tezpatta, betelvine, short-staple cotton, jute, mesta, mustard and rapeseed etc. Horticultural crops like orange, lemon, pineapple, guava, litchi, banana, jack fruits and fruits such as plum, pear and peach.

Industry: Meghalaya has a rich base of natural resources which include minerals such as coal, limestone, sillimanite, Kaolin and granite among others.

Neighbouring States: This state is bounded to the south by the districts of greater Mymensingh and the Division of Sylhet and the west by the Division of Rangpur of Bangladesh and the north and the east by Assam.

Art & Culture:

(a) Dances: Nongkrem` is an important folkdance from the Meghalaya.

(b) Festivals: Shivratri, Nongkrem Dance Festival, and Wangala or the harvest Festival.

Tourism: Mawphlang sacred forest, limestone and sandstone caves, and some of the popular waterfalls like the Elephant Falls, Shadthum Falls, Weinia falls, Bishop Falls, Nohkalikai Falls, Langshiang Falls and Sweet Falls.

Tribes: Chakma, Dimasa, Garo, Hajong, Hmar, Khasi, Jaintia, Kuki, Pawi, Synteng, Boro, Koch, Raba, Lakher, Man, Naga, Mikir, Mizo.

Cuisines: Jadoh, Kyat (local beer). Bitchi

Animal: Clouded Leopard (Neofelis *nebulosa*)

Bird: Hill Myna (Gracula *religiosa*)

Mizoram

Also known as: "land of the hill people"

Capital: Aizawl

Largest city: Aizawl

No. Of districts: 8

Chief Minister: Pu Lalthanhawla

Governor: Lt General Nirbhay Sharma

Area: 21,087 sq.km(8,142 sq mi)

Language: Mizo

Date of establishment: 20th February 1987

Population: 1,091,014

Sex Ratio: 975 females per 1000 males

Literacy Rate: 91.58%

Population Density: 52/sq.km(130/sq mi)

Forest Area: 1,594,000 hectares (3,940,000 acres)

Agriculture: 55% to 60% of the working population of the state is annually deployed on agriculture. Rice remains the largest crop grown in the state; fruits are the second largest category, followed by condiments and spices.

Industry: Handloom, horticulture industries, forestry, fisheries and sericulture

Neighbouring States: The state shares borders with three of the seven sister states, namely Tripura, Assam, Manipur and a 722 km border with the neighbouring countries of Bangladesh and Myanmar.

Art & Culture:

(a) Dances: Cheraw, Khuallam, Chheihla, Chai

(b) Festivals: Chapchar Kut, Thalfavang Kut, Mim Kut, Pawl Kut, Christmas and Easter.

Tourism:

National parks and sanctuaries: Murlen National Park, Dampa Tiger Reserve, Khawnglung Wildlife Sanctuary.

Hill stations: Hmuifang Tlang, Reiek Tlang

Tribes: Chakma, Dimasa, Garo, Hajong, Hmar, Khasi, Jaintia, Kuki, Mikir, Naga, Pawi, Synteng, Paite, Lakher, Man.

Cuisines: Zu (a special tea)

Animal: Hoolock gibbon (Hoolock *hoolock*)

Bird: Mrs. Humes pheasant (Syrmaticus *humaie*)

Nagaland

Also known as: "falcon capital of the world"

Capital: Kohima

Largest city: Dimapur

No. Of districts: 11

Chief Minister: T. R. Zeliang

Governor: Padmanabha Acharya

Area: 16,579 sq.km(6,401 sq mi)

Language: English

Date of establishment: 1st December 1963

Population: 1,980,602

Sex Ratio: 931

Literacy Rate: 80.11%

Population Density: 119/sq.km (310/sq mi)

Forest Area: About one-sixth of the state's area is covered by tropical and sub-tropical evergreen forests.

Agriculture: The main crops of the state are rice, millet, maize, and pulses. Cash crops, like sugarcane and potato, are also grown in some parts. Plantation crops such as premium coffee, cardamom, and tea are grown in hilly areas in small quantities.

Industry: Forestry is also an important source of income. Cottage industries such as weaving, woodwork, and pottery are also an important source of revenue.

Neighbouring States: It borders the state of Assamto the west, Arunachal Pradesh and part of Assam to the north, Burma to the east and Manipur to the south.

Art & Culture:

(a) Dances: Zeliang is the one of the most artistic dance forms.

(b) Festivals: Nagaland is known as the land of festivals. The Hornbill Festival in December, Sekrenyi, Tsukhenyie, Mimkut, Bishu, Aoling, Moatsu, Tuluni, Nyaknylum, Mongmong, Tokhu Emong and Yemshe are some of the important festivals celebrated by the various Naga tribes.

Tribes: Naga, Kuki, Kachari, Mikir, Garo

Cuisines: Momos, Rice Beer, and Cherry Wine

Animal: Gaur (Bos *gaurus*)

Bird: Blyth's Tragopan (Tragopan *blythii*)

Odisha

Capital: Bhubaneshwar

Largest city: Bhubaneshwar

No. Of districts: 30

Chief Minister: Naveen Patnaik

Governor: S.C. Jamir

Area: 155,820 sq.km(60,160 sq mi)

Language: Odia, English

Date of establishment: 1st April 1936

Population: 41,947,358

Sex Ratio: 978 females per 1000 males

Literacy Rate: 73.45%

Population Density: 270/sq.km (700/sq mi)

Forest Area: 48,903 sq.km

Agriculture: Rice is the dominant crop in Odisha and is grown on 77% of the area under cultivation. The state is the fourth largest shrimp producing state in India.

Industry: Industries like manufacturing; mining and quarrying; electricity, gas and water supply; and construction are dominant in the state. NALCO and Vedanta, two of the biggest aluminium plants are in Odisha which makes the state leading producer of aluminium in the state.

Neighbouring States: It shares its borders with states of West Bengal to the north-east, Jharkhand to the north, Chhattisgarh to the west and north-west, Telangana to the south-west and Andhra Pradesh to the south.

Art & Culture:

(a) Dances: Odissi is one of the oldest and most important classical dance forms in the state. Other dance forms include: Ghumura Dance, Chhau dance, Mahari dance, and Gotipua.

(b) festivals: Durga Puja, Kumar Purnima, Deepabali, Prathamastami, Vasant Panchami, Maha Shivaratri, Ratha Yatra, Ganesh Chaturthi, Raja Parba are some of the major festivals celebrated across Odisha.

Religious Places: Lingaraja Temple at Bhubaneswar, Jagannath Temple, Puri and the Konark Sun Temple and Maa Sarala Temple at Tirtol town.

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Nature Tourism: Udayagiri and Khandagiri Caves, Dhauli, Chilika Lake, Bhitarkanika National Park, Simlipal National Park.
Tribes: Bagata, Bathudi, , Birhor, Didayi, Didayi, Chenchu, Dal, Desua, Gandia, Ghara, Gond, Ho, Holva, Kandha, Munda, Kol, Kolah Laharas, Kol Loharas, Kolha, Koli, Mahali, Mankidi, Mankirdia, Pentia, Rajuar, Santal, Saora,
Cuisines: Fish Orly, Khirmohan, Rsabali, Chhenapodapitha
Animal: Sambar (Rusa *unicolor*)
Bird: Indian Roller (Coracias *benghalensis*)

Punjab

Also known as: "Granary of India", "India's bread-basket"
Capital: Chandigarh
Largest city: Ludhiana
No. Of districts: 22
Chief Minister: Parkash Singh Badal
Governor: Kaptan Singh Solanki
Area: 50,362 sq.km (19,445 sq mi)
Language: Punjabi
Date of establishment: 15th August 1947
Population: 27,704,236
Sex Ratio: 893 females per 1000 males
Literacy Rate: 76.68%
Population Density: 550/sq. km (1,400/sq mi)
Agriculture: Wheat is the most important crop of the state. Rice, sugarcane, fruits and vegetables are also grown. The state produces 10.26% of India's cotton, 19.5% of India's wheat, and 11% of India's rice.
Industry: Industries include the manufacturing of scientific instruments, agricultural goods, electrical goods, financial services, machine tools, textiles, sewing machines, sports goods, starch, tourism, fertilisers, bicycles, garments, and the processing of pine oil and sugar. Punjab also has the largest number of steel rolling mill plants in India, which are located in "Steel Town"—Mandi Gobindgarh in the Fatehgarh Sahib district.
Neighbouring States: The state is bordered by the Indian states of Himachal Pradesh to the east, Haryana to the south and southeast, Rajasthan to the southwest, and the Pakistani province of Punjab to the west. To the north it is bounded by the Indian state of Jammu and Kashmir.
Art & Culture:
(a) Dances: Bhangra and Giddha are the major dance forms of the state.
(b) Festivals: Bandi Chhor Divas (Diwali), Mela Maghi, Hola Mohalla, Rakhri, Vaisakhi, Lohri, Teeyan and Basant.
Religious Places: The Golden Temple in Amritsar and Sri Anandpur Sahib are the major religious attraction of the state.
Cuisines: Dal Makhni, Makke di Roti-Sarson da Saag, Chana Bhature
Animal: Blackbuck (Antilope *cervicapra*)
Bird: Northern Goshawk (Accipiter *gentilis*)

Rajasthan

Name: Rajasthan
Capital: Jaipur
Largest city: Jaipur
No. Of districts: 33
Chief Minister: Vasundhara Raje
Governor: Kalyan Singh
Area: 342,239 sq.km(132,139 sq mi)
Language: Hindi, Rajasthani
Date of establishment: 1st November 1956

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Population: 73,529,325
Sex Ratio: 926 females per 1000 males
Literacy Rate: 67.68%
Population Density: 201/sq.km (520/sq mi)
Agriculture: Wheat, barley, pulses, sugarcane and oilseeds are cultivated over large areas. Cotton and tobacco are the main cash crops. The largest producers of edible oils in India and the second largest producer of oilseeds. The biggest wool-producing state in India and the main opium producer and consumer.
Industry: Main industries are mineral, agriculture, and textile based. The second largest producer of polyester fibre in India.
Neighbouring States: It shares a border with the Pakistani provinces of Punjab to the northwest and Sindh to the west, along the Sutlej-Indus river valley. Elsewhere it is bordered by the other Indian states: Punjab to the north; Haryana and Uttar Pradesh to the northeast; Madhya Pradesh to the southeast; and Gujarat to the southwest.
Art & Culture:
(a) Dances: Ghoomar dance from Udaipur and Kalbeliya dance of Jaisalmer
(b) Festivals: Deepawali, Holi, Gangaur, Teej, Gogaji, Shri Devnarayan Jayanti, Makar Sankranti and Janmashtami
Religious Places: The Brahma temple at Pushkar, Dilwara Temples of Mount Abu, Ranakpur Temple in Pali District, Mehandipur Balaji Temple, Karni Mata Temple of Bikaner, Ajmer Sharif Dargah are some of the important religious places in the state.
Cuisines: Dal-Bati-Churma, Ker Sangari, Lal Maas, Gatte
Animal: Chinkara (Gazella *bennettii*)
Bird: Great Indian Bustard (Ardeotis *nigriceps*)

Sikkim

Capital: Gangtok Largest city: Gangtok
No. Of districts: 4
Chief Minister: Pawan Chamling
Governor: Shriniwas Dadasaheb Patil
Area: 7,096 sq.km (2,740 sq mi)
Language: Nepali, Bhutia, Gurung, Lepcha, Limbu, Manggar, Newari, Sherpa, Sunwar, Tamang
Date of establishment: 16th May 1975
Population: 607,688
Sex Ratio: 889 females per 1000 males
Literacy Rate: 82.2%
Population Density: 86/sq.km (220/sq mi)
Forest Area: 81% of the state area
Agriculture: Crops such as Rice, maize, millet, wheat, barley, oranges, tea and cardamom are grown here. Sikkim is the leading producer of cardamom in India
Industry: Brewing, distilling, tanning and watches are the main industries. The state has also invested in a fledgling gambling industry, promoting both casinos and online gambling. The Playwin lottery has been a notable success in the state.
Neighbouring States: The state is bordered by Nepal to the west, China's Tibet Autonomous Region to the north and east, and Bhutan to the east. The Indian state of West Bengal lies to the south.
Art & Culture:
(a) Dances: Singhi Chham is a masked dance of Sikkim.

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(b) Festivals: Diwali, Dussera, Maghe Sankranti, Bhimsen Puja, Losar, Loosong, Saga Dawa, Lhabab Duechen, Drupka Teshi, Bhumchu, Eid ul-Fitr, Muharram and Christmas are the major festivals celebrated in the state.

Religious Places: Rumtek Monastery, Tsongmo Lake, Nathu la pass, Gurudongmar Lake

Tribes: Bhutia, Lepcha, Limboo, Tamang

Cuisines: Momos, Thukpa, Gundruk, Phagshapa and Seal Roti

Animal: Red panda (Ailurus *fulgens*)

Bird: Blood pheasant (Ithaginis *cruentus*)

Tamil Nadu

Capital: Chennai

Largest city: Chennai

No. Of districts: 32

Chief Minister: J Jayalalithaa

Governor: Konijeti Rosaiah

Area: 130,058 sq.km(50,216 sq mi)

Language: Tamil

Date of establishment: 26th January 1950

Population: 72,147,030

Sex Ratio: 995 females per 1000 males

Literacy Rate: 80.33 %

Population Density: 550/sq.km (1,400/sq mi)

Forest Area: 22,643 sq.km(8,743 sq mi)

Agriculture: Rice is the leading crop and the Cauvery delta region is known as the Rice Bowl of Tamil Nadu. Mango and banana are the leading fruit crops. The main vegetables grown are tapioca, tomato, onion, brinjal(eggplant), and drumstick.

Industry: Textiles, leather, electronics, heavy industries, engineering, software, and automobiles are the leading industries of the state. Integral Coach Factory which is located in Perambur is the largest producer of railway coaches in Asia.

Neighbouring States: The state is bordered by the union territory of Puducherry and the south Indian states of Kerala, Karnataka, and Andhra Pradesh. It also shares a maritime border with the nation of Sri Lanka.

Art & Culture:

(a) Dances: Bharatanatyam is the famous dance forms of Tamail Nadu. Other forms of folk dances are Karakattam,Mayilam.

(b) Festivals: Pongal is the most celebrated festival of the state. Other major festivals are Deepavali, Ayudha Poojai, Saraswathi Poojai (Dasara), Krishna Jayanthi and Vinayaka Chathurthi, Eid ul-Fitr, Bakrid, Milad un Nabi, Muharram, Good Friday, Easter are celebrated in the state.

Religious Places: Chidambaram, Thiruvannaamalai, Brihadishwara Temple, Gangaikonda Cholapuram, Madurai Meenakshi Amman Temple, Sri Ranganathaswamy Temple, Srirangam, Tiruchirappalli, and Rameshwaram are the famous religious places of the state.

Tribes: Adiyan, Aranadan, Eravallan, Irular, Kadar, Kammara, Kaniyan, Kanyan, Kattunayakan, Kochu, Konda, Kondareddis, Koraga, Kota Muthuvan, Malai, Malakkuravan, Malasar, Malayali , Palliyar, Paniyan, Sholaga, Toda.

Cuisines: Appam, Dosai, Idli, Sambhar, Rasam, Chettinad Chicken, Pongal

Animal: Nilgiri Tahr (Nilgiritragus *hylocrius*)

Bird: Emerald Dove (Chalcophaps *indica*)

Telangana

Capital: Hyderabad
Largest city: Hyderabad
No. Of districts: 10
Chief Minister: Kalvakuntla Chandrashekar Rao
Governor: E. S. L. Narasimhan
Area: 114,840 sq.km(44,340 sq mi)
Language: Telugu, Urdu
Date of establishment: 2nd June 2014
Population: 35,193,978
Literacy Rate: 66.50%
Population Density: 310/sq.km (790 /sq mi)
Agriculture: Rice is the major food crop and staple food of the state. Other important crops are Maize, Tobacco, Mango, Cotton and Sugar cane
Industry: Automobiles and auto components industry, spices, mines and minerals, textiles and apparels, pharmaceutical, horticulture, poultry farming
Neighbouring States: The state shares its borders with Maharashtra, Chhattisgarh to the north, and Karnataka to the west, and Andhra Pradesh to the south, east and north east.
Art & Culture:

(a) Classical dance forms (Sastriya Nrutyam) such as Kuchipudi, AndhraNatyam, Bhamakalapam, Veeranatyam; and folk dances such as Butta bommalu, Tappeta Gullu, Lambadi, Dhimsa, and Chindu.
(b) Festivals: Sankranti, Maha Shivaratri, Ugadi or the Telugu New Year, Sri Rama Navami, Varalakshmi Vratam, Vinayaka Chaviti, Dasara, Atla Tadde, Deepavali, Deepothsavam during the Deepavali season.

Religious Places: Alampur Jogulamba temple, Gnana Saraswati Temple, Bhadrachalam Temple, Sri Raja Rajeswara Swami temple and the Thousand Pillar Temple are some of the famous temples of the state.
Cuisines: Gongura Ghosht, Pappuchura, Gongura Pappu, Hyderabadi Biryani
Animal: Chital (Zinka)
Bird: Pala Pitta (Coracias *benghalensis*)

Tripura

Capital: Agartala
Largest city: Agartala
No. Of districts: 8
Chief Minister: Manik Sarkar
Governor: Tathagata Roy
Area: 10,491.69 sq.km(4,050.86 sq mi)
Language: Bengali and Kokborok
Date of establishment: 21st Jan. 1972
Population: 3,671,032
Sex Ratio: 961 females per 1000 males
Literacy Rate: 94.65%
Population Density: 350/sq.km (910/sq mi)
Forest Area: 57.73% of the state
Agriculture: Rice, potato, sugarcane, mesta, pulses, and jute are some of the crops grown in the state. Jackfruit and pineapple are among the horticultural products.
Industry: Brickfields and tea industry
Neighbouring States: The state is bordered by Bangladesh to the north, south, and west, and Assam and Mizoram to the east.
Art & Culture: Goria dance, Jhum dance, lebang dance, mamita dance, and mosak sulmani dance are some of the dance forms of the state.
Tourism: Ujjayanta Palace, Kunjaban Palace, Neermahal – Lake Palace, Laxminarayan Temple, Uma Maheswar Temple, Jagannath Temple, Benuban Bihar, Gedu Mian Mosque, Malancha

Niwas, Rabindra Kanan, Purbasha, Handicrafts Designing Centre, Fourteen Goddess Temple, and Portuguese Church are some of major tourist attractions.

Tribes: Bhil, Bhutia, Chaimal, Chakma, Garoo, Halam, Khasia, Kuki, Mag , Munda, Noatia, Orang, Riang, Santal, Tripura

Cuisines: Chakhwi, Mwkhwi, Muitru

Animal: Phayre's Langur (Trachypithecus *phayrel*)

Bird: Green Imperial Pigeon (Dacula *genea*)

Uttarakhand

Also known as: "Land of the Gods"

Capital: Dehradun

Largest city: Dehradun

No. Of districts: 13

Chief Minister: Harish Rawat

Governor: Krishan Kant Paul

Area: 53,483 sq.km(20,650 sq mi)

Language: Hindi, Sanskrit, Garhwali, Kumaoni

Date of establishment: 9th November 2000

Population: 10,116,752

Sex Ratio: 963 females per 1000 males

Literacy Rate: 79.63%

Population Density: 189/sq.km (490/sq mi)

Forest Area: 34651 sq.km

Agriculture: Basmati rice, wheat, soybeans, groundnuts, coarse cereals, pulses, and oil seeds are the major crops grown in the state.

Industry: Tourism and hydropower are the major industries of the state.

Neighbouring States: It borders Tibet on the north; the Mahakali Zone of the Far-Western Region, Nepal on the east; and the Indian states of Uttar Pradesh to the south and Himachal Pradesh to the northwest.

Art & Culture:

(a) Dances: Langvir Nritya, Barada Nati, Hurka Baul, Jhora-Chanchri, Jhumaila, Chauphula, and Chholiya.

(b) Festivals: Kumbh Mela, Kanwar Yatra, Kandali Festival, Ramman, Harela mela, Nauchandi mela, Uttarayani mela and Nanda Devi Mela take place.

Tourism: It is home to some most frequented hill stations like Mussoorie, Nainital, Dhanaulti, Lansdowne, Pauri, Sattal, Almora, Kausani, Bhimtal, and Ranikhet. National parks in the state include Jim Corbett National Park, Rajaji National Park, Nanda Devi National Park, and Valley of Flowers National Park. Badrinath and Kedarnath are one of the most auspicious and holy pilgrimages housed by the state.

Tribes: Bhotia, Buksa, Jaunsari, Raji, Tharu

Cuisines: Aloo ke Gutke, Kaapa, Jhangora (millets) ki Kheer, Chainsoo

Animal: Musk deer (Moschus *cupreus*)

Bird: Himalayan Monal (Lophophorus *impejanus*)

Uttar Pradesh

Also known as: 'Hindi heartland of India'

Capital & Largest city: Lucknow

No. Of districts: 75

Chief Minister: Akhilesh Yadav

Governor: Ram Naik

Area: 243,286 sq.km(93,933 sq mi)

Language: Hindi, Urdu

Date of establishment: 1st April 1937 as the United Provinces

Population: 199,581,477

Sex Ratio: 908 females per 1000 males

Literacy Rate: 69.7%

Population Density: 820/sq.km (2,100/sq mi)
Forest Area: 16,583 sq.km (6,403 sq mi)
Agriculture: Wheat is the major food crop; and sugarcane is the main commercial crop with 70% of sugar produce from the state.
Industry: Major industries include electronics, electrical equipment, cables, steel, leather, textiles, jewellery, frigates, automobiles, railway coaches, etc
Neighbouring States: The state shares its border with Rajasthan to the west, Haryana and Delhi to the northwest, Uttarakhand and the country of Nepal to the north, Bihar to the east, Jharkhand to the southeast, Chhattisgarh to the south and Madhya Pradesh to the southwest.
Art & Culture:
(a) Dances: Kathak is most popular dance form.
(b) Festivals: Diwali, Buddha Purnima, Christmas, Rama Navami, Vijayadashami, Makar Sankranti, Vasant Panchami, Ayudha Puja, Ganga Mahotsava, Janmashtami, Sardhana Christian Fair, Maha Shivaratri, Mahavir Jayanti, Moharram, Barah Wafat, Eid, Bakreed, Chhath puja, Lucknow Mahotsav, Kabob and Hanuman Jayanti.
Tourism: Taj Mahal, Agra Fort, Bara Imambara, Fatehpur Sikri, Sarnath, Kushinagar, Patna Bird Sanctuary and many more are the major tourist attractions of the state.
Tribes: Bhotia, Buksa, Jaunsari, Raji, Tharu, Gonda, Baiga, Parahiya, Saharya, Chero, Kharwar, Bhuiya, Pankha, Baiga.
Cuisines: Kabab, Biryanis, Bedmi Aloo, Kachori, Banarasi Chaat
Animal: Swamp Deer (Rucervus *duvaucelii*)
Bird: Sarus Crane (Grus *antigone*)

West Bengal

Capital & Largest city: Kolkata
No. Of districts: 20
Chief Minister: Mamata Banerjee
Governor: Keshari Nath Tripathi
Area: 88,752 sq.km (34,267 sq mi)
Language: Bengali and English
Date of establishment: 15th August 1947
Population: 91,347,736
Sex Ratio: 947 females per 1000 males
Literacy Rate: 77.08%
Population Density: 1,000/sq.km (2,700/sq mi)
Forest Area: 16,805 sq.km (6,488 sq mi)
Agriculture: Rice, potato, jute, sugarcane and wheat
Industry: steel, leather, textiles, jewellery, frigates, automobiles, electronics, electrical equipment etc are the major manufacturing industries of West Bengal.
Neighbouring States: The state is surrounded by the countries of Bangladesh, Nepal and Bhutan, and the states of Odisha, Jharkhand, Bihar, Sikkim, and Assam
Art & Culture:
(a) Dances: Chau dance and many other folk dances.
(b) Festivals: Durga Puja, Poila Baishakh (the Bengali New Year), Rathayatra, Dolyatra or Basanta-Utsab, Nobanno, Poush Parbon, Kali Puja, Saraswati Puja, Laxmi Puja, Christmas, Eid ul-Fitr, Eid ul-Adha, Buddha Purnima, Muharram, Christmas
Tourism: Dakshineswar Kali Temple, Tipu Sultan Mosque, St Paul's Cathedral, Victoria Memorial,

Howrah Bridge, Vidyasagar Setu are some of the major tourist attractions. Popular national parks include Sundarbans National Park, Buxa Tiger Reserve, Gorumara National Park, Neora Valley National Park, Singalila National Park, and Jaldapara National Park.

Tribes: Asur, Baiga, Bedia, Chero, Chik Baraik, Garo, Gond, Gorait, Haja Mru, Munda, Nagesia, Oraon, Parhaiya, Rabha, Santal, Sauria Paharia, Savar, Limbu

Cuisines: Rosogulla, Mishti Doi, Bhapa Illish

Animal: Fishing cat (Prionailurus *viverrinus*)

Bird: White-breasted Kingfisher (Halcyon *smyrnensis*)

Andaman and Nicobar Islands

Capital & Largest city: Port Blair

No. Of districts: 3

Area: 8,073 sq.km(3,117 sq mi)

Language: English, Hindi

Date of establishment: 1st November 1956

Population: 379,944

Sex Ratio: 878 females per 1,000 males

Literacy Rate: 86.27%

Population Density: 46 per sq.km

Forest Area: 86.2% of the total land area.

Agriculture: Paddy, oilseeds and vegetables

Industry: Small scale industries and handicraft units; Tourism plays an important role in the economy of the union territory.

Tourism: The island serves as an excellent tourist destination with major attractions like Havelock island, Cellular Jail, Mahatma Gandhi Marine National Park, Andaman Water sports complex, Chatham Saw Mill, Mini Zoo, Corbyn's cove, Chidiya Tapu, Wandoor Beach, Forest Museum, Cinque island, Mt Harriet and Mud Volcano, Neil Island and many more.

Tribes: Andamanese, Chariar, Chari, Kora, Tabo, Bo, Yere, Kede, Bea, Balawa, Bojigiyab, Juwai, Kol, Jarawas, Nicobarese, Onges, Sentinelese, Shom.

Chandigarh

Also known as: "Wealthiest Town of India"

Administrator: Kaptan Singh Solanki

Mayor: Poonam Sharma

Commissioner: Vivek Pratap Singh

Area: 114 sq.km(44 sq mi)

Language: English, Hindi, Punjabi

Date of establishment: 1st Nov, 1966

Population: 1,054,686

Sex Ratio: 818 females per 1000 males

Literacy Rate: 81.9%

Population Density: 9,300/sq.km (24,000/sq mi)

Industry: Pharmaceuticals, machinery, food products, and electrical appliances are some of the major industries.

Neighbouring states: The union territory shares its border with Haryana and Punjab.

Tourism: Kasauli, Sukhna Lake, Leisure Valley, Rock Garden and many more are the major tourist attraction.

Cuisines: Butter Chicken, Tandoori Chicken, Mutton Pulao

Dadra and Nagar Haveli

Capital: Silvassa

Administrator: Ashish Kundra

Area: 102 sq.km (39 sq mi)

Language: English, Gujarati, Hindi, Marathi

Date of establishment: 11th August 1961

Population: 342,853
Sex Ratio: 775 females per 1000 males
Literacy Rate: 77.65%
Population Density: 698 per sq.km
Forest Area: 43% of the land is under forest cover
Agriculture: paddy, ragi, small millets, jowar, sugarcanes
Industry: Agriculture, Industries, Forestry, Animal Husbandry and Tourism
Neighbouring states: It is surrounded by Valsad District of Gujarat on the West, North and East and by Thane District of Maharashtra on the South and South-East.
Tourism: Vanganga Lake Garden, Hirwavan garden, Piparia, Tribal Museum, Vandhara Udyan, Mini Zoo and Bal Udyan, Ayyappa Temple ,Silvassa, Tapovan Tourist Complex, Bindrabin are the major tourist attractions.

Daman and Diu

Capital: Daman
Administrator: Ashish Kundra
Area: 102 sq.km (39 sq mi)
Language: English, Gujarati, Hindi, Marathi
Date of establishment: 30 May 1987
Population: 242,911
Sex Ratio: 618 females per 1000 males
Literacy Rate: 87.07%
Population Density: 2169 per sq.km
Industry: Major industries include distillery, fishing andtourism
Neighbouring states: Gujarat
Tribes: Dhodia, Dubla (Halpati), Naikda (Talavia), Siddi, Varli.

Lakshadweep

Capital: Kavaratti
Largest city: Androtti
No. Of districts: 1
Administrator: H. Rajesh Prasad
Area: 32 sq.km (12 sq mi)
Language: English, Malayalam
Date of establishment: 1st November 1956
Population: 65,473
Sex Ratio: 946 females per 1000 males
Literacy Rate: 92.28%
Population Density: 2013 per sq.km
Agriculture: fishing and coconut cultivation
Industry: Fisheries, production of fibre products, tourism and desalination are major industries
Neighbouring states: Kerala and Karnataka
Art & Culture: Festivals: Eid-Ul-Fitr, Muharram, Bakra Eid and Milad-Un-Nabi are the most celebrated festivals.
Tourism: Bangaram and Kadmat islands are the most frequented tourist destinations.
Animal: Butterfly fish (Chaetodon *decussatus*)
Bird: House Sparrow (Passer domesticus)
Bird: Soofy Tern (onychoprion *fuscata*)

National Capital Territory of Delhi

Capital: New Delhi
No. Of districts: 11
Chief Minister: Arvind Kejriwal
Area: 1,484.0 sq.km(573.0 sq mi)
Language: Hindi, Punjabi, Urdu
Date of establishment: 1st Feb 1992
Population: 11,007,835
Sex Ratio: 866 females per 1000 males
Literacy Rate: 86.34%
Population Density: 11,297 per sq. km
Industry: Information technology, sports goods, medicines, leather goods, telecommunications, hotels, banking, media and tourism

Neighbouring states: Haryana and Uttar Pradesh
Art & Culture: Festivals: Diwali (the festival of lights), Mahavir Jayanti, Guru Nanak's Birthday, Raksha Bandhan, Durga Puja, Holi, Lohri, Krishna Janmastami, Maha Shivratri, Eid ul-Fitr, Moharram and Buddha Jayanti.
Tourism: Red Fort, Qutab Minar, Humayun's Tomb, India Gate, Jantar Mantar, Laxminarayan temple, Akshardham temple, Lotus temple, Iskcon temple, Safdarjung's Tomb, and Jama Masjid are the prominent tourist attractions.
Cuisines: Chaat, Tandoori Chicken, Paranthe, Chole Bhature
Bird: House Sparrow (Passer *domesticus)*

Puducherry

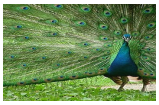
Capital & Largest city: Pondicherry
No. Of districts:4
Chief Minister: N. Rangaswamy
Area:492 sq.km (190 sq mi)
Language: French, Malayalam, Tamil, Telugu
Date of establishment:7 Jan 1963
Population:1,244,464
Sex Ratio:1,038 females per 1000 males
Literacy Rate:86.34%
Population Density:2,500/sq.km (6,600/sq mi)
Agriculture: Rice, pulses, sugarcane, coconuts, and cotton
Industry: Fisheries, textile, automobile parts, computer hardware, cotton yarn and tourism are the major industries.
Tourism: Promenade Beach, Sri Aurobindo Ashram, Auroville Beach, Serenity Beach, French War Memorial, 19th Century Light House, Bharathi Park, Governors Palace, Romain Rolland Library, Legislative Assembly, Pondicherry Museum, Thirukaameeswarar Temple and many more are the famous tourist spots in Puducherry.
Cuisines: Kadugu yerra, Vendakkai, Patchaddy
Animal: Squirrel Sciuridae *ratufinae*
Bird: Asian Koel (Eudynamys *scolopaceus*)

Four Ends of India

Easternmost point of India is known as Kibithu; situated on right bank of river Lohit separating India from China-Tibet region. It is a small village with the population at the altitude of 3,350 metre in Arunachal Pradesh. **Westernmost point** is situated in Kuch area of Gujarat called as Ghuar Mota. The region is famous for its harsh climate with 45°C in summer and 20°C in winter. During monsoon season this region looks like tortoise surrounded by seawater. **Northernmost** point of India has been in controversies ever since India's independence. The Siachen Glacier in the state of J&K is the northern boundary of India according to the official division of India during the time of Independences. The **Southernmost** point of the mainland of India is Kanyakunar District in the state of Tamil Nadu. Kanniyakumari, formerly was known as Cape Comorin. It is the second largest and urbanized of Tamil Nadu. Indira Point is a village in the Nicobar district of Andaman and Nicobar Islands, India. It is located in the Great Nicobar tehsil. It is the location of the southernmost point of India's territory.

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National Symbols of India

National Flag		The national flag consists of a horizontal rectangular tricolour with saffron at the top, white in the middle and India green at the bottom. The centre has a navy blue wheel with twenty-four spokes, known as the Ashoka Chakra. The flag is designed by Pingali Venkayya.
National Emblem	 सत्यमेव जयते	The national emblem is the Lion Capital of Asoka at Sarnath which was adopted on 26th January 1950. The motto inscribed on the emblem is in Devana gari script: "Satyameva jayate" which means Truth Alone Triumphs.
National Anthem	Jana Gana Mana	The anthem was composed by Rabindranath Tagore; adopted by the Constituent Assembly 24th January 1950.
National Song	Vande Mataram	Vande Mataram was composed by Bankim Chandra Chatterjee. It was adopted as the National song of India in 1950.
National Flower		Indian lotus is the national flower. It is the representation of purity as it remains flawless despite growing in mud and water.
National Fruit		Mango, also known as the 'King of Fruits', is the National Fruit of India.
National River		Ganga is the national river of India. It is also the longest river of the country.
National Tree		The Indian Banyan (Ficus bengalensis) is the national tree.
National Bird		Indian peacock (Pavo cristatus) is the national bird of India.
National Animal		The Tiger known as the Lord of the Jungle is the national animal of India.
National Calendar	Saka calendar	Saka calendar was introduced as the National calendar by the Calendar Committee in 1957.

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SPACE SCIENCE

Space mission 1975-2015		
Satellite	**Launch Date**	**Launch Vehicle**
Aryabhata	19-Apr-75	u-11 Interkosmos
Bhaskara-I	7-Jun-79	C-1 Interkosmos
Rohini Technology Payload	10-Aug-79	SLV-3
Rohini RS-1	18-Jul-80	SLV-3
Rohini RS-D1	31-May-81	SLV-3
Ariane Passenger Payload Experiment	19-Jun-81	Ariane-1 (V-3)
Bhaskara -II	20-Nov-81	C-1 Intercosmos
INSAT-1A	10-Apr-82	Delta 3910 PAM-D
Rohini RS-D2	17-Apr-83	SLV-3
INSAT-1B	30-Aug-83	Shuttle [PAM-D]
Stretched Rohini Satellite Series (SROSS-1)	24-Mar-87	ASLV
IRS-1A	17-Mar-88	Vostok
Stretched Rohini Satellite Series (SROSS-2)	13-Jul-88	ASLV
INSAT-1C	21-Jul-88	Ariane-3
INSAT-1D	12-Jun-90	Delta 4925
IRS-1B	29-Aug-91	Vostok
INSAT-2DT	26-Feb-92	Ariane-44L H10
Stretched Rohini Satellite Series (SROSS-C)	20-May-92	ASLV
INSAT-2A	10-Jul-92	Ariane-44L H10
INSAT-2B	23-Jul-93	Ariane-44L H10+
IRS-1E	20-Sep-93	PSLV-D1
Stretched Rohini Satellite Series (SROSS-C2)	4-May-94	ASLV
IRS-P2	15-Oct-94	PSLV-D2
INSAT-2C	7-Dec-95	Ariane-44L H10-3
IRS-1C	29-Dec-95	Molniya
IRS-P3	21-Mar-96	PSLV-D3
INSAT-2D	4-Jun-97	Ariane-44L H10-3
IRS-1D	29-Sep-97	PSLV-C1
INSAT-2E	3-Apr-99	Ariane-42P H10-3
Oceansat-1 (IRS-P4)	26-May-99	PSLV-C2
INSAT-3B	22-Mar-00	Ariane-5G
GSAT-1	18-Apr-01	GSLV-D1
Technology Experiment Satellite (TES)	22-Oct-01	PSLV-C3
INSAT-3C	24-Jan-02	Ariane-42L H10-3
Kalpana-1 (METSAT)	12-Sep-02	PSLV-C4
INSAT-3A	10-Apr-03	Ariane-5G
GSAT-2	8-May-03	GSLV-D2
INSAT-3E	28-Sep-03	Ariane-5G
RESOURCESAT-1 (IRS-P6)	17-Oct-03	PSLV-C5
EDUSAT	20-Oct-04	GSLV-F01

HAMSAT	5-May-05	PSLV-C6
CARTOSAT-1	5-May-05	PSLV-C6
INSAT-4A	22-Dec-05	Ariane-5GS
INSAT-4C	10-Jul-06	GSLV-F02
CARTOSAT-2	10-Jan-07	PSLV-C7
Space Capsule Recovery Experiment (SRE-1)	10-Jan-07	PSLV-C7
INSAT-4B	12-Mar-07	Ariane-5ECA
INSAT-4CR	2-Sep-07	GSLV-F04
CARTOSAT-2A	28-Apr-08	PSLV-C9
IMS-1 (Third World Satellite – TWsat)	28-Apr-08	PSLV-C9
Chandrayaan-1	22-Oct-08	PSLV-C11
RISAT-2	20-Apr-09	PSLV-C12
ANUSAT	20-Apr-09	PSLV-C12
Oceansat-2 (IRS-P4)	23-Sep-09	PSLV-C14
GSAT-4	15-Apr-10	GSLV-D3
CARTOSAT-2B	12-Jul-10	PSLV-C15
StudSat	12-Jul-10	PSLV-C15
GSAT-5P / INSAT-4D	25-Dec-10	GSLV-F06
RESOURCESAT-2	20-Apr-11	PSLV-C16
Youthsat	20-Apr-11	PSLV-C16
GSAT-8 / INSAT-4G	21-May-11	Ariane-5 VA-202
GSAT-12	15-Jul-11	PSLV-C17
Megha-Tropiques	12-Oct-11	PSLV-C18
Jugnu	12-Oct-11	PSLV-C18
RISAT-1	26-Apr-12	PSLV-C19
SRMSAT	26-Apr-12	PSLV-C18
GSAT-10	29-Sep-12	Ariane-5 VA-209
SARAL	25-Feb-13	PSLV-C20
IRNSS-1A	1-Jul-13	PSLV-C22
INSAT-3D	26-Jul-13	Ariane-5
GSAT-7	30-Aug-13	Ariane-5
Mars Orbiter Mission (MOM)	5-Nov-13	PSLV-C25
GSAT-14	5-Jan-14	GSLV-D5
IRNSS-1B	4-Apr-14	PSLV-C24
IRNSS-1C	10-Nov-14	PSLV-C26
GSAT-16	7-Dec-14	Ariane-5
IRNSS-1D	28-Mar-15	PSLV-C27
GSAT-6	27-Aug-15	GSLV-D6
Astrosat	28-Sep-15	PSLV-C30
GSAT-15	11-Nov-15	Ariane 5 VA-227

Space Centres and Units

- Vikram Sarabhai Space Centre (VSSC) - Thumba (Thiruvananthapuram)
- ISRO Satellite Centre (ISAC) - Bengaluru
- SHAR Centre - Shriharikota (Andhra Pradesh)
- Liquid Propulsion Systems Centre (LPSC) - Bengaluru
- Space Application Centre - Ahemdabad

- Developmental and Educational Communication - Ahmedabad unit (DECU)
- ISRO Telemetry Tracking and Command Network (ISTRAC) - Bengaluru
- National Remote Sensing Agency (NRSA) - Hyderabad
- Master Control Facility (MCF) - Hassan (Karnataka)
- The Antrix Corporation Limited - Bengaluru
- North Eastern-Space Applications Centre (NE-SAC) - Shillong
- Physical Research Laboratory (PRL) - Ahmedabad

Indian Remote Sensing (IRS) Satellite System

The Indian Remote Sensing (IRS) satellite system is one of the largest constellations of remote sensing satellites in operation in the world today. The IRS programme commissioned with the launch of IRS-1A in 1988 presently includes eleven satellites that continue to provide imageries in a variety of spatial resolutions ranging from better than one metre upto 500 metres.

Indian Regional Navigation Satellite System

The new of Navigation Satellite system was launched in 2013 aimed at providing accurate real time positioning and timing services over India and its surroundings upto a range of 1500 km. The fully deployed system consists of 3 satellites in GEO orbit and 4 satellites in GSO orbits placed approximately at an attitude of 36000 km. The constellation has total 7 satellites.

Mars Orbiter Mission is a space probe, launched on 24 September, 2014. The mission focuses on developing the technologies for designing, planning, management and operations of an interplanetary mission. The probe carries five instruments for gathering knowledge about Mars. The space craft is now jointly monitored by ISRO Telemetry, Tracking and Command Network (ISTRAC) in Bangalore, and Indian Deep Space Network antennae at Byalalu.

GLOBAL SPACE PROBES

- **Venus :**
  Venera 1 – USSR Venus flyby, Feb 12, 1961; Now in a solar orbit.
  Mariner 2 – USA Venus flyby, Aug 27, 1962; Now in a solar orbit.
  Magellan – USA Venus orbiter, May 4, 1989 – 1994
- **Mars :**
  Mariner 3 – USA Mars flyby, Nov. 5, 1964.
  Viking 1 – USA Mars orbiter/ Lander, Aug 20,1975.
  Phobas 1 – USSR Mars orbiter/ Lander, July 7, 1988.
  Mars Odyssey – USA Mars orbiter, Apr. 7, 2001
  Spirit (MER-A) – USA Mars Rover, June 10, 2003
  Opportunity (MER-B) – USA Mars Rover, July 7, 2003.
  Mars Phoenix Lander – USA Mars Lander, Aug. 4, 2007.
- **Jupiter :**
  Galileo – USA and Europe probe, Oct. 18, 1989.
  Hubble space Telescope – USA and Europe, Apr. 25, 1990.

New Horizons – USA Kuiper belt flyby, Jan. 19, 2006.

- **Moon :**
  Pioneer O – USA Lunar orbiter, Aug. 17, 1958.
  Apollo 17 – USA manned lunar lander, Dec. 7, 1972
  Chang'e – 1 – China's lunar orbiter, Oct 24, 2007.
  Chandrayaan 1 – India PSLV – C 11, Oct 22, 2008. India's first moon mission and the cheapest moon mission in the world.

DEFENCE AND SECURITY

The Republic of India has world's 3rd largest military force and has the world's largest volunteer army. The President of India is the Supreme Commander of the Indian Armed Forces and is looked after by the Ministry of Defence (MoD) is led by the Union Cabinet Minister of Defence. It consists of three professional uniformed services: the Indian Army, Indian Navy, and Indian Air Force.

The President of India is the Supreme Commander of the Armed Force. However, the Cabinet is responsible for National Defence. The Administrative control of armed forces is exercised by the Ministry of Defence, which constitutes the following.

(a) Department of Defence
(b) Department of Defence Production and Supplies
(c) Department of Defence Research and Development (DDRD).

Army

Headed by Chief of the Army Staff

Headquarters New Delhi

Further, the three services Headquarters, which were used to be attached offices of Ministry of Defence are now integrated with the Ministry and known as Integrated Headquarters of the Ministry of Defence.

Number of Commands		
	Command	***Headquarter***
1.	Western Command	Chandimandir
2.	Eastern Command	Calcutta
3.	Northern Command	Udhampur
4.	Southern Command	Pune
5.	Central Command	Lucknow
6.	Training Command (added in 1991)	Mhow
7.	South Western Command (added in 2005)	Jaipur

Air Force

Headed By Chief of the Air Staff

Headquarters New Delhi

Number of Command		
	Command	***Headquarter***
1.	Western Air Command	Delhi
2.	South-Western Air Command	Gandhinagar
3.	Central Air Command	Allahabad
4.	Eastern Air Command	Shillong
5.	Southern Air Command	Thiru-vanathapuram

In addition to the above main command, there are two support commands, or functional commands, namely:

1. Training Command – Bangalore
2. Maintenance Command – Nagpur

Today, the Air Force has an array of modern aircraft on its inventory besides other hi-tech electronic and support

equipment. The aircraft fleet consists of fighter-bombers, air-superiority fighters, interceptors, transport, and logistic aircraft and helicopters.

Navy

Headed by Chief of Naval Staff
Headquarters New Delhi

Number of Commands		
	Command	*Headquarter*
1.	Western Naval Command	Mumbai
2.	Eastern Naval Command	Visakhapatnam Operational command
3.	Southern Naval Command	Kochi used for training

Each command is commanded by a flag officer commanding- in-chief.

The Indian Navy is a well-balanced three-dimensional force consisting of sophisticated missile-capable warships, aircraft carriers, minesweepers, advanced submarines, and the latest aircraft in its inventory. At present, the Navy has two major Naval bases at Mumbai and Visakhapatnam. Goa and Arkonnam are the major Naval air bases.

IMPORTANT SUBMARINES/ MISSILE BOATS/WARSHIPS

Submarines	Warships	Missile Boats
INS Chakra	INS Savitri	INS Vibhuti
INS Shahkul	INS Delhi	INS Prahar
INS Shalki	INS Mysore	INS Prashant
INS Sindhushastra	INS Brahamputra INS Ghariyal INS Kulish INS Satpura INS Talwar INS Tillanchang	INS Nashak INS Vipul

Location of Defence Establishments

Army

Indian Military Academy	Dehradun
The College of Military Engineering	Kirkee (Pune)
The School of Signals	Mhow
The Infantry School	Mhow
The Corps of Military Police Centre and School	Faizabad
The Army Education Corps and Training College	Pachmarhi

Navy

Indian Naval Academy	Kochi
Naval Air Station Garuda	Kochi
INS Agrani (Petty Officer's School)	Coimbatore
Naval Gunnery School	Kochi
Torpedo Anti-Submarine School	Kochi
Navigation Direction School	Mormugao

Air Force

Pilot Training Establishment	Allahabad
Jet Training and Transport Training Wings, Air Force Station	Hyderabad
The Air Force Technical Training College	Jalahalli

Paratroopers Training School	Agra

Inter-services Institutes

National Defence Academy	Khadakvasla
National Defence College	New Delhi
Defence Services Staff College	Wellington
School of Land/Air Warfare	Secunderabad
Rashtriya Indian Military College	Dehradun
Armed Forces Medical College	Pune

DRDO

It was established in 1958 by amalgamating Defence Science Organization and some of the Technical Development Institutions. It functions under the control of Scientific Adviser to Defence Minister who is also secretary, Defence R&D. DRDO formulates and executes programmes of scientific research, design and development leading to induction of state-of-the-art weapons, platforms, and other equipment required by the Armed Forces. It is engaged in the pursuit of self-reliance in critical technologies of relevance to national security.

The major achievements towards indigenous development of defence weapons and systems are (i) development leading to production of surface-to-surface missile, Prithvi; (ii) state-of-the-art MBT, Arjun; (iii) flight simulators for aircraft; (iv) pilotless target aircraft, Lakshya; (v) parallel super-computer; and (vi) the submarine sonar and weapon control system, Panchendriya.

Indian (Space Research Organisation (ISRO)) is the parented agency of Indian space agencies which was established on 15th August 1969. The head quater of this organisation is at Bangalore and it was founded by Vikram Sarabhai with a vision to harness space technology for national development, while pursuing space science research and planetary exploration. The first satellite made by ISRO was Aryabhata and it was launched by Russia on 19th April 1975. Thereafter it has developed numerous satellites and spacecrafts for serving different technology such as communication Earth's observation, navigation, climatic observations etc.

RANKS OF INDIAN ARMY, NAVY & AIR FORCE

Indian Army	Indian Navy	Indian Air Force
Field Marshal	Admiral of the Fleet	Marshal of the Air Force
General	Admiral	Air Chief Marshal
Lieutenant General	Vice Admiral	Air Marshal
Major General	Rear Admiral	Air Vice Marshal
Brigadier	Commodore	Air Commodore
Colonel	Captain	Group Captain
Lieutenant Colonel	Commander	Wing Commander
Major	Lieutenant Commander	Squadron Leader
Captain	Lieutenant	Flight Lieutenant
Lieutenant	Sub-Lieutenant	Flying Officer

Indian Costal Guard (ICG)

Indian Costal Guard (ICG) protects India's maritime interests and enforces maritime law, with jurisdiction over the territorial waters of India, including its contiguous zone and exclusive economic zone. The Indian Coast Guard was

formally established on 18 August 1978 by the Coast Guard Act, 1978. The Coast Guard works in close cooperation with the Indian Navy, the Department of Fisheries, the Department of Revenue (Customs) and the Central and State police forces.

There are **five coastal regions**: Western Region (W) Mumbai; Eastern Region (E) Chennia; North Eastern Region (NE) Kolkata; North Western Region (NW) Ghandhinagar.

Paramilitary Forces:

1. **Railway Protection Force (RPF) (1861)**
   Mission
- Protect and safeguard railway passengers, passenger area and railway property.
- Ensure the safety, security and boost the confidence of the traveling public in the Indian Railways

2. **Central Reserve Railway Protection Force (CRPF) (1949)– Mission:**
- Crowd control
- Riot control
- Counter Millitancy / Insurgency operations.
- Dealing with Left Wing Extremism
- Overall co-ordination of large scale security arrangement specially with regard to elections in distrubed areas.
- Protection of VIPs and vital installations.
- Checking environmental degradation and protection of local Flora and Fauna
- Fighting aggression during War time
- Participating in UN Peace Keeping Mission
- Rescue and Relief operations at the time of Natural Calamity.

3. **Border Security Force (BSF) (1965)**
   Mission
- Promote a sense of security among the people living in the border areas.
- Prevent trans border crimes, unauthorized entry into or exit from the territory of India.
- Prevent smuggling and any other illegal activity.
- Holding ground in less threatened sectors so long as the main attack does not develop in a particular sector and it is felt that the local situation is within the capability of BSF to deal with.
- Protection of vital installations particular air-fields against enemy commandoes/para troopers or raids.
- Providing extension to the flanks of main defence line by the holding of strong points in conjunction with other units.
- Limited Aggressive action against para military or irregular forces of the enemy within the overall plan of the Armed Forces.
- Acting as guides in an area of responsibility where routes are known.
- Guarding of prisoners of war cages.
- Assistance in control of refugees.
- Anti-infiltration duties in specified area.

4. **Central Industrial Security Force -CPF. (1969)–**

Mission
- Providing total security solutions.
- Exposure to varied security environments ranging from highly disturbed areas in J&K, North East and Andhra Pradesh to mafia infested coalfields of Jharkhand and West Bengal.

- Rich experience in security and protection of highly sensitive establishments, Airports and Centres of economic growth.
- Protection of heritage monuments like Taj Mahal.
- Only Force to have a full-fledged Fire Wing comprising highly trained personnel.
- Extensive use of latest security gadgets.
- Excellent training infrastructure.

5. Sashastra Seema Bal (SSB) (1969)–

Mission

- To promote sense of security among the people living in the border area.
- To prevent trans-border crimes and unauthorized entries into or exit from the territory of India.
- To prevent smuggling and other illegal activities.

6. Indo-Tibetan Border Police (ITBP) (1962)–

Mission

- Vigil on the northern borders, detection and prevention of border violations, and promotion of the sense of security among the local populace.
- Check illegal immigration, trans-border smuggling and crimes.
- Security to sensitive installations, banks and protected persons.
- Restore and preserve order in any area in the event of disturbance.

Special Security Forces

Anti Terrorist Squad (1990) –

- A unit of government of Maharashtra to tackle menace and terrorism in collaboration with RAW and IB.
- Aims at tracking and neutralizing activities of terror-groups , mafia and other organized crime syndicates, and detecting rackets of counterfeit currency notes and smuggling of narcotic substances.

Intelligence Bureau(IB) (1887) –

- A unit of India's internal intelligence agency
- Tasked with intelligence collection in border areas along with domestic intelligence responsibilities

Assam Rifles (1853)

- A unit of paramilitary forces
- Aims at combating counter insurgency, civil unrest,terrorism, special weapons operations.

Garud Commando Force (2004)–

- A special unit of the Indian Air Force
- Garuds perform both war and peace time duties such asrescuing downed airmen and other forces from behind enemy lines,suppression of enemy of air defense,provide support to other air operations,protecting the air bases and other vital infrastructure ,counter terrorism, anti-hijacking, hostage rescue, aid during natural calamities and military tasks in the interest of the nation

Ghatak Force

- A special unit of the an infantry battalion in the Indian Army
- Performs task such as special reconnaissance, raids on enemy artillery positions, airfields, supply dumps and tactical headquarters.

Rapid Action Force (1991) –

- A specialized wing of the Indian CRPF (Central Reserve Police Force).

- They are trained to deal with riots, riot like situations, crowd control, rescue and relief operations, and related unrest.

National security Guard (1984) –

- It is a as a Federal Contingency Deployment Forceunder the Ministry of Home Affairs (MHA).
- Aimed at performing counter hijacking tasks on land, sea, and air, bomb disposal (search, detection and neutralization of IEDs), Post Blast Investigation and hostage rescue

National Investigation Agency (2009) –

- A federal agency established by the Indian Government.
- It aims at creating prevention for existing and potential terrorist groups/individuals alongside developinga storehouse of all terrorist related information.

Marcos (1907) –

- A special force unit of Indian Navy. It is created to conduct special operations such as amphibious warfare, counter-terrorism, direct action, special reconnaissance, unconventional warfare, hostage rescue, personnel recovery, combat search and rescue, asymmetric warfare, foreign internal defense, counter proliferation.

Research and Analysis Wing (RAW) (1968) –

- It's a primary foreign intelligence agency of India.
- Aims at monitoring political, military, economic and scientific developments in countries which have direct bearing on India's national security and the formulation of its foreign policy,coveting operations to safe guard India's National interests,moulding international public opinion with the help of the strong and vibrant Indian Diaspora, performing Anti Terror Operations and neutralizing terror elements posing a threat to India.

Commando Battalion for Resolute Action (COBRA) (2008) –

- It's a specialized unit of the CRPF created to counter the Naxalite problem in India.
- They are specially trained in guerilla warfare to tackle the notorious naxalite groups in the country. They also master the techniques of camouflage, jungle warfare, parachute jumps, precision strikes and ambushes.

INDIA'S MISSILE SYSTEM : AT A GLANCE

S. No.	Missile	Feature	Range
1	Astra Missile	Beyond Visual range air-to-air Missile	A range of over 80 km in head on mode and 20 km in tail-chase mode.
2	Shourya Missile	Canisterised Surface-to-surface missile	600 km
3	Sagarika Missile (K-15)	Submarine-to-Surface Missile	More than 700 km
4	Akash Missile	Medium range Surface-to-Air Missile	25 km

5	Nag Missile	Third Generation-fire and forget-anti-tank guided missile	4 to 6 km
6	Nirbhay Missile	Long range subsonic cruise missile	1000 km
7	Dhanush Missile	The Ship-based Surface-to-surface ballistic missile	300 to 350 km
8	Brahmos Missile (Joint Indo-Russia Venture)	Supersonic cruise missile (can be launched from ships, submarines, aricrafts and land)	290 km
9	(a) Prithvi-I (Army version)	A single stage liquid-fuelled surface-to-surface missile.	150 km
	(b) Prithivi-II (Air force version)	A single stage liquid-fuelled surface-to-surface missile.	250 km
	(c) Prithvi-III (Naval Version)	A two-stage surface-to-surface missile (first stage is solid fuelled and second stage is liquid fuelled).	350 km
10	(a) Agni-I	Short range ballistic missile	700-800 km
	(b) Agni-II	Medium range ballistic missile	2500 km
	(c) Agni-III	Intermediate range ballistic missile	3500 km
	(d) Agni-IV	Intermediate	4000 km
	(e) Agni-V	Range ballistic missile	5500-5800 km
	(f) Agni-VI (tested)	undu development	600-800 km

TANKS IN INDIA

Type	Quantity (Est.)	Origin	Description
Arjun MBT	248	India	The Indian Army ordered 124 'Arjun' Mk1 MBTs in 2000 and placed another order for additional 124 'Arjun' Mk1 MBTs and 124 'Arjun' Mk2 MBTs in 2010, after Arjun tank had conclusively outperformed the T-90. Indian Army is set to acquire 124 Arjun Mk2 tanks as a follow-on order, according to the Defence Minister.
T-90	1,050	Russia	Procured in three separate orders. Two batches (310 tanks and knockdown kits in 2000 and a further 300 in 2006) were purchased from Russia. A further 1000 were to be produced locally by 2020. Of those, the first batch of 10 were delivered in August 2009.
T-72	2,414	Soviet Union, Poland	Upgraded to advanced Ajeya Mk1 and MK2 standard mainly based on Polish PT-91 Twardy Tank features developed by DRDO

INDIAN SEA-BASED NUCLEAR-ARMED BALLISTIC MISSILES

Name	Type	Maximum range (km)	Status
Dhanush	Short-range	350	Developed, but not deployed
Sagarika (K-15)	SLBM	700	Awaiting deployment on INS
K-4	SLBM3	500	Tested

NUCLEAR-POWERED SUBMARINES

Class	Type	Boats	Displacement	Note
Chakra (Akula II)-class	Attack submarine (SSN)	INS Chakra (S71)	12,770 tonnes	Under a 10 year lease from Russia since 2012.
Arihant-class	Ballistic Missile sub marine (SSBN)	INS Arihant (S73)	6,000 tonnes, surfaced	Undergoing sea trials, expected to be commissioned by 2014-2015.

AIRCRAFT CARRIERS

Class	Type	Ships	Displacement	Description
Centaur -class	Aircraft carrier	INS Viraat (R22)	28,700 tonnes	STOVL carrier. Scheduled to be decommissioned by 2018 and replaced by INS Vikrant
Modified Kiev-class	Aircraft carrier	INS Vikramaditya (R33)	45,400 tonnes	STOBAR carrier.

REPLENISHMENT SHIPS

Class	Type	Ships	Origin	Displacement
Deepak-class	Replenishment oiler	INS Deepak (A50) INS Shakti (A57)	Italy	27,500 tonnes
Jyoti-class	Replenishment oiler	INS Jyoti (A58)	Russia	35,900 tonnes
Aditya-class	Replenishment oiler & Repair ship	INS Aditya (A59)	India	24,612 tonnes

RESEARCH AND SURVEY VESSELS

Class	Type	Ships	Displacement
Sagardhwani	Research vessel	INS Sagardhwani (A74)	2,050 tonnes
Sandhayak-class	Survey vessel	INS Nirupak (J14) INS Investigator (J15) INS Jamuna (J16)INS Sutlej (J17) INS Sandhayak (J18) INS Nirdeshak (J19) INS Darshak (J20) INS Sarvekshak (J22)	1,800 tonnes
Makar-class	Survey vessel	INS Makar (J31)	500 tonnes

ATOMIC & NUCLEAR SCIENCE

ATOMIC RESEARCH

India's atomic research programme is committed to peaceful uses only, for example, atomic power, generation of electricity, development of agriculture and industry, medical science application, etc.

Indian's journey to atomic energy research started with establishment of the Atomic Energy Commission on 10 August 1948 under the chairmanship of Dr. Homi J. Bhabha. Subsequently, DAE was established in 1956 with the following mandate:

(a) To generate safe, economic electrical power from nuclear energy.
(b) To build research reactors and to utilize the radioisotopes produced in these reactors for applications in the field of agriculture and medicine.
(c) To develop advanced technology in areas such as accelerators, lasers, biochemistry, information technology, and materials including development of non-nuclear and strategic materials like titanium.

First Nuclear Implosion

Carried out on 18 May 1974 at pokhran to Rajasthan (Thar) desert. The main objective was use of atomic energy for peaceful purposes, that is, digging canals, reservoirs, oil explorations as well as to study rock dynamics. This successful implosion made India the sixth nuclear nation in the world.

Bhabha Atomic Research Centre (BARC) Established in 1957, it is located at Trombay (Maharashtra), and is India's largest atomic research centre, for R&D.

(a) **BARC's atomic reactors Aspara** India's atomic reactor was commissioned on 4 August 1956. One megawatt swimming pool type reactor produces radio isotopes. It is also the first atomic reactor in Asia.
(b) **Cirus** (canada India Reactor) Built in 1960, it is a 40 MW reactor.
(c) **Zerlina** (Zero Energy Reactor for Lattice Investigation and New Assemblies) Commissioned on 4 January 1961, used for studies of uranium heavy water lattice.
(d) **Dhruva** Commissioned on 15 August 1984, this 100 MW reactor is a completely indigenous nuclear reactor with most advanced laboratories in the world.
(e) **Purnima - I** (Plutonium Reactor for Neutronic Investigation in Multiplying Assemblies) commissioned on 22 May 1972, a plutonium fuelled reactor, modified as *Purnima*-II that used uranium as fuel and it is being further modified as *Purnima*-III.
(f) **Kamini** India's first fast breeder neutron reactor, it has been set up at Kalpakkam. Today.

Nuclear power plants

Nuclear power is the fourth-largest source of electricity in India after thermal, hydroelectric and renewable sources of electricity. India has 21 nuclear reactors in operation in 7 nuclear power plants, having an installed capacity of 5308 MW and producing a total of 30,292.91 GWh of electricity while seven other reactors are under construction and are expected to generate an additional 6,100 MW.

POWER STATION IN INDIA

Power station	Operator	Establishment Date	Location	State
Tarapur Atomic Power Station	NPCIL	1969	Tarapur	Maharashtra
Rajasthan Atomic Power Station	NPCIL	1973	Rawatbhata	Rajasthan
Kakrapar Atomic Power Station	NPCIL	1993	Kakrapar	Gujarat
Kudankulam Nuclear Power Plant	NPCIL	2013	Kudankulam	Tamil Nadu
Kaiga Nuclear Power Plant	NPCIL	2000	Kaiga	Karnataka
Madras Atomic Power Station	NPCIL	1984	Kalpakkam	Tamil Nadu
Narora Atomic Power Station	NPCIL	1991	Narora	Uttar Pradesh
Gorakhpur Atomic Power Station	NPCIL		Fatehabad	Haryana
Talcher Super Thermal Power Station	NTPC	1995	Kaniha	Odisha
Sipat Thermal Power Plant	NTPC	2008	Sipat	Chhattisgarh
Vindhyachal Super Thermal Power Station	NTPC	2013	Singrauli	Madhya Pradesh
Mundra Ultra Mega Power Project	Tata Power	2009	Mundra	Gujarat
Korba Super Thermal Power Plant	NTPC	1983	Jamani Palli	Chattish Gahr
Bhusawal Thermal Power Station	MAHAGENCO	1968	Deepnagar	Maharastra
Satpura Thermal Power Station	MPPGCL	1967	Sarni	Madhya Pradesh
Sterlite Jharsuguda Power Station	Vedanta	2006	Jharsuguda	Odisha
Durgapur Thermal Power Station	DVC	1996	Durgapur	West Bengal

FIRST IN MALE

First governor of Bengal	Lord Clive(1757-60)
Last governor of Bengal	Warren Hastings(1772-74)
The first British Governor General of Bengal	Lord Warren Hasting(1774-1885)
The first British Governor General of India	Lord William Bentinck(1833-1835)
The first British Viceroy of India	Lord Canning(1856-62)
The first Governor General of free India	Lord Mountbatten(1947-1948)

The first and the last Indian to be Governor General of free India	C. Rajgopalachari(1948-1950)
The first President of Indian Republic	Dr. Rajendra Prasad
The first Prime Minister of free India	Pt. Jawahar Lal Nehru
The first Indian to win Nobel Prize	Rabindranath Tagore
The first President of Indian National Congress	W.C. Banerjee
The first Muslim President of Indian National Congress	Badruddin Tayyabji
The first Muslim President of India	Dr. Zakir Hussain
The first man who introduced printing press in India	James Hicky
The first Indian to join the I.C.S	Satyendra Nath Tagore
India's first man in Space	Rakesh Sharma
The first Prime Minister of India who resigned without completing the full term	Morarji Desai
The first Indian Commander-in-Chief of India	General Cariappa
The first Chief of Army Staff	Gen. Maharaj Rajendra Singhji
The first Indian Member of the Viceroy's executive council	S.P.Sinha
The first President of India who died while in office	Dr. Zakhir Hussain
The first Muslim President of Indian Republic	Dr. Zakhir Hussain
The first Prime Minister of India who did not face the Parliament	Charan Singh
The first Field Marshal of India	S.H.F. Manekshaw
The first Indian to get Nobel Prize in Physics	C.V.Raman
The first Indian to receive Bharat Ratna award	Dr. Radhakrishnan
The first Indian to cross English Channel	Mihir Sen
The first Person to receive Jnanpith award	Sri Shankar Kurup
The first Speaker of the Lok Sabha	Ganesh Vasudeva Mavalankar
The first Vice-President of India	Dr. Radhakrishnan
The first Education Minister	Abdul Kalam Azad
The first Home minister of India	Sardar Vallabh Bhai Patel
The first Indian Air Chief Marshal	S. Mukherjee
The first Indian Naval Chief	Vice Admiral R.D. Katari
The first Judge of International Court of Justice	Dr. Nagendra Singh
The first person to reach Mt. Everest without oxygen	Sherpa Anga Dorjee
The first person to get Param Vir Chakra	Major Somnath Sharma
The first Chief Election Commissioner	Sukumar Sen

The first person to receive Magsaysay Award	Acharya Vinoba Bhave
The first person of Indian origin to receive Nobel Prize in Medicine	Hargovind Khurana
The first Chinese traveller to visit India	Fa-hein
The first person to receive Stalin Prize	Saifuddin Kitchlu
The first person to resign from the Central Cabinet	Shyama Prasad Mukherjee
The first person to receive Nobel Prize in Economics	Amartya Sen
The first Chief Justice of Supreme Court	Justice Hirala J. Kania
The first Indian Pilot	J.R.D. Tata (1929)

FIRST IN FEMALE

The first lady to become Miss World	Rita Faria
The first woman judge in Supreme Court	Mrs. Meera Sahib Fatima Bibi
The first woman Ambassador	Miss C.B. Muthamma
The first woman Governor of a state in free India	Mrs Sarojini Naidu
The first woman Speaker of a State Assembly	Shanno Devi
The first woman Prime Minister	Mrs Indira Gandhi
The first woman Minister in a Government	Rajkumari Amrit Kaur
The first woman to climb Mount Everest	Bachhendri Pal
The first woman to climb Mount Everest twice	Santosh Yadav
The first woman President of Indian National Congress	Mrs Annie Besant
The first woman pilot in Indian Air Force	Harita Kaur Dayal
The first woman Graduates	Kadambini Ganguly and Chandramukhi Basu, 1883
The first woman Airline Pilot	Durga Banerjee
The first woman Honours Graduate	Kamini Roy, 1886
The first woman Olympic medal Winner	Karnam Malleswari, 2000
The first woman Asian Games Gold Medal Winner	Kamlijit Sandhu
The first woman Lawyer	Cornelia Sorabjee
The first woman President of United Nations General Assembly	Mrs Vijaya Laxmi Pandit
The first woman Chief Minister of an Indian State	Mrs Sucheta Kripalani
The first woman Chairman of Union Public Service Commission	Roze Millian Bethew
The first woman Director General of Police	Kanchan Chaudhary Bhattacharya
The first woman Judge	Anna Chandy (She became judge in a district court in 1937)
The first woman Cheif Justice of High Court	Mrs Leela Seth (Himachal Pradesh High Court)
The first woman Judge in Supreme Court of India	Kumari Justice M. Fathima Beevi

The first woman Lieutenant General	Puneeta Arora
The first woman Air Vice Marshal	P. Bandopadhyaya
The first woman chairperson of Indian Airlines	Sushma Chawla
The first woman IPS officer	Mrs. Kiran Bedi
The first and last Muslim woman ruler of India	Razia Sultan
The first woman to receive Ashoka Chakra	Nirja Bhanot
The first woman to receive Jnanpith Award	Ashapurna Devi
The first woman to cross English Channel	Aarti Saha
The first woman to receive Nobel Prize	Mother Teresa
The first woman to receive Bharat Ratna	Mrs Indira Gandhi
The first woman to receive Jnanpith Award	Ashapurna Devi

FIRST IN OTHERS

First Wax statue of a Living Indian	Mahatma Gandhi at Madame Tussaud's in 1939
First Exclusive internet magazine	Bharat Samachar
First Miss India to participate in Miss Universe	Indrani Rehman
First Judge in International Court of Justice	Dr. Nagender Singh
First Graduate in Medicine	Soorjo Coomar Goodeve Chukerbutty
India's First University	Nalanda University
India's First Open University	Andhra Pradesh Open University
India's First Lok Sabha Member to be elected with a record maximum number of votes	P.V.Narasimha Rao
First Indian to reach Antarctica	Lt. Ram Charan
First British to Visit India	Hawkins
First Test tube baby of India	Indira (Baby Harsha)
First Post Office Opened in India	Kolkata(1727)

SUPERLATIVES

Structures

- Highest Tower (Minaret) – Qutub Minar
- Higher Gateway – Buland Darwaza at Fatehpur Sikri near Agra. Built by Akbar (53.5 m /175 ft High)
- Highest Dam – Bhakra Dam
- Highest Bridge – Chenab Bridge
- Highest Airport- Leh Air Port in Ladakh (3256 m/ 16080 ft high)
- Highest Hydel Power Station- Rongtong Hydel Project in Kinnaur district of Himachal Pradesh.
- Highest Mountain Peak- Kanchenjunga
- Highest Road- Road at Khardungla in the Leh-Manali Sector
- Highest Waterfall- Jog Waterfall, Karnataka
- Largest Residence – Antilia Bhawan built by Mukesh Ambani
- Largest Cinema Hall – Prasad Max, Hyderabad

- Largest Museum – National Museum Delhi
- Largest River Barrage – Farakka Barrage
- Biggest Auditorium (Mumbai) – Sri Shanmukhanand Hall
- Largest zoo – Arignar Anna Zoological Park
- Largest Cave Temple – Ellora
- Largest Gurudwara – Golden Temple, Amritsar
- Largest Mosque – Jama Masjid, Delhi (built by Shah Jahan in 1644-58)
- Largest Man-made Lake – Govind Sagar (Bhakra)
- Largest Dome – Gol Gumbaz (Karnataka)
- Largest Cantilever Bridge – Howrah Bridge
- Longest Railway Tunnel- Pir Panjal Railway Tunnel (11 km)
- Longest Road Tunnel - 9.2 km long tunnel on Jammu-Srinagar National Highway
- Largest Public Sector Bank- State Bank of India
- Largest Botanical Garden - National Botanical Garden in Kolkata
- Largest Church- Se Cathedral at Old Goa, 10 km from Panaji.
- Largest Delta- Sunderbans (75,000 sq km) formed by the Ganga and Brahmaputra in West Bengal and Bangladesh
- Largest Stupa- Kesariya Stupa in Bihar
- Largest Library- National Library, Kolkata
- Largest Planetarium- Birla Planetarium, Kolkata.
- Largest Prison- Tihar Jail, Delhi
- Largest Concentration of Scheduled Tribes- Madhya Pradesh
- Largest Scheduled Caste-Community Santhal
- Longest River Bridge – Bandra-Worli sea link which is 5.6 km.
- Largest Corridor – Rameshwaram Temple Corridor
- Largest irrigation Canal-Indira Gandhi Canal or Rajasthan Canal (959 km long)
- Longest Dam-Hirakund Dam on Mahanadi river in Orissa (24.4 km long)
- Longest Glacier-Siachen Glacier on the Indo-pakistan border (75.6 km long and 2.8 km wide)
- Longest Railway Bridge Nehru Setu Bridge (4.62 km) long
- Fastest Train-Shatabdi Express between New Delhi and Bhopal at a speed of 140 kmph
- Tallest Light House – Jakhau, light hour, Gujarat
- Tallest Statues – Statue of Jain Saint Gomateswara at Sravanabelagola in Karnataka
- Tallest Chimber – Hanuman Swami statue with 135ft. tall.
- Oldest Church- St. Thomas Church at Palayar in Trichur district in Kerala built in 52 AD.
- Oldest Monastery- Buddhist Monastery, (situated at an altitude of 3,048 m /10,000 ft) at Tawang in Arunachal Pradesh.
- Largest mall- Lulu Mall Kochi
- Most Populous City- Mumbai

Natural

- Longest River – Ganges
- Largest Desert – Thar (Rajasthan)
- Largest Lake – Wular Rajasthan
- Largest Fresh Water Lake-Kolleru in Andhra Pradesh
- Largest Cave- Amarnath (about 44 km from Pahalgam in Jammu and Kashmir)

Founders of Indian Institutions

- Arya Samaj-Swami Dayanand Saraswathi
- Athmiya Sabha-Raja Ram Mohan Roy
- Brahma Samaj-Raja Ram Mohan Roy
- Deccan Education Society-

G.G.Agarkar, M.G.Ranade, V.G.Gibhongar
- Dharma Sabha-Radhakanthadev
- Indian Brahma Samaj-Keshav Chandra Sen
- Manavadharma Sabha-Durgaram Manjaram
- Prarthana Samaj-Athmaram Pandurang
- Pune Sewa Sadan-Smt.Remabhai Ranade, G.K.Devdhar
- Ramakrishna Mission-Swami Vivekananda
- Sadharan Brahma Samaj-Shivananda Sashtri, Anand Mohan Bose
- Servants of India Society-Gopalakrishna Gokhale
- Sewa Sadan-Bahuramji M.Malabari
- Sewa Samithi-H.N.Kunsru
- Social Service League-N.M.Joshi
- Thathwabodhini Sabha-Debendranatha Tagore
- Theosophical Society-Madam H.P.Blavadski, Col.H.L.Olkott

Leader of Nations-Famous Father

- America—George Washington
- Bangladesh—Mujibur Rehuman
- China—Sunyatsen
- India—Gandhiji
- Indonesia—Sukarno
- Mouritius—Ramgoolam
- Namibia—Sam Nujoma
- Pakistan—Muhammad Ali Jinna
- SriLanka—D.S.Senanayeke
- Tanzania—Julius Nerera
- Turkey—Musthafa Kamal

Founders of Towns in India

- Agra- Sikkandar Lodhi
- Ahmedabad - Ahmed Shah
- Ajmeer- Ajaypal Chauhan
- Allahabad- Akbar
- Culcutta- Job Charnok
- Delhi- Anankapalan
- Fathepur Sikri - Akbar
- Hisar- Ferozshah Tuglaq
- Hyderabad - Quli Qutabshah
- Jodhpur- Rao Jodha
- Mahabalipuram - Narasimhawarman
- Siri- Alaudden Khilji
- Vijayanagaram - Hariharan 1

List of Revolutions Relating to Products

- Blue Revolution - Fisheries Development
- Brown Revolution - Leather Production
- Grey Revolution - Housing Development
- Green Revolution - Agriculture Production
- Pink Revolution - Drugs & Pharmaceuticals
- Silver Revolution - Egg Production
- White Revolution - Dairy Development
- Yellow Revolution - Oil Seed Production

INDIAN HERITAGE SITES RECOMMENDED BY UNESCO

There are 32 World heritage sites in India that are being recognized as World heritage sites by UNESCO. Some of them are given below.

Ajanta Caves in 1983	Ajanta offers a rich tapestry of images that speak of places, royalty, culture and tales of everyday life of ancient India.
Ellora Caves in 1983	Ellora is the finest example of cave temples with almost 34 caves with intricate interiors and ornamental facades
Taj Mahal1 in 983	The Taj was built to enshrine the remains of Begum Mumtaz Mahal, the consort of Mughal Emperor Shah Jahan
Agra Fort in 1983	The fort is surrounded by a 70 foot high wall. Its houses the beautiful Pearl Mosque and numerous palaces
Sun Temple at Konark in 1984	The Sun temple of Konark, also known as Black Pagoda, is the crowning glory of the temple architecture of ancient Orissa

Monuments at Mahabalipuram in 1984	Mahabalipuram is world famous for its shore temples and it was the second capital of the Pallava kings of Kanchipuram
Kaziranga National Park in 1985	Kaziranga is one of the last strongholds of the endangered Indian one-horned rhinoceros
Manas Wildlife Sanctuary in 1985	The Manas river divides the lush, mixed deciduous forests that run through India to Bhutan
Keoladeo National Park in 1985	The Keoladeo Ghana Bird Sanctuary is situated just 55 kilometers from the Taj Mahal at Agra
Fatehpur Sikri in 1986	Fatehpur Sikri is the one of the finest examples of Mughal architectural splendour. It was built by Mughal Emperor Akbar
Churches and Convents in Goa in 1986	The churches and cathedrals built during 16th to 17th century A.D. (Basilica of Bom Jesus, etc) at Goa are a legacy of the Portuguese
Monuments at Khajuraho 1986	Khajuraho Monuments were built between 950-1050 A.D. near the village of Khajuraho under the patronage of the Chandela kings of northern central India
Monuments at Hampi 1986	Hampi, 353 kilometers from Bangalore, are one of the most fascinating historical sites in South India.
Brihadeeshwara Temple at Thanjavur 1987	The Brihadisvara temple with its 66.5 meters high 'srivimana' dominating the city is built of granite.
Sundarbans National Park 1987	The Sunderbans National Park, covering about 1330.10 sq. km, is the habitat of nearly 200 Royal Bengal tigers
Elephanta Caves 1987	Elephanta consists of seven caves of which the most notable is the Mahesa-murti cave
Monuments at Pattadakal 1987	Pattadakal, in Karnataka, illustrates the Chalukyan art which, in the 7th and 8th centuries A.D., under the Chalukya dynasty
Nanda Devi National Park 1988	The Nanda Devi National Park is one of the most spectacular wilderness areas in the Himalayas.
Buddhist Monastery at Sanchi 1989	Sanchi is a serene hill crowned by a group of stupas, monasteries, temples and pillars dating from 3rd Century BC to the 12th Cent AD.
Humayun's Tomb at Delhi 1993	Humayun`s Tomb is an early example of Mughal architecture built in Delhi
Qutab Minar 1993	Qutab Minar with a length of 238 feet, commands a panoramic view of the green fields extending into a sprawling city of Delhi
Darjeeling Himalayan Railway 1999	This toy train has achieved worldwide fame for engineering excellence, wonderful landscape and tourist attraction.
Bodhgaya Complex of Buddhist Temples 2002	A big complex of Buddhist temples that include the site where Lord Buddha had meditated to get enlightenment
Bhimbetka Rock Shelters and Caves near Bhopal 2003	The very recent addition has been the rock shelters & over 500 caves of Bhimbetka, belonging to the Neolithic age, which lies 46 km South of Bhopal, surrounded by the northern fringe of the Vindhyan ranges.

Chhatrapati Shivaji Terminus (formerly Victoria Terminus) 2004	This is an outstanding example of Victorian Gothic Revival architecture in India, blended with themes deriving from Indian traditional architecture. The building, designed by the British architect F.W. Stevens
Champaner Pawagarh Archaeological Park in Gujarat in 2004	A concentration of largely unexcavated archaeological, historic and living cultural heritage properties cradled in an impressive landscape which includes prehistoric (chalcolithic) sites, a hill fortress of an early Hindu capital, and remains of the 15th century capital of the state of Gujarat.
Red Fort complex, Delhi in 2007	The 17th century Mughal marvel, Red Fort, has joined the ranks of 26 other Indian sites, to be included in UNESCO's list of World Heritage Sites. Earlier it almost got nominated in 1993, but due to the army occupying it that time, the government deferred nominating it that time.
Jantar Mantar of Jaipur,Rajastan in 2010	The Jantar Mantar, in Jaipur, is an astronomical observation site built in the early 18th century. It includes a set of some 20 main fixed instruments. This is the most significant, most comprehensive, and the best preserved of India's historic observatories.

Hill Forts of Rajasthan (2013)	The sites consists of six majestic forts Chittorgarh, Kumbhalgarh, Sawai Madhopur, Jhalawar, Jaipur, and Jaisalmer of Rajasthan. They are the major urban centres which flouriched during 8th to 18th centiry AD.
Rani-ki-Vav (the Queen's step well at patna Gujarat 2014)	It is characterized by high alpine peaks, alpine meadows and riverine forests. It is situated in the northern India state of Himachal Pradesh covering nearly 90,540 ha of area which include mountain glaciers, snow melt water sources of river, rich assemblage of fauna species.
Western Ghats (2012)	These ghats or (mountain ranges) are older than Himalayan mountains which cover unique species of non-equatorial tropical evergreen forest. It is characterised by exceptionally high level of biological diversity known as one of the eight "hottest spot: in the world.

SOBRIQUETS

A sobriquet is a nickname, Occasionally assumed and often given by anther. It is usually a familiar name. This significant distinctive is a ample familiarity that the sobriquet can become more familiar than the original name.

Person	**Primary Names**
Anna	C N Annadurai
Badshah Khan/ Frontier Gandhi	Abdul Ghaffar Khan
Buddha	Siddhartha Gautama
Chacha	Jawaharlal Nehru
Deenabandhu	C F Andrews
Deshbandhu	C. R. Das
Father of the Nation	Mohandas Karamchand Gandhi
Frontier Gandhi	Abdul Gaffar Khan

Grand Old Man of India	Dadabhai Naoroji
Gurudev	Rabindranath Tagore
Guruji	M S Gohlwalkar
Kaviguru	Rabindranath Tagore
Lokmanya	Bal Gangadhar Tilak
Loknayak	Jayaprakash Narayan
Mahatma Gandhi	Mohandas K. Gandhi
Man of Peace	Lal Bahadur Shastri
Manitas de Plate	Flamenco guitarist Ricardo Baliardo
Netaji	Subhash Chandra Bose
Nightingale of India	Sarojini Naidu
Panditji	Jawaharlal Nehru
Punjab kesari	Lala Lajpat Rai
Rajaji	C Rajagopalachari
Saint of the Gutters	Mother Teresa
Father of the Nation	Mohandas Karamchand Gandhi
Haryana Hurricane	Kapil Dev
Prince of Kolkata	Saurav Ganguly
Places	**Primary Names**
Bengal's Sorrow	Damodar Rever, India
Blue Mountain	Niligiri Hills, India
City of Golden Temple	Amritsar, India
City of Palaces	Kolkata, India
Diamond City in India	Surat, Gujarat
Garden City of India	Bengaluru
Garden of India	Kashmir
Gateway of India	Mumbai
God's Own Country	Kerala
Land of Five Rivers	Punjab, India
Pink City	Jaipur, India
Queen of Arabian Sea	Kochi, India
Spice Garden of India	Kerala
The City of Joy	Kolkata, India
The City of Palaces	Kolkata, India
Venice of East	Alleppey, India
Queen of Arabian Sea	Kochi, India
Garden City of India	Bangalore
Blue Mountains	Niligiri Hills, India

World Panorama

WORLD COUNTRIES, CAPITAL, LANGUAGE & THEIR CURRENCY

Country	Capital	Chief Language	Currency
Afghanistan	Kabul	Pushtu Dari	Afghani
Algeria	Algiers	Arabic, French	Algerian Dinar
Argentina	Buenos Aires	Spanish	Argentine Peso
Australia	Canberra	English	Australian Dollar
Azerbaijan	Baku	Azeri	Manat
Bahrain	Manama	Arabic, English	Bahraini, Dinar
Bangladesh	Dhaka	Bangla	Taka
Belgium	Brussels	Flemish (Dutch), French, German	Euro
Bhutan	Thimphu	Dzongkha	Ngultrum
Bolivia	La Paz; Sucre	Aymara Spanish, Quechua	Boliviano
Bosnia and Herzegovina	Sarajevo	Serbo-Croatian	Conv.Mark
Brazil	Brazilia	Portuguese	Real
Bulgaria	Sofia	Bulgarian	Lev
Burkina Faso	Ouagadougou	French	Franc
Cambodia	Phnom-Penh	Khmer	Riel
Canada	Ottawa	French, English	Canadian Dollar
Chile	Santiago	Spanish	Peso
China	Beijing	Chinese (Mandarin)	Yuan
Colombia	Bogota	Spanish	Peso
Congo Formerly Zaire	Kinshasa	French	Congolese Franc
Costa Rica	San Jose	Spanish	Colon
Croatia	Zagreb	Croatian	Kuna
Cuba	Havana	Spanish	Peso
Czech Republic	Prague	Czech	Koruna
Denmark	Copenhagen	Danish	Krone
Ecuador	Quito	Spanish	United States dollar
Egypt	Cairo	Arabic	Egyptian Pound
Ethiopia	Addis Ababa	Amharic	Birr
Fiji	Suva	English	Fijian Dollar
Finland	Helsinki	Finnish, Swedish	Euro
France	Paris	French	Euro
French Guiana	Caine	French	Euro

Country	Capital	Chief Language	Currency
Georgia	Tbilisi	Georgian	Lari
Germany	Berlin	German	Euro
Ghana	Accra	English	Ghana Cedi
Greece	Athens	Greek	Euro
Guatemala	Guatemala City	Spanish	Quetzal
Guyana	Georgetown	English	Guyana Dollar
Haiti	Port-au-Prince	French	Gourde
Honduras	Tegucigalpa	Spanish	Lempira
Hong Kong	Victoria	English, Chinese	Hong Kong Dollar
Hungary	Budapest	Hungarian	Forint
India	New Delhi	Hindi (official), English and 22 officially recognised regional languages	Rupee
Indonesia	Jakarta	Bahasa Indonesian, Dutch, English Javanese	Rupiah
Iran	Teheran	Persian (Farsi), Turk, Kurdish, Arabic	Rial
Iraq	Baghdad	Arabic, Kurdish	Iraqi Dinar
Ireland	Dublin	Irish, English	Euro
Israel	Jerusalem	Hebrew, Arabic	Shekel
Italy	Rome	Italian	Euro
Japan	Tokyo	Japanese	Yen
Jordan	Amman	Arabic, English	Jordan Dinar
Kazakhstan	Astana	Kazakh, Russian, German	Tenge
Kenya	Nariobi	Kiswahili, English, Kikuyu	Shilling
Korea, North	Pyongyang	Korean	Won
Korea, South	Seoul	Korean	Won
Kuwait	Kuwait city	Arabic, English	Kuwait Dinar
Lebanon	Beriut	Arabic, French, English	Pound
Libya	Tripoli	Arabic	Libyan Dinar
Luxembourg	Luxembourg	French, German, English, Luxembourgish	Euro
Malaysia	Putrajaya (formerly Kuala Lumpur)	Malay, English, Chinese, Tamil	Ringgit
Mauritius	Port Louis	English, French, Creole, Hindustani	Rupee Mauritian
Mexico	Mexico city	Spanish, Amerindian languages	Mexico Peso
Mongolia	Ulan Bator	Mangolian	Togrog
Myanmar	Naypyidar or Pyinmana (formerly Yangon)	Burmeses and tribal languages	Kyat
Netherlands	Amsterdam	Dutch	Euro
New Zealand	Wellington	English and Maori dialect	New Zealand Dollar

Country	Capital	Chief Language	Currency
Nigeria	Abuja	English, Hansa, Ibo, Yoruba	Naira
Norway	Oslo	Norwegian	Krone
Oman	Muscat	Arabic	Omani Rial
Pakistan	Islamabad	Urdu, Punjabi, Sindhi, Pusthu, Baluchi, Brahvi, English	Pakistani Rupee
Peru	Lima	Spanish, Quechua, Aymara	Nuero Sol
Philippines	Manila	Filipino, English, Spanish	Peso
Poland	Wrsaw	Polish	Zloty
Portugal	Lisbon	Portuguese	Euro
Qatar	Doha	Arabic, English	Riyal (QAR)
Russia	Moscow	Russian	Russian ruble
Saudi Arabia	Riyadh	Arabic	Rial (SAR)
Serbia	Belgrade	Serbo-Croatian (official), Albanian	Dinar
Singapore	Singapore city	Malay, Chinese, Tamil, English	Singapore Dollar
Somalia	Mogadishu	Arabic, English, Italian	Somali Shilling
South Africa	Capetown	Afrikaans, English	Rand
Spain	Madrid	Spanish, Catalan, Basque, Galician	Euro
Sri Lanka	Colombo	Sinhala, Tamil, English	Sri Lankan Rupee
Sudan	Khartoum	Arabic, English, Dinka, Nubian	Sudanese Pound
Sweden	Stockholm	Swedish	Krona
Switzerland	Berne	German, French, Italian, Romansch	Swiss Franc
Syria	Damascus	Arabic, Kurdish, Armenian	Syrian Pound
Taiwan	Taipei	Mandarian Chinese, Taiwan, Hakka dialects	New Taiwan Dollar
Thailand	Bangkok	Thai, Chinese, English, Malay	Thai Baht
Tunisia	Tunis	Arabic, French	Dinar
Turkey	Ankara	Turkish, Kurdish, Arabic	Turkish Lira
Uganda	Kampala	Englsih, Luganda, Swahili	Ugandan Shilling
United Arab Emirates	Abu Dhubi	Arabic	Dirham
United Kingdom	London	English, Welsh, Scots, Gaelic	Pound Sterling
United States of America	Washington D.C.	English	Dollar
Venezuela	Caracas	Spanish	Bolivar
Vietnam	Hanoi	Vietnamese, French, English, Chinese	Dong
Yemen	Sana'a	Arabic	Rial
Zimbabwe	Harare	English, Shona, Ndebela	Dollar (ZWD)

LIST OF IMPORTANT GEOGRAPHICAL DISCOVERIES AROUND THE WORLD

- **Amundsen (Norwegian)-**Discovered South Pole in 1912.
- **Byrd-American aviator and polar explorer.** Flew over the North Pole in 1926 and made the first flight over the South Pole in 1929. Discovered Edsel Ford mountains and Morei Byrd land.
- **Cabot (Venetian)-**Discovered New Foundland in 1494.
- **Captain Cook (English)-**Discovered Sandwich (now Hawaiian) Isles in 1770.
- **Columbus-**Discovered West Indies in 1492 and South America in 1498.
- **Copernicus-**Discovered Solar System in 1540. Propounded the astronomical system which bears his name.
- **David Livingstone-**Discovered course of the Zambesi, the Victoria Falls and Lake Nyasa in Africa.
- **Edmund Hillary-**Joint conqueror of Mount Everest with Tenzing. He also led a Trans-Atlantic expedition and reached South Pole on January 3, 1958.
- **Ferdinand de Lesseps-**Conceived the plan of the Suez Canal on which work was completed in 1869 through his efforts.
- **Francis Younghusband-**Explored the frontier regions of India, China and Tibet.
- **Kepler-**Discovered the Laws of Planetary Motion in 1609.
- **Lindbergh-**Performed the first solo-flight across the Atlantic in 1927 from New York to Paris.
- **Magellan-**Commanded the first expedition in 1519 to sail round the world. Discovered passage to the Pacific from the Atlantic through Straits afterwards named after him.
- **Marco Polo-**Venetian traveller who explored China, India, South Eastern countries and published the record of his various explorations. He was the first European to visit China.
- **Nansen-**Norwegian explorer who explored across Greenland and reached the highest altitude in the North Polar Region, till then attained.
- **Peary, Robert-**First to reach the North Pole in 1909.
- **Pedro Alvares Cabral (Portuguese) -** Discovered Brazil in 1500.
- **Shackleton-**Arctic explorer, reached within 160 km of the South Pole.
- **Sven Hedin-**Swedish explorer. Made great contribution to the geographic and archaeological knowledge of large areas of Central Asia.
- **Iksman-**Dutch navigator, discovered the Tasmania Island and New Zealand in 1642.
- **Tenzing (Indian)-**First to reach Mount Everest on 29th May, 1953 along with Edmund Hillary. The expedition was led by Col. Sir John Hunt.
- **Vasco da Gama (Portuguese)-** Rounded the Cape of Good Hope and discovered the sea route to India in 1498.

NATIONAL ANIMALS OF THE MAJOR COUNTRIES

Country	Animals	Country	Animal
Afghanistan	Snow Leopard	Nepal	Cow
Albania	Golden Eagle	New Zealand	Kiwi
Australia	Kangaroo	Pakistan	Markhor
Bangladesh	Royal Bengal tiger	South Africa	Springbok
Brazil	Macaw	Spain	Bull
Canada	North American beaver	United Kingdom	Barbary Lion
China	Panda, Red Crowned Crane	United States	Bald Eagle
Denmark	Mute Swan	India	Bengal Tiger
Japan	Green Pheasant	Kuwait	Camel
Myanmar	Tiger	Belgium	Lion

Official Books
Blue Book : An official report of the British Government
Green Book : An official publication of Italy and Persia
Grey Book : An official reports of the Government of Japan and Belgium
Orange Book : An official Publications of the Government of Netherlands
White Book : An official Publications of China, Germany and Portugal
Yellow Book : French official Book
White Paper : An official paper of the Government of Britain and India on a particular issue
Red Data Book: Russian official book which contains lists of species whose continued existence is threatened

NEW 7 WONDERS OF THE WORLD

	Petra, Jordan
Christ the Redeemer, Brazil	The Colosseum, Rome, Italy
Great Wall of China, China	The Taj Mahal, India
Machu Picchu, Peru	Chichen Itza, Mexico

WORLD'S MOST POWERFUL INTELLIGENCE AGENCIES

Detective Agency	Country	Detective Agency	Country
Ministry of State Security	China	VAJA	Iran
Australian Secret Intelligence Service (ASIS)	Australia	MOSSAD	Israel
FSB	Russia	Egyption Homeland Security	Egypt
State Security Agency	South Africa	PSIA	Japan
Inter Service Intelligence (ISI)	Pakistan	Iraqi National Intelligence Service	Iraq
MI (Military Intelligence) 5 and 6, Special Branch, Joint Intelligence org.	UK	Central Intelligence Agency (CIA), Federal Bureau of investigation (FBI)	USA
Research and Analysis wing (RAW), Intelligence Bureau (IB)	INDIA	DGSE (Direction General Dela Securite Exterieure	France

Direction Generale De La Securite Exterieure (DGSE), France

The General Directorate for External Security (DGSE) is the intelligence agency of France. It was founded in 1982 to gather intelligence from foreign sources to assist in military and strategic decisions. It is not as famous as CIA or Mossad, but DGSE claims to have prevented more than 15 terrorist attacks in France since 9/11. The agency has a network of around 5000 agents spread across France and the world. Its head office is in the 20th arrondissement of Paris.

The Institute for Intelligence and Special Operations, MOSSAD, Israel

One of the most powerful secret service agencies in the world, the Mossad, meaning Institute for Intelligence and Special Operations, is the national intelligence agency of Israel. Mossad, like the CIA, has active agents spread across the world and are involved in intelligence gathering, covert operations and 'protecting Jews and Jewish interests'. Mossad was formed on December 13, 1949, as the Central Institute for Coordination at the recommendation of Prime Minister David Ben-Gurion to Reuven Shiloah.

Federal Security Services (FSB), Russia



Federal Security Services is the principal security agency of Russia and the foremost successor agency to the USSR's Committee of State Security(KGB). Its main responsibilities are within the country and include counter-intelligence, internal and border security, counter-terrorism, and surveillance as well as investigating some other types of grave crimes and federal law violations. It is headquartered in Lubyanka Square, Moscow's centre, in the main building of the former KGB. The Director of the FSB since 2008 is army general Aleksandr Bortnikov.

Ministry of State Security (MSS), China

The Ministry of State Security (MSS) is one of the most powerful and most active Chinese intelligence agencies. Its main objective is to keep track and neutralise "enemies" of the Communist Party of China. It is headquartered near the Ministry of Public Security of the People's Republic of China in Beijing. MSS holds the same authority to arrest or detain people as regular police for crimes involving state security with identical supervision by the procuratorates and the courts.

Military Intelligence Section 6 (MI6), United Kingdom

The Secret Intelligence Service (SIS), popularly referred to as the Directorate of Military Intelligence Section 6 (MI6), is known as the "the secret front line" of Britain`s national security. A century old organisation, the MI6's presence was not officially acknowledged till 1994. The agency is tasked with gathering foreign intelligence from across the globe that could impact political and economic interests in the UK. Since 1995, the SIS headquarters have been at Vauxhall Cross on the South Bank of the River Thames.

Inter Service Intelligence (ISI), Pakistan

Established in 1948, Pakistan's Directorate for Inter-Services Intelligence (ISI) is the premier military operated intelligence service of Pakistan. The ISI was established as an independent intelligence service in 1948 in order to strengthen the sharing of military intelligencebetween the three branches of Pakistan Armed Forces in the aftermath of the Indo-Pakistani War of 1947, which had exposed weaknesses in intelligence gathering, sharing and coordination between the Army, Air Force and Navy. The ISI has headquarters in Islamabad, Islamabad Capital Venue, and is currently headed by Lieutenant-General Rizwan Akhter, who succeeded Zaheerul Islam in October 2014.

Central Intelligence Agency, CIA, United States

The Central Intelligence Agency (CIA) of the United States of America is indeed the largest secret service with the maximum reach. The CIA is known to play a pivotal role in helping the US maintain its status as the world's sole super power. More importantly, CIA has been playing a central role in exchange of intelligence between countries to combat global terrorism.

Research and Analysis Wing (RAW, India)

Founded in 1968, the Research and Analysis Wing (RAW), initially, focused its activities in India's immediate neighbourhood but with the changing profile of New Delhi's geo-political interests, it has spread its wings to other regions across the world. The primary function of R&AW is gathering foreign intelligence and counter-terrorism. R&AW was formed in September 1968 under the guidance of its first Director, Rameshwar Nath Kao. Headquartered in New Delhi, R&AW's current chief is Rajinder Khanna, a 1978-batch IPS cadre officer.

Canadian Security Intelligence Service (CSIS)

Canadian Security Intelligence Services is Canada's primary national intelligence service. It is responsible for collecting, analyzing, reporting and disseminating intelligence on threats to Canada's national security, and conducting operations, covert and overt, within Canada and abroad. It also reports to and advises the government of Canada on national security issues and situations that threaten the security of the nation. Its headquarters is located in Ottawa, Ontario, in a purpose-built facility completed in 1995.

Australian Secret Intelligence Service (ASIS)

The Australian Secret Intelligence Service (ASIS) is Australia's intelligence watchdog which keeps a close watch on developments across the world, especially in the Asia-Pacific region. Although Australia is relatively isolated from global terror, still ASIS works 24X7 to protect the country's political and economic interests. Interestingly, the existence of ASIS, founded in 1952, was a secret even from its own government for over twenty years.Its current Director-General is Nick Warner.

FATHER OF VARIOUS FIELDS

Field	Father	Field	Father
Atom Bomb	Dr. Robert Oppenheime	Computer	Charles Babbage
Aviation	Sir George Cayley	Biology	Aristotle
Chemistry	Robert Boyle	Microbiology	Louis pasteur and Robert koch
Comedy	Aristophanes	Political Science	Aristotle
Economics	Adam Smith	Modern Philosphy	Rene Descartes
English Poetry	Geoffrey Chaucer	Psychology	Wilhelmam Wundt
Greek Tragedy	Aeschylus	Modern Observational Astronomy	Galileo Galilei
Immunology	Edward Jenner	Modern Physics Science	Galileo Galilei
Modern Chemistry	Antoini Lavoisier	Modern Science	Galileo Galilei
Nuclear Physics	Ernest Rutherford	Nano technology	Richard Smalley
Sanskrit Grammar	Panini	Indian Nuclear Science	Homi Jehangir Bhabha
Geography	Eratosthenes	Anatomy	Andreas Vesalius
Sociology	Auguste Comte	Geometry	Euclid
Mathematics	Archimedes	Internet	Vinton Cerf

SOBRIQUETS

A sobriquet is a nickname, Occasionally assumed and often given by another. The sobriquet can become more familiar than the original name.

Sobriquets Person	Primary Names
Angel of Death	Josef Mengele
Bard of Avon	William Shakespeare
Bard of Twickenham	Alexander Pope
Bloody mary	Mary I of England
Bonnie Prince Charlie	Charles Edward Stuart
Brangelina	Brad Pitt and Angelina Jolie
Caligula	Gaius Julius Caesar Augustus Germanicus
Canuck	Canadian, from Johnny Canuck
der Alte (the old man)	Konrad Adenauer
Desert Fox	Erwin Rommel
Diamond Dave	David Lee Roth, Singer
Digger	Australian soldier
Dr. Death	Jack Kevorkian, proponent of assisted suicide

Sobriquets Person	Primary Names
Dubya	George W. Bush
EI Caudillo	Francisco Franco
Father of his country	George Washington
Fuhrer	Adolf Hitler
Genghis Khan	Temüjin
Grand Old Man of Britain	Willian Ewart Glandstone
Hanoi Jane	Jane Fonda
Honest Abe	Abraham Lincoln
Ike Dwight	David Eisenhower
Iron Duke	Duke of Wellington
Iron Lady	Margaret Thatcher
King James	LeBron James, American basketball player
Lady with the Lamp	Florence Nightingale
Little Richard	Rev. Richard Wayne Penniman, a prominent figure in rock n' roll.
Madge	Madonna
Madiba	Nelson Mandela
Maid of Orleans	Joan of Arc
Man of Blood and Iron	Otto Von Bismark
Man of Destiny	Napolean Bonaparte
Old Blood and Guts	George S. Patton
Old Blue Eyes	Frank Sinatra, entertainer
Old Hickory	Andrew Jackson, 7th President of the United States
Old Kinderhook (OK)	Martin Van Buren, 8th President of the United States
Old Nick	Santa
Old Rough and Ready	Zachary Taylor
Old St. Nick	Santa
Pelê	Edson Arantes do Nascimento
Prince of the Humanists	Desiderius Erasmus
Qaid-e-Azam	Mohammad Ali Jinnah
Saint Jimmy	Billie Joe Armstrong
Satchmo	Louis Armstrong
Slick Willy	U.S. President Bill Clinton
Slowhand	Eric Clapton
Sting	Gordon Summer, British rock musician
The Bard	William Shakespeare
The Bird	Mark Fidrych, Baseball pitcher
The Boss	Bruce Springsteen
The Cincinnatus of the Americans	George Washington
The Duke	John Wayne
The Fab Four	The Beatles
The Godfather of Soul	James Brown

Sobriquets Person	Primary Names
The Golden Bear	Jack Nicklaus
The Great Commoner	William Pitt, 1st Earl of Chatham ("Pitt the elder") or William Jennings Bryan
The Greatest	Muhammad Ali, Boxer
The King (of golf)	Arnold Palmer
The King (of Rock and Roll)	Elvis Presley
The King of Pop	Michael Jackson
The Lion of the Round Top	Col. Joshua L. Chamberlain, commander of the 20th Maine Regiment, American Civil War
The Man from Tennessee	Andrew Jackson
The Material Girl	Madonna
The New Sinatra	Jay-Z
The Rat Pack	A group of American singers and entertainers from the late 1950s to the early 1970s
The Red Baron	Manfred von Richthofen, World War I, German flying ace
The Rock Chemeleon	David Bowie
The Tiger of France	Georges Clemenceau
Tricky Dick	Richard Nixon, 37th President of the United States
Uncle Sam	The U.S.A. or sometimes the government
Wizard of the North	Walter Scott
Yank (a short form of "Yankee")	Originally used derogatorily by Southerners but now only heard outside the USA

PLACES

Beantown	Boston, Massachusetts, USA
Blighty	Great Britain (used by British servicemen abroad and expatriates)
Brass Fountain	PPSh-41
Brew City	Milwaukee, Wisconsin
Brisvegas	Brisbane, Queensland, Australia
Britain of South	New Zealand
Chocolate City	Washington, D.C., so named because of its majority African-American population
City of Brotherly Love	Philadelphia
City of Dreaming Spires	Oxford, England
City of Golden Gate	San Francisco, USA
City of Magnificent Distances	Washington D.C., USA
City of Seven Hills	Rome, Italy
City of Skyscrapers	New York, USA
City of the Golder Gate	San Francisco
Cockpit of Europe	Belgium
Dark Continent	Africa

Empire City	New York, USA
Eternal City	Rome, Italy
Forbidden City	Lhasa, Tibet
Frisco	San Francisco, California
Garden of England	Kent, England
Garrincha	Manoel Francisco dos Santos
Gate of Tears	Bab-el-mandab, Jerusalem
Gift of Nile	Egypt
Gotham	New York
Granite City	Aberdeen, Scotland
Great White Way	Broadway, New York, USA
Hermit Kingdom	Korea
Herring Pond	Atlantic Ocean
Hogtown	Toronto, Ontario, Canada
Holy Land	Palestine
Humming Bird	Trinidad
Island of Cloves	Madagascar
Island of Pearls	Bahrain
Key of Mediterranean	Gibraltar
Land of Cakes	Scotland
Land of Canals	Netherlands
Land of Golden Pagoda	Myanmar (Burma)
Land of Lilies	Canada
Land of Maple	Canada
Land of Midnight Sun	Norway
Land of Morning Calm	Korea
Land of Rising Sun	Japan
Land of the Golden Fleece	Australia
Land of the Golden Pagoda	Myanmar
Land of Thousand Lakes	Finland
Land of Thunderbolt	Bhutan
Land of White Elephants	Thailand
Land of Windmills	Netherlands
Manchester of Japan	Osaka
Never Never Land	Prairies of N.Australia
Pearl of the Antilles	Cuba
Pearl of the Orient	Philippines
Perfidious Albion	Great Britain
Pillars of Hercules	Strait of Gibraltar
Playground of Europe	Switzerland
Port of Five Seas	Moscow
Powder Keg of Europe	Balkans
Quaker City	Philadelphia, USA
Queen of Adriatic	Venice, Italy

Roof of the World	Pamirs, Central Asia
Sick Man of Europe	Turkey
Sin City	Las Vegas, Nevada, USA
Sorrow of China	River Hwang Ho
Sugar Bowl of the World	Cuba
Taiwan	Republic of China
The Antipodes	Australia and New Zealand
The Battlefield of Europe	Belgium
The Bayou City	Houston, Texas, USA
The Big Apple	New York City
The Big D	Dallas, Texas, USA
The Big Easy	New Orleans, Louisiana
The Big Smoke	Toronto, Ontario, Canada
The City of Light	Paris
The City or The City by the Bay	San Francisco, California
The Dragon	China (as an economy)
The Emerald City	Seattle, Washington, USA
The Emerald Isle	Ireland and Puerto Rico
The Enchanted Isle	(from 'la isla del encanto') Puerto Rico
The Federal City	Washington D.C.
The Fourth Estate	The press
The Mother-in-law of Europe	Denmark
The Old Bailey	The Central Criminal Court in England
The Old Lady of Threadneedle Street	The Bank of England
The Old Smoke	London
The Paris of the South	São Paulo and Buenos Aires
The Paris of the West	San Francisco, USA
Tie Rock (prison)	Alcatraz Prison
The Steel City	Pittsburgh, Pennsylvania.
The Windy City	Chicago, Illinois, USA
Tinseltown	Hollywood, California, USA
Venice of the North	Stockholm
Westminster	The British Parliament
White City	Belgrade, Yugoslavia
White House	The executive branch of the government of the United States
White Man's Grave	Guinea Coast
Whitehall	The British government including Parliament but excluding the monarchy
World's Breadbasket	Prairies of N. America
World's Loneliest Island	Tristan De Gunha (Mid-Atlantic)
Yellow River	Hang He (China)

ADDITIONAL FACTS

- The largest coffee growing country in the World is - Brazil
- The biggest delta in the World is the - Sunderbans
- The Japanese call their country as - Nippon
- The biggest Island of the World is - Greenland
- The river which carries maximum quantity of water into the sea is the - Mississippi
- Mount Everest was named after Sir George - Everest
- The biggest stadium in the world is the - Strahov Stadium, Prague
- The world's largest diamond producing country is - South Africa
- The Eggel tower was built by - Alexander Eiffel
- The Red Cross was founded by - Jean Henri Durant
- The permanent secretariat of the SAARC is located at - Kathmandu
- The earlier name of Sri Lanka was Ceylon
- The founder of the Republic of China was - San Yat Sen

FIRST IN THE WORLD

The first person to reach Mount Everest	Sherpa Tenzing, Edmund Hillary
The first person to reach North Pole	Robert Peary
The first person to reach South Pole	Amundsen
The first religion of the world	Hinduism
The first country to print book	China
The first country to issue paper currency	China
The first country to commence competitive examination in civil services	China
The first President of the U.S.A	George Washington
The first Prime Minister of Britain	Robert Walpole
The first Governor General of the United Nations	Trygve Lie
The first country to win football World cup	Uruguay
The first country to prepare a constitution	U.S.A
The first Governor General of Pakistan	Mohd. Ali Jinnah
The first country to host NAM summit	Belgrade (Yugoslavia)
The first European to attack India	Alexander, The Great
The first European to reach China	Marco Polo
The first person to fly aeroplane	Wright Brothers
The first person to sail round the world	Magellan
The first country to send man to the moon	U.S.A
The first country to launch Artificial satellite in the space	Russia
The first country to host the modern Olympics	Greece
The first city on which the atom bomb was dropped	Hiroshima (Japan)
The first person to land on the moon	Neil Armstrong followed by Edwin E. Aldrin
The first shuttle to go in space	Columbia

The first spacecraft to reach on Mars	Viking-I
The first woman Prime Minister of England	Margaret Thatcher
The first Muslim Prime Minister of a country	Benazir Bhutto (Pakistan)
The first woman Prime Minister of a country	Mrs. S. Bandamaike (Sri Lanka)
The first woman to climb Mount Everest	Mrs. Junko Tabei (Japan)
The first woman cosmonaut of the world	Velentina Tereshkova (Russia)
The first woman President of the U.N. General Assembly	Vijaya Lakshmi Pandit
The first man to fly into space	Yuri Gagarin (Russia)
The first batsman to score three test century in three successive tests on debut	Mohd. Azharuddin
The first man to have climbed Mount Everest twice	Nawang Gombu
The first U.S. President to resign Presidency	Richard Nixon

SUPERLATIVES

Tallest Animal on (land)	Giraffe
Biggest Bell	Great Bell at Moscow
Fastest Bird	Swift
Largest Bird	Ostrich
Smallest Bird	Humming Bird
Longest Bridge (Railway)	Lower Zambeji (Africa)
Tallest Building	Burj khalifa, Dubai (U.A.E)
Tallest office Building	Patronas Twin Towers Kuala Lampur (Malaysia)
Longest Big Ship Canal	Seuz Canal (Linkin red sea & Mediterranean)
Busiest Canal (Ship)	Baltic White Sea Canal (152 miles)
Biggest Cinema House	Roxy (New York)
Highest City	Wen Chuwan (Tibet, China) 16,732 ft.
Largest City (in population)	Tokyo [(3,42,00000), Est. population in 2006]
Biggest City in (area)	Mount Isa, Queensland, Australia (41225 sq. km.)
Largest Continent	Asia
Smallest Continent	Australia
Largest Country (in population)	China
Largest Country (in area)	Russia
Largest Coral Formation	The Great Barrier Reef (Australia)
Largest Dam	Grand Coulee- Concrete Dam (U.S.A)
Longest Day	June 21 (in Northern Hemisphere)
Shortest Day	Dec. 22(in Northern Hemisphere)
Largest Delta	Sundarbans, India (8000 sq. miles)
Longest Desert (World)	Sahara, Africa (84, 00,000 sq. km.)
Largest Diamond	The Cullinan (over 1 ½ 1b.)
Biggest Dome	Gol Gumbaz (Bijapur), (Old archi) 144 ft. diameter.
Biggest Dome (New Archi)	Astrodome, Sports

Longest Epic	The Mahabharata
Largest Island	Greenland (renamed Kalaallit Nunaat)
Largest Lake (Artificial)	Lake Mead (Bouler)
Deepest Lake	Baikal (Siberia); average depth2300 ft.
Highest Lake	Titicaca (Bolivia) 12645 ft. above sea level.
Largest Lake (Fresh Water)	Lake Superior, U.S.A
Largest Lake (Salt Water)	Caspian Sea 3, 71,000 sq. km.)
Largest Mosque	Jama Masjid, Delhi, (area 10,000 sq. ft.)
Biggest Library	National Kiev Library,Moscow & Library of the Congress, Washington)
Highest Mountain peak (World)	Himalayas
Longest Mountain Range	Andes (S.America) 5,500 miles in length
Biggest Museum	British Museum (London)
Tallest Minaret (Free Standing)	Qutub Minar, Delhi 238 ft.
Tallest Minaret	Great Hassan Mosque, Casablanca, Morocco
Deepest & Biggest Ocean	The Pacific
Largest Palace	Imperial Palace (Gugong), Beijing (China)
Largest Park	National Park, Greenland
Largest Peninsula	Arabic (32,50,000 sq. km.)
Coldest Place or Region	Verkhoyansk (Syberia), Temperature – 85° C
Driest Place	Death Valley (California); rainfall 1 ½ inch.
Hottest Place (World)	Al-Aziziyah (Libya, Africa) 136°F
Largest Planet	Jupiter
Brightest and Hottest Planet (also nearest to Earth)	Venus
Farthest planet (from the Sun)	Neptune
Nearest Planet (to the Sun)	Mercury
Smallest Planet	Mercury
Highest Plateau	Pamir (Tibet)
Longest Platform (Railway)	Kharagpur W.B, India (833m)
Largest Platform (Railway)	Grand Central terminal, New York (U.S.A)
Largest Port	Port of New York & New Jersey (U.S.A)
Busiest Port	Rotterdam (the Netherlands)
Longest Railway	Trans-Siberian Railway (6,000 miles Long)
Longest River	Nile (6690 km), Amazon (6570 km.)
Longest River Dam	Hirakund Dam (Orissa), India 15.8 miles.
Largest sea-bird	Albatross
Largest Sea (inland)	Mediterranean
Brightest Star	Sirius (also called Dog star)
Tallest statue	Statue of Liberty, New York (U.S.A), 150 ft. high.
Tallest Statue (Bronze)	Bronze Statue of Lord Buddha, Tokyo (Japan).
Longest Swimming Course	English Channel
Tallest Tower	C.N Tower Toronto (Canada)
Longest Train nonstop	Flying Scoutsman
Longest Tunnel (Railway)	Seikan Rail Tunnel (Japan), (53.85 km.)
Longest & Largest Canal Tunnel	Le Rove Tunnel (South of France)

Longest Tunnel (Road)	Laerdal, Norway
Highest Volcano	Ojos Del Salado, Andes Argentine-Chile (6,885 m.)
Largest Volcano	Mauna Lao (Hawaii)
Longest Wall	Great Wall of China (1500 miles)
Highest Waterfall	Salto Angel Falls (Venezuela)
Longest Strait	Tartar Strait (Sakhalin Island & the Russian mainland)
Broadest Strait	Davis Straits (Greenland & Baffin Island, (Canada)
Narrowest strait	Chaliks-45 yards (Between the Greek mainland the island of Euboea in the Aegean Sea)
Largest Bay	Hudson Bay, Canada (Shore line 7623 miles)
Largest Gulf	Gulf of Mexico,(shoreline 2100 miles)
Largest Archipelago	Indonesia (over 3,000 Islands)
Tallest Active Geyser	Giant (Geyser) yelowstone park U.S.A 200 ft. high
Largest River Basin	Amazon Basin- 27, 20,000 sq. mile.
World Rainiest Spot	Cherrapunji (Mawsynram), India
Largest Gorge	Grand Canyon, on the Colorado River, U.S.A
Lightest gas	Hydrogen
Lightest Metal	Lithium
Highest Melting Point	Tungsten, 3,410`C
Hardest Substance	Diamond
Longest Animal	Blue Whale, (recorded length 106 ft. weight-195 tons)
Longest Life Span of an Animal	190 to 200 years, (Giant tortoise)
Largest Land Animal	African Bush Elephant
Fastest Animal	Cheetah (Leopard) 70 m.p.h
Longest Jump Animal	Kangaroo
Longest wing Spread Bird	Albatross
Slowest Animal	Snail
Domestic Dog	Irish Wolf Hound
Fastest Dog	Persian Grey Hound (speed 43 m.p.h)
Longest poisonous snake	King cobra
Biggest Flower	Raffesia (Java)
Largest Stadium	Strahov stadium in prague, (the Czech Republic)
Largest Church	Basilica of st. peter, vetican city, Rome Italy
Largest Temple	Angkor Vat (combodia)
Largest Diamond mine	Kimbarley (S.Africa)
Largest River in volume	Amazon, Brazil
Longest Corridor	Rameshwaram Temple's Corridor (5000 ft.)
Highest Straight Dam	Bhakhra Dam
Highest Capital City	La Paz (Bolivia)
Largest Asian Desert	Gobi, Mongolia
Largest Democracy	India
Longest Thoroughfare	Verazano-Narrows, New York City Harbour
Largest Neck Animal	Giraffe
Largest Animal of the Cat Family	Lion

Most Intelligent Animal	Chimpanzee
Bird, that never makes its nests	Cuckoo
Wingless Bird	Kiwi
Reptile which changes its colors	Chameleon
Largest Mammal	whale

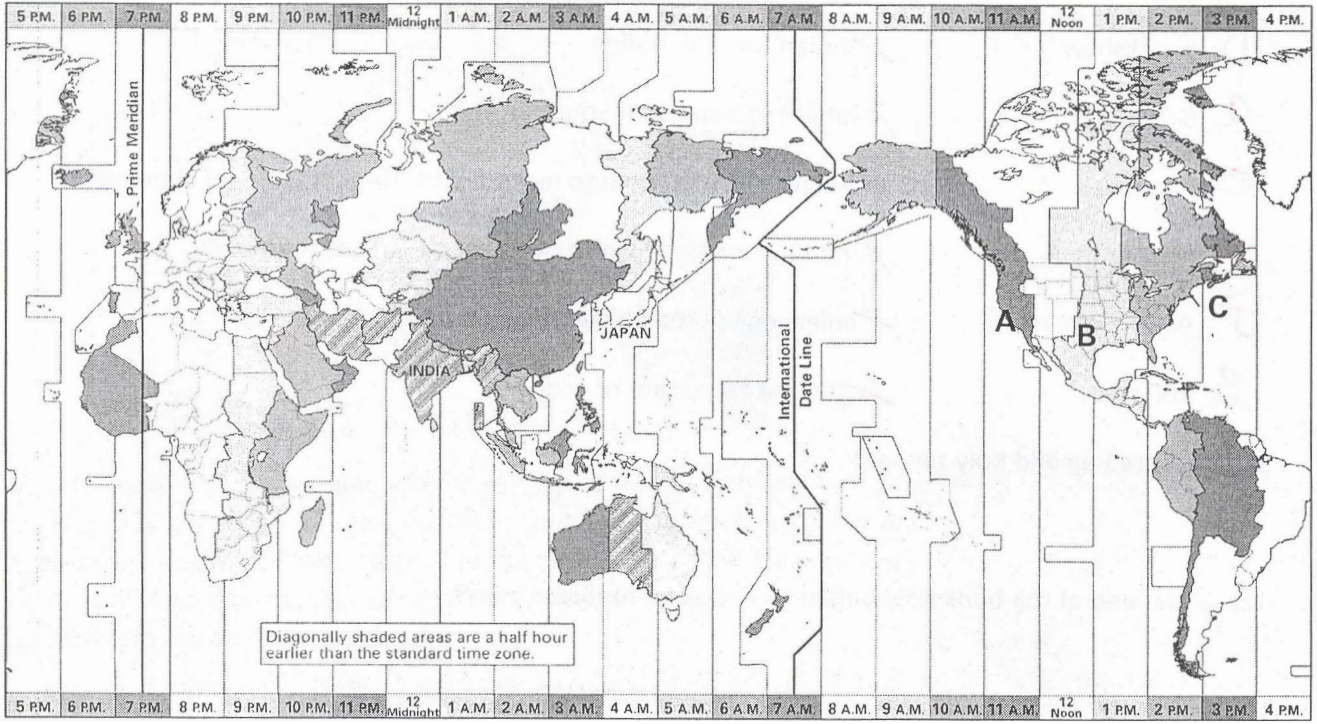
FAMOUS LANDMARKS AROUND THE WOrld

1. The Statue of Liberty in New Your: USA
2. The Eiffel tower in Paris: France
3. St. Basil's Cathedral in Moscow : Russia
4. The Great Sphinx at Giza, The Pyramids of Giza: Egypt
5. Neptune and the Place of Versailles: France
6. The Great wall of China : China
7. The Taj Mahal in Agra : India
8. Christ the Redeemer: Rio de Janeiro
9. Mecca: Saudi Arabia
10. Brandenburg Gate in Berlin: Germany
11. Acropolis of Athens: Greece
12. Niagara Falls : Border of Ontario (Canada) and New York (USA)
13. Angkor Wat : Cambodia
14. St. Peter's Cathedral : Vatican City
15. Mount Rushmore: South Dakota
16. The Grand Canyon : Arizona
17. Sydney Opera House : Australia
18. Forbidden City : Beijing
19. The Colosseum: Rome, Italy
20. The Empire State Building : New York
21. Abu Simbel : Egypt
22. Tower of Pisa : Italy
23. The Burj al Arab Hotel : Dubai
24. Stonehenge: Wiltshire, United Kindom
25. Big Ben : London

THE NATIONAL EMBLEMS OF DIFFERENT COUNTRIES

Country	Emblem	Country	Emblem
Australia	Kangaroo	**Bangladesh**	Water Lily
Barbados	Head of a Trident	**Belgium**	Lion
Canada	White Lily	**Chile**	Candor & Huemul
Denmark	Beach	**Dominica**	Sisserou Parrot
France	Lily	**Germany**	Corn Flower
Guyana	Canje Pheasant	**Hong Kong**	Bauhinia (Orchid Tree)
India	Lioned Capital	**Iran**	Rose
Ireland	Shamrock	**Israel**	Candelabrum
Italy	White Lily	**Ivory Coast**	Elephant
Japan	Chrysanthemum	**Lebanon**	Cedar Tree
Luxembourg	Lion with Crown	**Mongolia**	The Soyombo
Netherlands	Lion	**New Zealand**	Southern Cross, Kiwi, Fern
Norway	Lion	**Pakistan**	Crescent
Papua New Guinea	Bird of paradise	**Spain** **Sierra Leone**	Eagle Lion
Sri Lanka	Lion	**Sudan**	Secretary Bird
Syria	Eagle	**Turkey**	Crescent & Star
U.K.	Rose		

Time Zones Around the World



IMPORTANT DAYS OF THE YEAR

9th January: NRI Day

10th January: World Laughter Day

12th January: National Youth Day

15th January: Indian Army Day

23rd January: Netaji Subhash Chandra Bose's birth anniversary

24th January: National Girl Child Day

25th January: National Tourism Day

26th January: Republic Day

29th January: National Newspaper Day

30th January: Martyr's Day

2nd February: World Wetlands Day

4th February: World Cancer Day

13th February: World Radio Day

14th February: St. Valentine's Day

21st February: International Mother Language Day

28th February: National Science Day

8th March: International Women's Day and Mother's day

13th March: No Smoking Day

15th March: World Consumer Rights Day

22nd March: World Water Day

23rd March: World Meteorological Day

24th March: World Tuberculosis Day

27th March: World Theatre Day

2nd April: World Autism Awareness Day

7th April: World Health Day

18th April: World Heritage Day

22nd April: World Earth Day

25th April: World Malaria Day

30th April: World Jazz Day

1st May: International Labour Day

3rd May: World Asthma Day

5th May: World Athletics Day

8th May: International Red Cross Day

11th May: National Technology Day

17th May: World Telecommunications Day

20th May: World Refugee Day

21st May: Anti-terrorism Day

24th May: Commonwealth Day

31st May: World No Tobacco Day

1stJune: World Milk Day

5th June: World Environment Day

8th June: World Ocean Day

20th June: International Refugee Day

21st June: International Yoga Day

23rd June: International Olympic Day

27th June: World Diabetes Day

1st July: World Doctor's Day Van Mahotsav Week (1stJuly to 7thJuly)

11th July: World Population Day

26th July: Kargil Victory Day

28th July: World Hepatitis Day

29th July: International Tiger Day

30th July: International Day of Friendship

6th August: Hiroshima Day

12th August: International Youth Day

15th August: India's Independence Day

19th August: World Humanitarian Day

29th August: National Sports Day

5th September: Teacher's Day

8th September: International Literacy Day

14th September: Hindi Day

15th September: World Engineer's Day

16th September: World Ozone Day

18th September: International Day of Peace

21st September: Biosphere Day

24th September: Girl Child Day

25th September: Social Justice Day, World Maritime Day

27th September: World Tourism Day

1st October: International Music Day

2nd October: Gandhi Jayanti, International Non-Violence Day

3rd October: World Habitat Day

8th October: National Air force Day

9th October: World PostalDay National Postal Week (9thOctober to 14th October)

12th October: World Sight Day

16th October: World Food Day

31st October: National Integration Day

7th November: World Cancer Awareness Day

11th November: National Education Day

14th November: Children's Day

16th November: National Press Day

21st November: World Fisheries Day, World Hello Day, World Television Day

25th November: International Day for the Elimination of Violence against Women

26th November: National constitution day

26th November: National Milk day

30th November: Flag Day

3rd December: World Conservation Day

5th December: World Soil Day

7th December: Armed Forces Flag Day

9th December: International Day against Corruption, National Immunization Day

10th December: World Human Rights Day, International Broadcasting Day

11th December: UNICEF Day

14th December: National Energy Conservation Day

16th December: Vijay Diwas

22nd December: National Mathematics Day

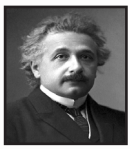
23rd December: Kisan Diwas (Farmers' Day)





MOST FAMOUS PEOPLE OF ALL TIME

Albert Einstein (14th March -1879 -April 18, 1955) : Albert Einstein was a German-born physicist who gave the theory of relativity. He is considered the most influential physicist of the 20th century and is best known for his mass–energy equivalence formula $E = mc^2$. He received the Nobel Prize in 1921 in Physics for his 'services to theoretical physics', in particular the discovery of 'the law of the photoelectric effect'.



Aristotle (384 BC - 322 BC) : Aristotle was a Greek philosopher and scientist born in the Macedonian city of Stagira, Chalkidice. He was one of the greatest intellectual figures of Western history. He was the author of a philosophical and scientific system that became the framework and vehicle for both Christian Scholasticism and medieval Islamic philosophy.

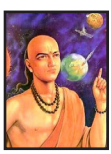
Adolf Hitler (20th April- April 30th 1945): Hitler was the leader of the National Socialist Party (from 1920/21) and chancellor (Kanzler) and Führer of Germany (1933–45). He initiated World War II and oversaw fascist policies that resulted in around 6 million deaths. Hitler committed suicide with wife Eva Braun on April 30, 1945, in his Berlin bunker.

Alexander the Great (356-323 BC): Alexander was the King (Basileus) of the Ancient Greek kingdom of Macedon and a member of the Argead dynasty. He went on to conquer Persia and Egypt, his kingdom ranging from the Mediterranean to the border of India. He died of malaria when he was 32. He is regarded as one of history's brilliant military leaders and most powerful rulers.

Abraham Lincoln (12th February, 1809- 15th April, 1865): Abraham Lincoln was the 16th President of the United States, serving from March 1861 until his assassination in April 1865. Lincoln led the United States through its Civil War—its bloodiest war and its greatest moral, constitutional and political crisis. In doing so, he preserved the Union, abolished slavery, strengthened the federal government, and modernized the economy.

Alfred Nobel (October 21, 1833-December 10, 1896): Alfred Nobel was a Swedish chemist, engineer, entrepreneur and industrialist, who invented dynamite and other, more powerful explosives. He had 355 patents to his name and posthumously his was assets were used to institute the Nobel Prizes.

Aryabhatta (476 CE-550 CE): Aryabhata was an acclaimed mathematician-astronomer, born in Kusumapura (present day Patna) in Bihar. He contributed immensely in the field of mathematics, science and astronomy. Some of his written works are 'Aryabhatiya' and Arya-siddhanta.



Ashoka the Great (August 304 BC- 232 BC): Ashoka was one of the greatest emperors of the Maurya dynasty. Ashoka renounced armed conquest and adopted a policy called 'conquest by dharma' and embraced Buddhism after witnessing the destruction caused during the Kalinga war.

Annie Besant (1st October 1847 – 20th September 1933): Annie Besant was a prominent British socialist, theosophist, women's rights activist, and a supporter of Irish and Indian self-rule. She was appointed as the first female President of the Indian National Congress in 1917.

Agatha Christie (15th September 1890 – 12th January 1976): Agatha Christie was a novelist, short story writer, playwright, and a poet. She is best known for her numerous detective novels and short story collections. She has also written the world's longest-running play, a murder mystery, The Mousetrap.

Azim Premji (24th July 1945): Azim Premji is a business tycoon, investorand philanthropist. He is the chairman of Wipro Limited. Premji owns 73% percent of Wipro and also owns a private equity fund called PremjiInvest.



Alberuni (4/5th September 973 – 13th December, 1048): Al-Biruni a Khwarezmian Iranian Muslim scholar and polymath was a great philosopher, mathematician and historian. In 1017 he travelled to the Indian subcontinent and authored 'Tarikh Al-Hind' (History of India) after exploring the Hindu faith practised in India. He is also called the 'founder of Indology'.

Andre Agassi (29th April, 1970-): Andre Agassi is an American tennis player. Agassi is an eight-time Grand Slam champion and a 1996 Olympic gold medallist in singles tennis. Agassi was nicknamed as 'The Punisher'.

Ang Dorjee (1970-): Ang Dorje (Chhuldim) Sherpa is a Nepali sherpa mountaineering guide, climber and porter from Pangboche, Nepal. He has climbed to the summit of Mount Everest 17 times, Cho Oyu seven times since 1995, Broad Peak (1995), Gasherbrum II (1997) and Ama Dablam (1996).

Amir Khusro (1253–1325 CE): Amir Khusro was a Sufi musician, poet and scholar. He is credited for the invention of the musical instruments like tabla and sitar. He is also regarded as the 'father of Qawwali'. He was associated with the royal empires of seven rulers of Delhi.



Anne Frank (12th June, 1929 – February 1945): Anne Frank was a German-born diarist and writer. She is one of the most discussed Jewish victims of the Holocaust. Her wartime diary 'The Diary of a Young Girl' has been the basis for several plays and films. She gained international fame posthumously after her diary was published.

Arnold Schwarzenegger (30th July, 1947-): Arnold Schwarzenegger is an Austrian-American actor, producer, director, activist, businessman, former professional bodybuilder, and politician. He was nicknamed the 'Austrian Oak' as bodybuilder and 'Arnie' as an actor. Schwarzenegger gained worldwide fame as a Hollywood action film icon with his movies like 'The Terminator', which was

a massive critical and box-office success. He appeared in a number of successful films, such as Commando (1985), Predator (1987), Total Recall (1990) and True Lies (1994). Schwarzenegger served two terms as the 38th Governor of California from 2003 until 2011.

Ala-ud-din Khilji (died 1316): Ala-ud-din Khilji was the second ruler of the Khilji dynasty (1296 to 1316). He is considered the most powerful ruler of the dynasty. He was a strategist and military commander who commanded forces across the Indian subcontinent. He is noted in history for being one of the few rulers in the world who repeatedly defended his empire against Mongol invasions. Alauddin died in January 1316, of oedema. It is said that his lieutenant Malik Naib hastened his death. His tomb and madrasa exist at the back of Qutb complex, Mehrauli, in Delhi.

Albert Camus (7th November 1913 – 4th January 1960): Albert Camus was a French philosopher and writer. Born in Algeria, he had French parents. In 1941, Camus wrote his first novel, which was called The Stranger. His other novels and plays include The Plague and The Fall. Camus also wrote books about philosophy (ways of thinking) which said that life was 'absurd' (makes no sense, or has no meaning). Camus won the Nobel Prize in Literature in 1957 and became the second youngest recipient of the Nobel Prize in Literature, after Rudyard Kipling. He died at an early age in an automobile accident on 4 January 1960.

Akbar (15 October 1542 – 27 October 1605): Akbar was third Mughal Emperor. He succeeded his father, Humayun, under a regent, Bairam Khan, at an early age of 13 years. He expanded his empire gradually covering nearly all of Indian Subcontinent north of Godavari river.



He was a great administrator and in order to preserve peace and order in a religiously and culturally diverse empire, he adopted policies that won him the support of his non-Muslim subjects. He promulgated Din-i-Ilahi.

Alexandre Gustave Eiffel (15th December 1832 – 27th December 1923): Alexandre Gustave Eiffel was a French civil engineer and architect. He graduated from the prestigious École Centrale des Arts et Manufactures, France usually associated with various bridges for the French railway network most famously the Garabit viaduct. He is best known for the world famous Eiffel Tower, built for the 1889 Universal Exposition in Paris, and his contribution to building the Statue of Liberty in New York. After his retirement from engineering, Eiffel concentrated on research into meteorology and aerodynamics. He died on 27th December 1923 in Paris, France.

Alfred Hitchcock (13th August 1899 – 29th April 1980): Sir Alfred Joseph Hitchcock was an English film director and producer. He was nicknamed as 'The Master of Suspense' as he was pioneer of many elements related to suspense and psychological thriller genres. He

pictured many successful silent films and early talkies. He was known as England's best director. Hitchcock directed more than fifty feature films in a career. He was named as the most influential filmmaker of all time by Movie Maker magazine in 2002. He died on 29 April, 1980 at Los Angeles in California.

Allan Border (27th July 1955-): Allan Border was an Australian former cricketer. His playing nickname was 'A.B.'. Throughout his career he played 156 Test matches. He still holds the world record of playing 153 test matches in a row and the number of Tests as captain. He was a left hand batsman but also performed well as a part-time left arm spinner. Border amassed 11,174 runs and 27 centuries in his Test career. He retired as Australia's most capped player and leading run-scorer in both Tests and ODIs.



Anand Burman (1986-): Dr. Anand C Burman is an Indian entrepreneur and chairman of Dabur. He is also the cofounder of Asian healthcare fund. He serves as a board of directors for 33 companies including Hero Motocorp, Aviva Life Insurance, Ester Industries and Interx Laboratories. He is the chairman of Fresenius Kabi Oncology Ltd and an Independent Non-Executive Director of Hindustan Motors Ltd. He has also invested in different sectors like healthcare and education. Sundesh, a non-profit organisation was set up by him. He joined his family business Dabur as manager in Research and Development department in 1980. He entered company's board in 1986 and became chairman in 2007. He became EY Entrepreneur of the Year 2011.

Angela Merkel (17th July 1954-) Angela Dorothea Merkel has been the Chancellor of Germany since 2005 and the Leader of the Christian Democratic Union since 2000. Before beginning her political career Merkel was a research scientist and got doctorate degree as a physical chemist from University of Leipzig. She became the spokesperson for the first democratically elected East German Government in 1990. In her political career, she served as Minister for Women and Youth in 1992, Minister for Environment in 1994 and was elected Secretary-General of the CDU in 1998. On 26 March 2014, she became the longest-serving head of government in the European Union. Currently she is the Senior G7 leader and ranked as most powerful woman of world by Forbes.

Anna Hazare (15th June, 1937-): Anna Hazare is a socialist who started movements to promote rural development, increase government transparency, investigations and punish corrupt. As a socialist he organises and encourages grassroots movements. He practises non-violence following the path of Gandhi. His strong agitation led to the development and structuring of Ralegan Siddhi, a village in Parner taluka of Ahmednagar district, Maharashtra. He also exerted pressure on the Indian government to enact on anti-corruption law and Lokpal Bill,



2011. He was awarded the Padma Bhushan in 1992 for his efforts in establishing Ralegan Siddhi village as a model for others.

Anil Dhirubhai Ambani (4th June 1959-): Anil Dhirubhai Ambani is a business tycoon and investor. He serves as the chairman of Reliance ADA Group. With a degree in MBA from Wharton, University of Pennsylvania he joined his family business, in 1983 as co-chief executive officer. After the death of his father he took hold of the Reliance Group with interests in Telecom, Entertainment, Financial Services, Power and Infrastructure. He has produced a large number of Bollywood films and is also associated with 44 FM radio stations, nationwide DTH business, animation studios, and several multiplex cinemas throughout India. Ambani's net wealth is estimated to be $5.9 billion according to the Forbes billionaire list for 2014. Business India in 1997 announced him to be 'Businessman of the Year 1997'. Then in 2004 he became the 'CEO of the Year 2004' in the Platts Global Energy Awards.

A. R. Rahman (6th January 1967-) : A. R. Rahman is a composer and songwriter. He is renowned for incorporate Eastern classical music with electronic music, world music and traditional orchestral arrangements. Rahman's film career began with a Tamil movie 'Roja'. Few of his well known films are Rangeela, Dil Se, Slum dog millionaire etc. His award list includes two Academy Awards, two Grammy Awards, a BAFTA Award, a Golden Globe, four National Film Awards, fifteen Filmfare Awards and thirteen Filmfare Awards (South). He is nicknamed as 'the Mozart of Madras' but Tamil commentators and fans call him Isai Puyal (the Musical Storm). Songlines magazine named him one of 'Tomorrow's World Music Icons' in August 2011.

Arundhati Bhattacharya (18th March 1956-): Arundhati Bhattacharya is the first woman Chairperson of State Bank of India. She started her career as a probationary officer by joining State Bank of India in 1977. She has served at various positions in the bank such as chief executive of the bank's merchant banking arm- State Bank of India Capital Markets; chief general manager in charge of new projects. Different projects which involved her were SBI General Insurance, SBI Custodial Services and the SBI Macquarie Infrastructure Fund. She has been termed as 30th most powerful woman in the world by Forbes and 4th most powerful woman in Asia Pacific by Fortune in 2015.



Aung San Suu Kyi (19th June 1945-): Aung San Suu Kyi is a politician and opposition leader of Myanmar. She is the chairperson of the National League for Democracy (NLD) in Burma. She was under house arrest since 20th July, 1989 till 13th November 2010 and became one of the world's most prominent political prisoners. She has been bestowed with Rafto Prize, Sakharov Prize for Freedom of Thought in 1990 and the Nobel Peace Prize in 1991. In 1992, government of India and government of Venezuela honoured

her with Jawaharlal Nehru Award for International Understanding and the International Simón Bolívar Prize respectively. Aung San Suu Kyi published her books known as 'Freedom from Fear, and Other Writings', and Letters from Burma (1997; reissued 2010).

Atal Bihari Vajpayee (25th December 1924-): Atal Bihari Vajpayee was the 10th Prime Minister of India. He was the first Prime Minister from outside the Indian National Congress party who served for a full tenure of 5 years. He was elected to Lok Sabha nine times from Lucknow constituency serving parliament for over four decades. In 2009, he retired from active politics due to his deteriorating health. He was appointed as a Minister of External Affairs in the cabinet of Morarji Desai. His birthday, 25 December, has been declared as 'Good Governance Day'. Bharat Ratna was given to him on 27th March 2015.



Amitabh Bachchan (11th October 1942-): Dubbed as India's first "angry young man" for his on-screen roles in Bollywood, Amitabh Bachchan gained popularity in the Hindi cinema with movies like Deewar and Zanjeer. He has since appeared in over 180 Indian films in a career spanning more than four decades. Bachchan is regarded as one of the greatest and most influential actors in the history of Indian cinema. He was awarded the Padma Shri in 1984, the Padma Bhushan in 2001 and the Padma Vibhushan in 2015.



Amartya Sen (3rd November 1933-): Amartya Sen is an Indian economist and philosopher. Sen is a professor of Economics and Philosophy at the Thomas W. Lamont University and the Harvard University. He was awarded the Nobel Memorial Prize in Economic Sciences in 1998 and Bharat Ratna in 1999 for his work in welfare economics.

Barack Obama (4th August, 1961-) Barack Obama is the 44th President of the United States of America. He is the first African American to serve as President of USA. He was awarded the Nobel Peace Prize in 2009.

Bob Dylan (24th May, 1941-): Bob Dylan is an American singer, artist and writer. 'Blowin' in the Wind', 'The Times They Are a-Changing' and 'Like a Rolling Stone' are some of his most popular songs. He received the Pulitzer Prize jury in 2008 and the Presidential Medal of Freedom from President Barack Obama in May 2012.

Bill Gates (28th October, 1955-): Bill Gates is an American business magnate, philanthropist, and computer programmer. In 1975, Gates co-founded Microsoft, the world's largest PC software company with Paul Allen, and subsequently became one of the richest men in the world.



Benito Mussolini (29th July 1883 – 28th April 1945): Mussolini was an Italian politician and dictator. He was the leader of the National Fascist Party and also considered the founder of fascism. He was executed by the Italian partisans when he was attempting to escape north.

Benazir Bhutto (21st June, 1953 – 27th December 2007): Benazir Bhutto was the 11th Prime Minister of Pakistan (1988–90 and 1993–96). Bhutto was assassinated in a bombing on 27th December 2007. Daughter of Destiny is the autobiography written by her.

Bachendri Pal (24th May 1954): Bachendri Pal, an Indian mountaineer, is the first Indian woman to scale the summit of Mount Everest in 1984. She has authored her autobiography 'Everest – My Journey to the Top'. She is also the recipient of Padma Shri (1984) and Arjuna award (1986).

Baichung Bhutia (15th December 1976-): Baichung Bhutia is a professional Indian footballer of Sikkimese-Bhutia descent. Bhutia is considered to be the torchbearer of Indian football in the international arena.



He is also India's most capped player, with 104 international caps to his name. He is honoured with the Arjuna Award and the Padma Shri for his contribution to Indian football.

Bob Hope (29th May, 1903 – 27th July, 2003): Bob Hope was a British-born American entertainer and comic actor known for his rapid-fire delivery of jokes and one-liners. He was successful in almost all entertainment media and toured overseas to entertain American troops. Hope was awarded five honorary awards by the Academy of Motion Picture Arts and Sciences.

Baba Ramdev (25th December, 1965-): Baba Ramdev is a spiritual leader. However, in recent years, his interest in politics and agriculture has grown. He was born as Ramkrishna Yadav in Haryana. He is best known for popularising yoga among Indians through his mass yoga camps. He also founded the Divya Yog Mandir Trust in 1995 for this purpose. The Patanjali Group of Institutions was established for the promotion and practice of yoga and ayurveda. Since 2003, he is being featured in morning yoga slot of Aastha TV. Ramdev has more recently become a vocal advocate on Indian political issues.



Bahadur Shah Zafar (28th September 1837 – 14th September 1857): Bahadur Shah Zafar was the last Mughal emperor and the successor of Akbar II. He was a poet, musician, and calligrapher. He had more of an aesthete bend than a political leader. His pen name was Zafar. He was a nominal Emperor, as the Mughal Empire existed in the name only and his authority was limited only to the city of Delhi. He played a part in the revolt of 1857. He was captured and exiled to Rangoon, Burma by the British.

Ban-ki-moon (13th June 1944-): Ban Ki-moon is the eighth and current Secretary-General of the United Nations. His diplomatic career started as soon as he graduated. Ban's first overseas posting was to New Delhi where he served as vice consul and impressed many of his superiors in the foreign ministry with his competence. He served as foreign minister of

South Korea, from January 2004 to November 2006. On 1 January 2007, he succeeded Kofi Annan. Ban diplomatically took strong outlook on global warming and issues related Darfur conflict. He was listed to be world's 32nd most powerful person by the Forbes in 2013 and first among South Koreans.

Banabhatta (601 – 649 AD): Banabhatta was a Sanskrit prose writer and poet in the court of King Harsha Vardhana. His principal works include a biography of Harsha (the Harshacharita), and one of the world's earliest novels, Kadambari. He died before finishing Kadambari and later it was completed by his son Bhusanabhatta. Both these works are distinguished texts of Sanskrit literature. His other works include the Chandikasataka and a drama, the Parvatiparinaya.

Bhagat Singh (September 28, 1907 - 23 March 1931): Bhagat Singh was an Indian socialist and a revolutionary. He was a leader of Hindustan Republican Association (HRA). Bhagat Singh killed John Saunders a police officer seeking revenge the death of Lala Lajpat Rai. All the efforts of police had failed to capture him. Then he along with his companion Batukeshwar Dutt surrendered to British police as they threw two bombs and leaflets which explained their motives, inside the Central Legislative Assembly. This led to his arrest and subsequently jailed on the charge of murder. He gained widespread support of people as he fasted for 116 days demanding equal rights for Indians prisoners. He was convicted and subsequently hanged for his participation in the murder at the age of 23 on 23 March, 1931 at Lahore.



Begum Khaleda Zia (15th August 1945-): Begum Khaleda Zia is a Bangladeshi politician who served as the Prime Minister of Bangladesh for two tenures (1991 to 1996 and 2001 to 2006). Her government attempted to tackle the country's economic problems by privatizing industry; improving educational system and expanding the economic opportunities available to women. She is the first woman of Bangladesh and second Muslim woman to head a democratic government as prime minister. She even became the First Lady of Bangladesh during her husband Ziaur Rahman's presidentship. At present she is he chairperson of the Bangladesh Nationalist Party (BNP). She is also known as Khaleda Majumdar and Khaleda Zia ur-Rahman.

Sir Ben Kingsley (31st December 1943-): Sir Ben Kingsley is an English actor who is known for his role as Gandhi in film Gandhi (1982). He got Academy Award for Best Actor for playing this role. In a career of 40 years, he has won an Oscar, a Grammy, a BAFTA, two Golden Globes and Screen Actors Guild awards. He is also known for his performances in the films Schindler's List (1993), Sexy Beast (2000), Lucky Number Slevin (2006), Shutter Island (2010), Prince of Persia: The Sands of Time (2010), Hugo (2011), and Iron Man 3 (2013). Kingsley was made a Commander of the Order of the British Empire in 2000, and a Knight Bachelor in 2002. In 2013 he received the

BAFTA Los Angeles Britannia Award for Worldwide Contribution to Filmed Entertainment.

Bill Clinton (August 19, 1946-): Bill Clinton is an American politician who served as the 42nd President of the United States from 1993 to 2001. He served as Governor of Arkansas from 1979 to 1981 and 1983 to 1992, and as Attorney General of state from 1977 to 1979. He created the William J. Clinton Foundation addressing international causes such as prevention of AIDS and global warming. In 2004, he published his autobiography My Life. In 2009, he was named as United Nations Special Envoy to Haiti, and after the 2010 Haiti earthquake he teamed with George W. Bush to form the Clinton Bush Haiti Fund.



Bimal Jalan (17 August 1941-): Bimal Jalan is a former Governor of Reserve Bank of India and a nominated member of the Rajya Sabha (2003–2009). He held several administrative and advisory positions in the government, namely, Chief Economic Adviser in the 1980s, Banking Secretary (1985-1989) and Finance Secretary, Ministry of Finance. The government reappointed Jalan as Governor of the Reserve Bank of India, firstly between 22 November 2000 to 21 November 2002 and again commencing from 22 November 2002 and ending 21 November 2004. He is the writer of many books such as 'The Future of India', 'India's Politics: A View from the Backbench', 'The Future Of India: Politics, Economics, And Governance', 'The Indian Economy: Problems And Prospects', 'India's Economic Policy', 'Emerging India: Economics, Politics and Reforms' and 'India's Economic Crisis: The Way Ahead'.



Binny Bansal (17th August 1941-): Binny Bansal is a co-founder of e-commerce platform Flipkart with Sachin Bansal in 2007. He worked with Sarnoff Corporation for 1.5 years where he developed a lane sensor device for cars. Then before getting rejected by Google twice, he was associated with Amazon. There he realized that the market for E-commerce in India was very small and led the foundation of Flipkart. There he serves as the Chief Operating Officer.

Bhisham Sahni (8 August 1915 – 11 July 2003): Bhisham Sahni was a Hindi writer, playwright, and actor. He was awarded the Padma Bhushan for literature in 1998 and Sahitya Akademi Fellowship in 2002. He made his appearance in films like Saeed Mirza's Mohan Joshi Hazir Ho! (1984), Tamas (1986), Bernardo Bertolucci's Little Buddha (1993) and Aparna Sen's Mr. and Mrs. Iyer (2002). His novel and television screenplay Tamas ('Darkness, Ignorance') is a powerful and passionate account of the Partition of India which in1975, won Sahitya Akademi Award for literature. Two of his masterpiece stories, 'Pali' and 'Amritsar Aa Gaya Hai', also elaborate the time of partition. His other famous Hindi novels include Jharokhe (1967), Kadian (1971),

Basanti (1979), Mayyadas Ki Madi (1987), Kunto (1993) and Neeloo, Nilima, Nilofar (2000). He died on July 11, 2003, Delhi.

Birbal (1528–1586): Raja Birbal, was an advisor in the court of the Mughal Emperor Akbar. He was appointed as a poet and singer in around 1556–1562. He was considered one of the navaratnas or nine jewels in the court of Emperor Akbar. The folk tales of India has made him famous as he influenced Akbar by his witticism. In 1586, Birbal led an army to crush conflict in the north-west Indian subcontinent, which failed tragically when he was killed along with many troops, in an ambush by the rebel tribe.

Brijmohan Mishra (4 February 1938-): Birjumohan Maharaj is the leading exponent of the Lucknow Kalka-Bindadin gharana of Kathak dance in India. He is a descendant of the legendary Maharaj family of Kathak dancers. Even though dancing is his first love, he also has an excellent command over Hindustani classical music and is an accomplished vocalist as well. He took Kathak to new heights by choreographing new Kathak dance dramas. He remained as the head of Bhartiya Kala Kendra (Kathak Kendra) New Delhi till his retirement in 1998. Then after retirement he opened his own dance school, Kalashram, in Delhi. He received Lata Mangeshkar Puraskaar in 2002 and National Film Award for Best Choreography Vishwaroopam (2012).



Bismillah Khan (21 March 1913 – 21 August 2006): Ustad Bismillah Khan was an Indian musician credited with popularizing the shehnai. Khan is credited with elevating shehnai's status and bringing it to the concert stage. He was awarded India's highest civilian honour, the Bharat Ratna, in 2001. He became the third classical musician after M. S. Subbulakshmi and Ravi Shankar to receive such an honour. He was awarded the Padma Vibhushan way back in 1968 for his contribution in Indian classical music. He died on 21 August 2006, at Varanasi due to a cardiac arrest.



Brijmohan Lall Munjal (1st July, 1923-1st November 2015): Brijmohan Lall Munjal is the founder of Hero Group. He is considered as a prominent figure of Indian two-wheeler industry. Hero cycle was officially born in 1956 at Ludhiana. Before 1956 he along with his four brothers was engaged in bicycle spare parts business. Hero MotoCorp remained as world's largest two-wheeler company for 14 years in a row. In 1984, Hero joined hands with Honda a Japanese company and became the world's single-largest motorcycle maker. This partnership ended in 2011. He was awarded Padma Bhushan in 2005 and Lifetime Achievement for the Asia Pacific Entrepreneurship in 2011. He died on 1 November 2015 in New Delhi.

B. K. S. Iyengar (14th December 1918 – 20th August 2014): B.K.S Iyengar was one of the most renowned Yoga gurus in the world. He is also known the founder of the style of yoga known as "Iyengar Yoga". Iyengar was one of the contemporaries of the Tirumalai Krishnamacharya, who is often referred to as "the father of modern yoga". His most popular books include 'Light on Yoga', 'Light on Pranayama' and 'Light on the Yoga Sutras of Patanjali'. He has been awarded the Padma Shri (1991), the Padma Bhushan (2002) and the Padma Vibhushan (2014).



Charles Darwin (12th February, 1809- 19th April 1882): Charles Darwin was an English naturalist and geologist, is best known for his work as a naturalist, developing a theory of evolution to explain biological change. His studies of specimens around the globe led him to formulate his theory of evolution and his views on the process of natural selection. In 1859, he published On the Origin of Species. He died on 19 April 1882 at the age of 73 at Kent, England.

Christopher Columbus (1451-1506): Christopher Columbus was an Italian explorer who sailed across the Atlantic Ocean in 1492, hoping to find a route to India (in order to trade for spices). He made a total of four trips to the Caribbean and South America during the years 1492-1504.

Charles Dickens (7th February, 1812- 9th June, 1870): Charles Dickens was an English novelist, and considered the greatest of the Victorian era. Some of his notable works are Oliver Twist, A Christmas Carol, Bleak House, David Copperfield, A Tale of Two Cities and Great Expectations.

Charlie Chaplin (16th April, 1889- 25th December, 1977): Charlie Chaplin, a British comedian, producer, writer, director, and composer is widely regarded as the greatest comic artist of the screen and one of the most significant figures in motion picture history.



Chanakya (350 – 275 BCE): Chanakya was a philosopher, economist and royal advisor to the Maurya Empire. He is also known as Kautilya or Vishnu Gupta. He authored the Arthashastra (Economics). He served as the chief advisor to Emperor Chandragupta and his son Bindusara.

Chandragupta Maurya (340 BCE – 297 BCE): Chandragupta Maurya was the founder of the Maurya Empire. He became the first emperor to unite most parts of India into one secular state. Chandragupta was succeeded his throne by his son Bindusara.

Charlotte Bronte (21st April 1816 – 31st March 1855): Charlotte Bronte was an English novelist and poet. She is best known for her novel Jane Eyre and published most of her works under the pen name Currer Bell.

Chinua Achebe (16th November 1930 – 21st March 2013): Chinua Achebe was a Nigerian novelist, poet, and professor. His debut novel Things Fall Apart (1958) is considered his greatest work. He was awarded the Man Booker International Prize (2007) and the Dorothy and Lillian Gish Prize (2010).

Charles Babbage (26th December 1791 –18th October 1871): Charles Babbage was a mathematician, philosopher, inventor and mechanical engineer. He is also known as the 'father of the computer' for inventing the first mechanical computer.

Cyrus Mistry (4th July 1968-): Cyrus Pallonji Mistry is an eminent Irish entrepreneur and the current Chairman of India's largest conglomerate, Tata Group of Companies. The Economist has described him as 'the most important industrialist' in both India and Britain. He is the youngest son of Indian construction magnate Pallonji Mistry.

Chanda Kochhar (17th November, 1961-): Chanda Kochhar is the managing director and chief executive officer of ICICI Bank. It is India's second largest commercial bank and the largest in the private sector. She started her career in Industrial Credit and Investment Corporation of India (ICICI) as a management trainee in 1984. It was after ten years she became Assistant General Manager (1994) and Deputy General Manager in 1996. She joined Board of Directors of ICICI Bank in 2001. Under Kochhar's leadership, ICICI received 'Best Retail Bank in India' award in 2001, 2003, 2004 and 2005. Kochhar was selected in Time magazine's list of the 100 Most Influential People in the World 2015.



Chhatrapati Shivaji (9 February, 1630 -3 April 1680): Chhatrapati Shivaji was the king of Raigad. He was of Bhonsle Maratha clan and famous for his rivalry with Aurangzeb. The Muslim oppression and religious harassment on Hindus was witnessed by him since an early age. At the age of 16, he got ready to fight for this cause and pursued it throughout his life. He was famous for his gorilla war and won a number of battles against Mughals following this practice.



Charles Lamb (10 February 1775 – 27 December 1834): Charles lamb was a writer and an essayist. He is best known for his Essays of Elia and the children's book Tales from Shakespeare. He was a member of literary circle in England. He published his first poem in 1796. His best-known poem is 'The Old Familiar Faces' (1789), although 'On an Infant Dying As Soon As It Was Born' (1828) is his finest poetic achievement. In 1792 Lamb worked as a clerk at East India House and got retirement in 1825. He died Dec. 27, 1834, in Edmonton, Middlesex, England.

Christine Lagarde (1 January 1956-): Christine Lagarde is a French lawyer and the Managing Director (MD) of the International

Monetary Fund (IMF) since 5 July 2011. In past she worked for French Government as a Minister of Economic Affairs, Finance and Employment, before that as a Minister of Agriculture and Fishing (2007) and Minister of Trade (2005) in the government of Dominique de Villepin. She has the honour of being first woman finance minister of a G8 economy and first woman to head the IMF. On 16 November 2009, the Financial Times ranked her the best Minister of Finance in the Eurozone.

Cleopatra (69- 12th August, 30 BC): Cleopatra was the Egyptian queen succeeding her father Ptolemy XII. She ruled from 51- 30 BC successively with her two brothers Ptolemy XIII (51–47) and Ptolemy XIV (47–44) and her son Ptolemy XV Caesar (44–30). She is considered to be last active pharaoh. After her reign Egypt went into the hands of Roman Empire under the kingship of Octavian. She committed suicide at the age of 39 on 12th August, 30 BC. She remained as a queen for 22 year.

Cyrus S. Poonawalla (1945-): Cyrus S. Poonawalla is the chairman of Poonawalla Group. This group includes a biotech company that manufactures paediatric vaccines. Forbes ranked him the 9th and 208th richest person in India and world respectively. He was awarded the Padma Shri in 2005 for his contribution in medicine. His interest in horse racing made him the chairman of the Royal Western India Turf Club. At the early age he has also experimented with cars and built sports car modelled on the D-type Jaguar.



Dr. B. R Ambedkar (14th April, 1891- 6th December 1956): Dr B. R. Ambedkar also popularly known as Babasaheb Ambedkar, was one of the architects of the Indian Constitution. He was awarded the Bharat Ratna posthumously in 1990. He was the nation's first law minister in the cabinet of Jawaharlal Nehru.

Dr APJ Abdul Kalam (15th October 1931- 27th July, 2015): A scientist and an administrator, APJ Abdul Kalam served as the 11th President of India from 2002 until 2007. He was popularly tagged as the 'Missile Man of India' and was honoured with great laurels and awards like Padma Bhushan, Padma Vibhushan and Bharat Ratna.

Dhirubhai Ambani (28th December, 1932- 6th July, 2002): Dhirubhai Ambani was an Indian business tycoon and visionary. He was the founder of Reliance Industries Limited, established in 1966. Dhirubhai was named the 'Man of 20th Century' by the Federation of Indian Chambers of Commerce and Industry (FICCI).



Dalai Lama (17th November 1950-): The 14th Dalai Lama (Tenzin Gyatso) is the current Dalai Lama. He received the Nobel Peace Prize in 1989. Dalai Lamas are the monks of the Gelug School which is the newest school of Tibetan Buddhism, nominally headed by the Ganden Tripas.

Dhyan Chand (29th August, 1905- 3rd December, 1979): Dhyan Chand was one of the greatest hockey players of all time. He was the member of the team which won three Olympic gold medals in the years 1928, 1932 and 1936. Dhyan Chand was nicknamed as 'The Wizard' owing to his superb ball control. He was awarded the Padma Bhushan in 1956.

Dev Anand (26th September 1923 – 3rd December 2011): Dev Anand was an actor, writer, director and producer. He was awarded the Padma Bhushan (2001) & the Dadasaheb Phalke Award (2002) for his contribution to Indian cinema. His career spanned more than 65 years with working in 114 Hindi films and 2 English films.



Dr. C.V. Raman (7th November 1888 – 21st November 1970): Chandrasekhara Venkata Raman was an Indian Physicist. He won the Nobel Prize in Physics in 1930 for his ground breaking work on the scattering of light and for the discovery of the Raman Effect. India celebrates National Science Day on 28th February to commemorate his discovery of the Raman Effect. He was awarded the Bharat Ratna in 1954.

Dr Rajendra Prasad (3rd December 1884 – 28th February 1963): Dr Rajendra Prasad was an Indian politician and lawyer. He was the first president of Independent India. He was the President of the Constituent Assembly that drafted the Indian Constitution.

Don Bradman (27th August 1908 – 25th February 2001): Don Bradman was a legendary Australian cricketer and is acknowledged as the greatest Test batsman of all times. During his test career, his batting average was a staggering 99.4 which is often highlighted as one of his greatest achievement.

Dadabhai Naoroji (4 September 1825- 30, June 1917): Dadabhai Naoroji is known as the Grand Old Man of India. He is an early Indian political and social leader known for criticising British economic policy in India. He was an intellectual, educator and Parsi cotton trader. He presided over the annual sessions of the Indian National Congress, in 1886, 1893, and 1906. He remained as a member of Liberal Party between 1892 and 1895. He was the first Indian to be a British MP. He is well known for his writing skills and wrote number of books of which Poverty and Un-British Rule in India became most famous.

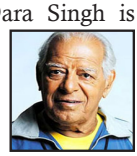
David Beckham (2nd May, 1975-): David Beckham is a professional English soccer player. He is the first English player to win league titles in four countries: England, Spain, the United States and France. Beckham announced his retirement in May 2013 after a 20-year career, during which he won 19 major trophies.



David Cameron (9th October, 1966-): David Cameron is the 53rd Prime Minister of Britain since 2010. He is the youngest Prime Minister ever since 1812. He is leader of the Conservative Party since 2005 and has been working as the Member of Parliament for Oxfordshire constituency of Witney since 2001. After Winston Churchill of Conservative Party during Second World War he is the only one to form coalition government. His government introduced Welfare Reform Act of 2012, the Education Act of 2011, the Health and Social Care Act of 2012 and the Immigration Act of 2014. In 2011 he became the first British Prime Minister to 'veto' an EU treaty. He received Order of Abdulaziz al Saud Medal of Excellence in 2012.



Dara Singh (19th November, 1928-12th July, 2012): An Indian wrestler and actor, Dara Singh is famous for his signature role of Hanuman in Ramayana (1987–88). His debut Bollywood movie was Saat Samundar Paar in 1967. He even directed and produced a number of movies. Imtiaz Ali's Jab We Met marked the last movie of his career. In 1996 he was inducted into the Wrestling Observer Newsletter Hall of Fame. His wrestling earned him two titles: Rustam-E-Punjab in 1966 and Rustam-E-Hind in 1978. He announced his retirement from active wrestling in 1983. From August 2003 to August 2009 he was a member of Rajya Sabha. He passed away on 12 July 2012 in Mumbai following a protracted illness.



Derek Walcott (23rd January 1930-): Derek Walcott is a Professor of Poetry at the University of Essex. In 1992 he received Nobel Prize in Literature. Other renowned awards bestowed on him were 2011 T. S. Eliot Prize and 2015 Griffin Trust for Excellence in Poetry Lifetime Recognition Award. His few of the famous works include Dream on Monkey Mountain and Other Plays (1970), Omeros (1990), Tiepolo's Hound (2000) and White Egrets (2010). He laid down the foundation of Boston Playwrights' Theatre in 1981.

Desmond Tutu (7th October, 1931-): Desmond Tutu is an African Archbishop who received the Nobel Prize for Peace for his role in the opposition to apartheid in South Africa. From 1972 to 1975 he served as an associate director for the World Council of Churches. He has campaigned to fight HIV/AIDS, tuberculosis, poverty, racism, sexism, the imprisonment of Chelsea Manning, homophobia and transphobia. He received the Nobel Peace Prize in 1984; the Albert Schweitzer Prize for Humanitarianism in 1986; the Gandhi Peace Prize in 2007; and the Presidential Medal of Freedom in 2009.

Dilip Shanghvi (1st October 1955-): Dilip Shanghvi is the founder and managing director of Sun Pharmaceutical Industries

Ltd. He is one of the richest businessmen in India. He started his career by helping his father in his wholesale generic drugs business in Kolkata. In 1997, he acquired USA, Caraco Pharma and Israel's Taro Pharma in 2007 and brought Sun Pharmaceuticals to fifth place in the global generic drugs market. On 19 February 2015, he is said to surpass Mukesh Ambani as the richest person of India. He won CNN-Indian Broadcasting Network's Indian of the Year award, 2011 in the business category.

Dr. Vikram Ambalal Sarabhai (12th August 1919 – 30th December 1971): Vikram Ambalal Sarabhai an Indian scientist who is widely regarded as the father of India's Space Programme. He received Padma Bhushan in 1966 and Padma Vibhushan in 1972. He built a number of institutions like the Physical Research Laboratory (PRL), Indian Institute of Management (IIM), Ahmedabad; Vikram Sarabhai Space Centre, Thiruvananthapuram; Electronics Corporation of India Limited (ECIL), Hyderabad and many eminent institutes. Establishment of Indian Space Research Organization (ISRO) in 1962 was one of his greatest achievements. He died on 30 December, 1971 in Kovalam.



Elvis Presley (8th January, 1935 –16th August 1977): Elvis Presley was a musician and actor. He is often referred to as the King of Rock and Roll. He has won three Grammys and also received the Grammy Lifetime Achievement Award at the age of 36. He acted in films such as Blue Hawaii (1961), Girls! Girls! Girls! (1962), and Viva Las Vegas (1964).

Edgar Allan Poe (19th January, 1809 –7th October 1849): Edgar Allan Poe was an American writer, editor, and literary critic. He is considered to be the inventor of detective and science fiction. Some of his famous works include 'The Raven', and 'The Fall of the House of Usher.'

Edmund Hillary (20th July, 1919 – 11th January 2008): New Zealand mountain climber Edmund Hillary was the first to reach the summit of Mount Everest. He also explored Antarctic (South Pole) in 1958. He began climbing south Alps when in high school only. He served the Royal New Zealand Air Force as a navigator during World War II. From 1985 to 1988 he served as New Zealand's high commissioner to India, Nepal, and Bangladesh. The second-highest mountain range on Pluto is named in his honour as Hillary Montes. He was added to the UNESCO Memory of the world archive in 2013. Hillary was named by Time as one of the 100 most influential people of the 20th century. He died on 11 January 2008, in Auckland. In 2003, he was made an honorary citizen of Nepal as a part of observance of the 50th anniversary of his climbing to Mount Everest.



Edmund Spenser (1552/53- 13th January 1599): Edmund Spenser was an English poet known for long allegorical poem. Spenser is called as a Poets' Poet. His famous work 'The Faerie Queene' came to be known as Spenserian stanza. It was a long epic explaining the Tudor dynasty and Elizabeth I. He is said to be a craftsman of nascent Modern English verse and is considered as one of the greatest poets in the English language. He died on 13 January, 1959 in London.

Elizabeth Taylor (27th February, 1932- 23rd March 2011): Oscar winning Elizabeth Taylor started her career as a child actress when MGM Studios signed her to cast in Lassie Come Home (1943). She is considered as a last star of classical Hollywood cinema and even regarded as one of the first modern celebrities. She won the Academy Award twice for her performance in Butterfield 8 (1960) and Who's Afraid Of Virginia Woolf (1966). One of her most famous roles was in Cleopatra (1961). She was the first celebrity to take part in HIV/AIDS activism in 1984. She co-founded the American Foundation for AIDS Research (amfAR) in 1985 and The Elizabeth Taylor AIDS Foundation in 1991. She was honoured by the queen of England in 1999 as Dame Elizabeth Taylor. She died on 23rd March, 2011.



Edward Joseph Snowden (21st June 1983-): Edward Joseph Snowden is a computer professional who copied classified information from the United States National Security Agency (NSA) and United Kingdom Government Communications Headquarters (GCHQ) while working in CIA. These informations were related to numerous global surveillance programs, many run by the NSA and Five Eyes with the cooperation of telecommunication companies and European governments. In June 2013, he gave these classified NSA and GCHQ documents to journalists Glenn Greenwald, Laura Poitras and Ewen MacAskill who published it in The Guardian on 6th June, 2013. Right now he stays as a refuge in an undisclosed location in Russia, seeking for asylum elsewhere. A documentary on his story, Citzenfour, won an Oscar in 2015.

Elattuvalapil Sreedharan (12 June 1932-): A retired Indian Engineering Service officer Elattuvalapil Sreedharan is popularly known as the 'Metro Man'. He is credited with the leadership of building the Konkar Railways and bringing Metro to Delhi. In 1970, he worked as the deputy chief engineer of the first ever metro in India, Kolkatta. He worked as a managing director of Delhi Metro between 1995–2012. Sreedharan was appointed as Principal Advisor of the Kochi Metro Rail Project after retiring from Delhi Metro. He was awarded the Padma Shri by the Government of India in 2001, the Padma Vibhushan in 2008, the Chevalier de la Légion d'honneur in 2005. He served in a High level Advisory Group on Sustainable Transport (HLAG-ST) by United Nation for the period of three year.

Ferdinand Magellan (1480 – 27 April 1521): Magellan was a Portuguese explorer who organised the Spanish expedition in which he assembled a fleet of ships which despite huge setbacks and Magellan's death, accomplished the first circumnavigation of Earth in a single voyage.



Franklin D. Roosevelt (30th January, 1882-12th April, 1945): Franklin D. Roosevelt, commonly known as FDR was an American statesman and political leader who served as the 32nd President of the United States. Assisted by his top aide Harry Hopkins, and with very strong national support, he worked closely with British Prime Minister Winston Churchill and Soviet leader Joseph Stalin in leading the Allies against Nazi Germany, Fascist Italy and Imperial Japan in World War II. He is often rated by scholars as one of the top three U.S. Presidents, along with Abraham Lincoln and George Washington.

Fa-hien (399-414 AD): Fa-hien was a Chinese Buddhist monk, pilgrim traveller, and writer, author of one of the earliest and most valuable Chinese accounts of India. He travelled India during the reign of Chandragupta II.

Fidel Alejandro Castro Ruz (13th August, 1926-): Fidel Alejandro Castro Ruz, is a political leader of Cuba who won the Confucius Peace Prize 2014, for his important contributions in eliminating nuclear war after his retirement. He is politically a Marxist–Leninist and Cuban nationalist. He served as Prime Minister of Cuba from 1959 to 1976. In 1976 he became President of Cuba and relinquished the presidency in February 2008 because of health problems. Ever since, he has been engaged meeting the leaders of world emphasizing the need to eliminate nuclear war. Castro was the Secretary-General of the Non-Aligned Movement from 1979 to 1983 and from 2006 to 2008.

Florence Nightingale (12th May 1820 – 13th August 1910): Florence Nightingale was a celebrated English social reformer and statistician, and the founder of modern nursing. She was often referred to as 'The Lady with the Lamp' because she used to make rounds of wounded soldiers at night during the Crimean War.

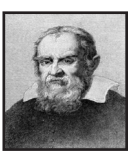


Firdausi (934-1020): Firdausi is known for his contribution to Persian poetry. He wrote one of the greatest national epics in world literature. Firdausi was the pen name of the poet called as Mansur ben Hasan according to al-Bundari. He studied philosophy, astronomy, poetry, and astrology. His remarkable work Shahnameh (Books of King), consists of epic of nearly 60,000 couplets. It covers the history of Iran covering four dynasties, the Pishdadian, the Kayanian, the Ashkanian, and the Sassanian. He died in 1020–26, in Iran.

Francis Xavier (7th April 1506 – 3rd December 1552): Francis Xavier was the co-founder of the Society of Jesus. He was a doctorate in law at the University of Bologna and severed as privy counsellor and finance minister to King John III of Navarre. Francis studied theology and arrived in Goa, then capital of Portuguese India on 6 May 1542. Francis Xavier devoted much of his life to missions in Asia, mainly in four centres: Malacca, Amboina and Ternate, Japan, and China. He died on 3 December, 1552 at Shangchuan and was buried there. His relics are kept in a silver casket, elevated inside the Bom Jesus Basilica, Goa.



Galileo Galilei (15th February 1564 – 8th January 1642): Galileo was an Italian astronomer, physicist, engineer, philosopher and mathematician who played a major role in the scientific revolution during the Renaissance. Galileo has been called the 'father of modern observational astronomy' and the 'father of modern physics' and 'the father of modern science'.



George Washington was the first President of the United States, the Commander-in-Chief of the Continental Army during the American Revolutionary War, and one of the Founding Fathers of the United States. He presided over the convention that drafted the United States Constitution, which replaced the Articles of Confederation. Washington was unanimously elected President by the electors in both the 1788–1789 and 1792 elections.

Genghis Khan (1162- 18th August, 1227): Genghis Khan was the founder and Great Khan (emperor) of the Mongol Empire, which became the largest contiguous empire in history after his demise. Many people were slaughtered in Genghis Khan's invasions, but he granted religious freedom to his subjects, abolished torture, encouraged trade and created the first international postal system.

George Orwell (25th June 1903- 21st January 1950): George Orwell was one of the sharpest satirical fiction writers of the 20th century with works such as Animal Farm and Nineteen Eighty-Four, the latter a profound anti-utopian novel that examines the dangers of totalitarian rule. He was a man of strong opinions who addressed some of the major political movements of his times, including imperialism, fascism and communism.

Geoffrey Chaucer (1343 – 25th October 1400): Chaucer was one of the greatest English poets of the Middle Ages. The Canterbury Tales was his best known and most acclaimed work. He is also known as the Father of English Literature.

Graham Bell (3rd March, 1847 –2nd August, 1922): Graham Bell was a Scottish inventor, engineer and innovator. He was one of the primary inventors of the telephone and did some groundbreaking work

in the field of communication for the deaf. He held more than 18 patents.

Gamal al-Ghitani (9th May 1945 – 18th October 2015): Gamal al-Ghitani was an Egyptian historical and political novelist. He was also involved in cultural and political commentaries. He served as the editor-in-chief of the literary periodical Akhbar Al-Adab ('Cultural News') till 2011. He started writing at the early age and published his first short stories at the age of 14. He was trained to be a carpet designer and even received diploma in it, in1962. Gamal was imprisoned from October 1966 through March 1967 for his critical commentary on the regime of Gamal Abd el-Nasser (President of Egypt). In 1969 he switched career and became a journalist for the Egyptian newspaper Akhbar El Yom ('The Day's News'). In 1980, he was awarded with the Egyptian National Prize for Literature, and in 1987, the French Chevalier de l'Ordre des Arts et des Letters. He died on 18 October 2015 in Cairo, Egypt at the age of 70 years.

Garry Kasparov (13th April, 1963): Garry Kasparov began playing chess at the age of 6 and became Soviet youth champion at 13. He won his first international tournament at age of 16 in 1979. Kasparov had the title of international grandmaster in 1980. In twenty years of time (1986 - 2005) he was ranked world No. 1 for 225 out of 228 months. Kasparov also holds records for consecutive professional tournament victories (15) and Chess Oscars (11). He took his retirement from chess world in 2005.

George Eliot (22 November 1819 – 22 December 1880): George Eliot was as English Victorian novelist. She is known as Marian Evans and Marian cross. She developed the method of psychological analysis characteristic of modern fiction. Her major works include Adam Bede (1859), The Mill on the Floss (1860), Silas Marner (1861), Middlemarch (1871–72), and Daniel Deronda (1876). The Death of Moses, 1879, From a London Drawing Room and Count That Day Lost were few of hers poems she wrote. She is known to be writing with a politically astute pen. She died on 22 December 1880 in Chelsea, Middlesex, England.

Girish Karnad (19th May 1938-) Girish Karnad is an Indian actor, film director, writer and playwright. He predominantly worked for South Indian cinema but his contribution to Bollywood is also remarkable. His started his career as a playwright in 1960s. His plays are mostly based on history and mythology to tackle contemporary issues. He wrote his first play, Yayati (1961) followed by Tughlaq (1964) which is regarded as his best works. His Hindi movies are Iqbal (2005) and Dor (2006) as an actor. He directed Utsav in 1984. He played a role of Swami's Father in Malgudi Days (1987). He served as the director of Film and Television Institute of India (1974–1975) and chairman of the Sangeet Natak Akademi, (1988–93). He is a recipient of many awards such as Padma Shri (1974), Padma Bhushan (1992) and Jnanpith Award (1998).



Graham Greene (2 October 1904 – 3 April 1991): Graham Greene was an English novelist and author regarded as one of the greatest writers of the 20th century. He worked as a private tutor for some time and then turned to journalism. He first joined the Nottingham Journal then shifted to Times as a sub-editor. His first published work was a book of verse, 'Babbling April' in 1925. Then his first novel came out in 1929 'The Man Within'. He got his first true success with the publication of 'Stamboul Train' in 1932. He wrote thriller stories. The Third Man, the Ministry of Fear and Brighton Rock were few of his novels which were later filmed. He died in 1991 at age of 86 of leukaemia, in Vevey, Switzerland.

Gulzari Lal Nanda (4th July 1898 – 15th January 1998): Gulzari Lal Nanda acted as the interim Prime Minister of India twice. Firstly in 1964 he succeeded Jawarhal lal Nehru after his death and second time after the death of Lal Bahadur Shastri in 1966. Nanda initiated his career as a research scholar working on labour problems at Allahabad University (1920–1921), and became a Professor of Economics at National College in Bombay (Mumbai) in 1921. In 1922, he became the secretary of the Ahmedabad Textile Labour Association and worked there till 1946. He took part in non-corporation and was imprisoned for Satyagraha in 1932, and 1942 to 1944. He was awarded the Bharat Ratna in 1997. He died on 15 January, 1998, Ahmadabad, Pakistan.



Guru Nanak (15 April, 1469-1539): Guru Nanak was the first Guru of the Sikhs. He has been regarded as 'one of the greatest religious innovators of all time'. He travelled extensively preaching the concept of 'One' God dwells in every one of his creations. Through his preaching he set up a unique spiritual, social, and political platform based on equality, fraternal love, goodness, and virtue. He rejected the authority of the Vedas and attacked the Hindu Caste System. He also rejected the path of renunciation (Tyaga or Yoga). He emphasized a householder's (family) life based on honest conduct, selfless service (Sewa), and constant devotion and remembrance of God's name. His words are registered in Guru Granth Sahib in the form of 974 poetic hymns. He died on 22 September 1539 at Kartarpur, India.



Guru Gobind Singh (22th December 1666 – 7th October 1708): The tenth and the last Guru Sikh faith Guru Gobind Singh was a Prophet and teacher of Sikh faith. The sacred shrine 'Takht Sri Harimandar Sahib', (place where he was born) is situated at Patna. Five elements of faith that Khalsa Sikhs wear at all times (Five Ks), was initiated by him in 1699. He fought 11 battles. The most famous among them was Battle of Bhangani. He died on 7th October 1708 at Nanded, India and passed Guruship to Eleventh and Eternal Sikh Guru, the Guru Granth Sahib Ji.

Guru Dutt (9th July 1925 – 10th October 1964): Guru Dutt was a Hindi motion-picture producer, director, writer, and actor. A postage stamp, bearing his face, was released by India Post to honour him on 11 October 2004. He made classics such as Pyaasa, Kaagaz Ke Phool , Sahib Bibi Aur Ghulam and Chaudhvin Ka Chand. Pyaasa and Kaagaz Ke Phool are now included among the greatest films of all time, both by Time magazine's "All-TIME" 100 best movies and by the Sight & Sound critics' and directors' poll.

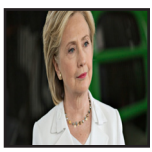


Gopal Krishna Gokhale (9th May 1866 – 19th February 1915): Gopal Krishna Gokhale was one of the social and political leaders during the Indian Independence Movement against the British Empire in India. Gokhale was famously a mentor to Mahatma Gandhi in his formative years. He is the founder of the Servants of India Society (1905).

Gunter Grass (16th October 1927 – 13th April 2015): Gunter Grass was a German novelist, poet, playwright, illustrator, graphic artist, sculptor, and recipient of the 1999 Nobel Prize in Literature. His extraordinary first novel Die Blechtrommel (1959; The Tin Drum), became the literary spokesman for the German generation that grew up in the Nazi era and survived the war.

George W Bush (6th July, 1946-): George Walker Bush served as the 43rd President of the United States from 2001 to 2009. He acted as the 46th Governor of Texas from 1995 to 2000. Bush led the United States' response to the 9/11 terrorist attacks and initiated the Iraq War. He is currently a public speaker, has written a memoir titled Decision Points.

Hillary Clinton (26th October, 1947): Hillary Clinton is an American Government Official, U.S. First Lady, Women's Rights Activist. She served as the 67th United States Secretary of State under President Barack Obama from 2009 to 2013. She is the wife of the 42nd President of the United States Bill Clinton.



Hellen Keller (27th June, 1880 – 1st June, 1968): Helen Keller was an American author, political activist, and lecturer. She was the first deaf blind person to earn a Bachelor of Arts degree. Her birthday is celebrated as Helen Keller Day in the U.S. state of Pennsylvania.



Ho Chi Minh (19 May 1890 – 2 September 1969): Ho Chi Minh was a Vietnamese Communist revolutionary leader. He became the Prime Minister (1945–55) and President (1945–69) of the Democratic Republic of Vietnam. He started Vietnamese independent movement from 1941 an established Communist-ruled Democratic Republic of Vietnam in 1945. He achieved a major success by defeating the French Union in the battle of Dien Biên Phu (1954). Though he officially resigned from

his post in 1965 due to health problems but remained involved in motivational work and inspiration for those Vietnamese fighting for his cause of a united, communist Vietnam until his death. He died on 2nd September 1969, of heart failure at his home in Hanoi, aged 79.

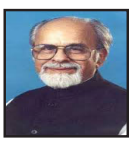
Isaac Newton (25 December 1642 – 20 March 1727): English physicist and mathematician Sir Isaac Newton, most famous for his law of gravitation, was instrumental in the scientific revolution of the 17th century. His book Philosophiæ Naturalis Principia Mathematica ('Mathematical Principles of Natural Philosophy'), first published in 1687, laid the foundations for classical mechanics.

Indira Gandhi (19th November 1917 – 31st October 1984): Indira Gandhi was the first female Prime Minister of India and also one of the main figures of the Indian National Congress. She was India's third Prime minister and served from 1966 to 1984, when she was assassinated by her bodyguards. She was also the recipient of the Bharat Ratna.



Ian Thorpe (13th October 1982-): Ian Thorpe is a freestyle Australian swimmer. He also competes in backstroke and as an individual medley. He is the first to win five Olympic gold medals in Australia. He also considered as the most successful athlete at the 2000 Summer Olympics with three gold and two silver medals. 2001 World Aquatics Championships was his major success as an athletic where he became the first person to win six gold medals. Till now he has eleven World Championship gold medals which the third-highest among the swimmers. He is the first person to be named as Swimming World Swimmer of the Year four times and had been the Australian Swimmer of the Year from 1999 to 2003. His achievements as a swimmer made him one of Australia's most popular athletes. He was recognised as the Young Australian of the Year in 2000.

Inder Kumer Gujral (4 December, 1919- 30 November, 2012): Inder Kumer Gujral was the prime minister of India from April 21, 1997, to March 19, 1998. He was the third Prime Minister who was elected from the Rajya Sabha. He is primarily remembered for the Gujral Doctrine, a policy grounded on India's unilaterally reaching out diplomatically to its neighbours without the expectation of reciprocity. He acted as an Ambassador of India to U.S.S.R. (Cabinet Rank) from 1976-1980 and held various ministerial positions from 1967-1976. During the government of Prime Minister V.P. Singh, he happened to be the Minister of External Affairs and again in 1996 when Janata Dal-led United Front government came to power. He died out of lung infection, on 30th November, 2012 at Gurgaon, Haryana.



Ibn Battuta (1304-1369): Ibn Battuta, was a geographer, explorer and traveller. In history, he is known for his extensive journeys. He travelled different parts of Islamic

world covering North Africa, West Africa, Southern Europe and Eastern Europe in the West, to the Middle East, Indian subcontinent, Central Asia, Southeast Asia and China in the East. It took him a period of almost thirty years. After his travel he returned to Morocco and gave account of his experiences to Ibn Juzay. This account has been recorded in 'A Gift to Those Who Contemplate the Wonders of Cities' and 'the Marvels of Travelling' or simply called as 'Rihla'. He was appointed a judge in Morocco and died in 1368.

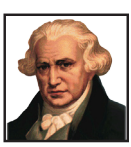
Ishwar Chandra Vidyasagar (26 September 1820 – 29 July 1891): Ishwar Chandra Vidyasagar was a philosopher, academic educator, writer, reformer and philanthropist. He is known for his efforts to simplify and modernize the Bengali Literature. He simplified and reconstructed the Bengali alphabet. He even reformed Bengali typography into an alphabet (actually abugida) of twelve vowels and forty consonants. He was very Liberal in his outlook though born in an orthodox Brahman family. Vidyasagar championed the uplift of the status of women in India. His 'Barna Porichoy' is still considered a classic work. His popular books were Betaal Panchabinsati (1847), Upakramanika (1851) and Sitar Bonobas, 1860. He died on 29 July 1891 in North Calcutta, Bengal.



Indra Nooyi (28th October 1955-): Indra Nooyi Indra Krishnamurthy Nooyi is a business executive, currently acting as a chairperson and chief executive officer of PepsiCo. She joined PepsiCo in 1994 and became its president and CFO in 2001. Nooyi purchased Tropicana in 1998, Quaker Oats Company and brought them under PepsiCo. Padma Bhushan was awarded to her in 2007. She has consistently been ranked among the World's 100 Most Powerful Women and in 2014, she was ranked 13. She is first woman to lead the soft-drink and snack-food company.

Indu Jain (8th September 1936-): Indu Jain, the 79-year-old industrialist handles the philanthropic genre of the Times foundation. She is chairperson of The Times Group and known for her Oneness Forum. She is an active supporter of women's rights. Times Foundation runs community services, research groups and relief funds for various disaster reliefs such as floods, cyclones, earthquakes and epidemics. She encourages budding entrepreneurs and believes in their abilities to shine. She is also founder President of the Ladies wing of FICCI. The Oneness Forum was given the Mahatma-Mahavira Award. International Lifetime Achievement Award was awarded to her by Indian Congress of Women.

James Watt (19th January 1736-25th August 1819): James Watt was a Scottish instrument maker and inventor whose steam engine contributed substantially to the Industrial Revolution in his native Great Britain and the rest of the world. He developed the concept of horsepower, and the SI unit of power, the watt, was named after him.



John F. Kennedy (29th May, 1917 – 22nd November, 1963): John F. Kennedy was the 35th President of the United States. He served from 1961 until his assassination in 1963. Major events during his presidency include the Bay of Pigs Invasion, the Cuban Missile Crisis, the building of the Berlin Wall, the Space Race, the American Civil Rights Movement and early events of the Vietnam War.

Javed Aktar (17th January 1945-): Javed Aktar is an Indian scriptwriter, lyricist, poet and an accomplished mainstream writer. He is a recipient of the Padma Shri (1999), Padma Bhushan (2007), the Sahitya Akademi Award as well as thirteen Filmfare Awards. He along with Salim Khan wrote classical 'Sholay' which was released in 1975 and proved to be an all time hit.



Jawahar Lal Nehru (14th November, 1889- 27th May, 1964): Pandit Jawahar Lal Nehru became first Prime Minister of independent India; a central figure in Indian politics for much of the 20th century and one of the main architects of Non-aligned Movement. He was very fond of children and they affectionately called him Chacha Nehru. In India, his birthday is celebrated as Children's Day.

Jackie Chan (7th April 1954-): Jackie Chan is an actor, martial artist, film director, producer. Chan is a UNICEF Goodwill Ambassador, and has championed charitable works and causes. He has received stars on the Hong Kong Avenue of Stars and the Hollywood Walk of Fame.

Jan Koum (24th February, 1976-) : Jan Koum is an internet entrepreneur and computer engineer of America. Apart from being CEO and co-founder with Brian Acton of WhatsApp, he entered the Forbes list of the 400 richest Americans in 2014 positing 62nd rank. He was hired by Yahoo as an infrastructure engineer way back in 1998. He met Acton while working at Ernst & Young as a security tester. In September 2007 Koum and Acton left Yahoo. Both applied, and failed, to work at Facebook. Then Feb. 24, 2009, he incorporated WhatsApp Inc. in California.

Jagdish Chandra Mahindra (1892-1951): J. C. Mahindra was an Indian industrialist who co-founded Mahindra & Mahindra. In 1929, he started with Tata Steel as his first job. There he worked as a senior Sales Manager. World War II was the critical time of steel industry it was then when he was appointed as the first Steel Controller of India. Later in 1945 he founded Mahindra along with K. C. Mahindra and Malik Ghulam Mohammed. After independence when Ghulam Mohammad left India and the company to be first Finance Minister of Pakistan, Mahindra brother decided to manufacture the Willey Jeep form Mumbai. Soon, the company's name changed to Mahindra & Mahindra. He died of a heart attack in 1951.



Jack Dorsey (19th November, 1976-): Jack Dorsey is an American CEO and co-founder of Twitter. He also serves as the founder and CEO of Square, a mobile payments company. In 2008, MIT Technology Review TR35 named him as one of the top 35 innovators in the world under the age of 35. He got 'Innovator of the Year Award' in 2012, for technology. He has been acting as a board member for Walt Disney Company since 2013.

Jamshedji Tata (3rd March 1939-19th May 1904): Founder of Tata Group, 'Jamshedji Tata' was the pioneer of industrialization in India. He worked in his father's company till 29 years of age, then initiated his first business by founding a trading company in 1868. Next year he bought an oil mill and converted it to a cotton mill and named it as Alexandra Mill. He sold that mill two years later for profit. Then again in 1874 he established another cotton mill at Nagpur in 1874 and named it as Empress of India. He had four goals in life: setting up an iron and steel company, a world-class learning institution, a unique hotel and a hydro-electric plant. He laid down the foundation of Tata Group, Tata Sons, Taj Hotels Resorts and Palaces, Indian Institute of Science. He died on19th May, 1904 at Bad Nauheim in Germany.



Jayadeva (1200-): Jayadeva was an Indian Sanskrit poet famous for his epic poem Gita Govinda which is a depiction of the divine love of Krishna, and Radha. The poem presents the dramatic form of lovers' attraction, estrangement, yearning, and final reconciliation. Two hymns, composed by Jayadeva, have been incorporated in the Guru Granth Sahib, the holy book of the Sikh religion. He is known for popularizing Dasavatara, the ten incarnations of Vishnu. He also institutionalized the Devadasi system in Oriya temples. He died in Odisha, India.

Jean Jacques Rousseau (28th June 1712 – 2nd July 1778): Jean Jacques Rousseau was a philosopher, writer, and composer. His novels inspired the leaders of the French Revolution and the Romantic generation. It led a way to development of modern political and educational thought. His famous works Emile, Julie, or the New Heloise, Solitary Walker and Confessions moulded the opinion of masses. His works were mostly related with the notable ideas of general will, moral simplicity of humanity, child-centred learning, civil religion, popular sovereignty, and positive liberty. He died in 1778 at Ermenonville in France.

Jimmy Wales (7th August 1966-): Jimmy Wales is a co-founder and promoter of the online non-profit encyclopaedia Wikipedia and the for-profit Wikia web hosting company. His first job was related in finance. Later he chose to work as the research director of Chicago futures and options firm. In 1996, he with two other partners founded Bomis (a male-oriented web portal featuring entertainment and adult content). It brought him initial funding for the peer-reviewed free encyclopaedia Nupedia (2000–03) and its successor, Wikipedia. Wikipedia was available

in a number of languages and became one of the Internet's most popular sites by 2006. In 2008 Wales served as a co-chair of the World Economic Forum on the Middle East. Same year he received Global Brand Icon of the Year Award. In February 2014, Wales was named as one of '25 Web Superstars' by 'The Daily Telegraph'.

J.K. Rolling (31st July 1965-): J.K. Rolling is famous for her novel Harry Potter series. Earlier she worked as a researcher and bilingual secretary for Amnesty International. One day on a delayed train from Manchester to London in 1990 she conceived the idea of Harry Potter series. She completed the first book of this world famous series in 1997 with the title Harry Potter and the Philosopher's Stone. Then in 2007 she produced the final six sequels, the last, Harry Potter and the Deathly Hallows. Since then, she has written four books for adult readers, The Casual Vacancy (2012); the crime fiction novels The Cuckoo's Calling (2013), The Silkworm (2014) and Career of Evil (2015). In 1999 she was honoured with National Book Awards Children's Book of the Year.



John F Nash (13th June, 1928- 23rd May 2015): John F Nash was a mathematician who was awarded the 1994 Nobel Prize for his contribution in Economics. His contribution to game theory made him Nobel Prize winner and got the Abel Prize for his contributions to the study of partial differential equations. His work in mathematics includes the Nash embedding theorem, theory of nonlinear parabolic partial differential equations and to singularity theory. His theories are used in economics, computing, evolutionary biology, accounting, computer science, games of skill, politics and military. On May 23, 2015 Nash and his wife were killed in a road accident on their way home after receiving the Abel Prize.

John Napier (1st February 1550- 4th April 1617): John Napier was a mathematician, physicist, and astronomer. He is best known as the inventor of logarithms. He invented 'Napier's bones' and made common the use of the decimal point in arithmetic and mathematics. He also made important contributions to spherical trigonometry. A Plaine Discovery of the Whole Revelation of St. John (1593) is regarded to be his most important contribution. He died at Edinburgh in Scotland on 4th April 1617. The crater Neper on the Moon is named after him.

Jonathan Swift (30th November, 1667- 19th October, 1745): Jonathan Swift was an Anglo-Irish satirist, essayist, poet and cleric who became Dean of St Patrick's Cathedral located at Dublin. He wrote some of the most memorable novels such as Gulliver's Travels, A Modest Proposal, A Journal to Stella, Drapier's Letters, and The Battle of the Books etc. He is regarded as the foremost prose satirist in the English language by the Encyclopædia Britannica. He originally published all of his works under pen name such as Lemuel Gulliver, Isaac Bickerstaff, Drapier's



Letters as MB Drapier – or anonymously. He is also known for being a master of two styles of satire (the Horatian and Juvenalian). He died on 19th October, 1745 in Dublin, Republic of Ireland.

Jyoti Basu (8th July 1914- 17th January 2010): Jyoti Basu was an Indian politician belonging to the Communist Party of India (Marxist) from West Bengal. He was the longest-serving Chief Minister in country's history. He served as a Chief Minister of West Bengal from 1977 to 2000. He started his political career as a student by organizing Indian students studying in United Kingdom for the cause of Indian independence. Basu was elected to the Bengal Legislative Assembly in 1946, contesting the Railway constituency. In 1977, Jyoti Basu became the Chief Minister and held this position continuously for more than 23 years. He died on 17 January 2010 at Kolkata due to pneumonia.



Julian Assange (3rd July 1971-): Julian Assange is an Australian computer programmer, publisher and journalist. He is known as the editor-in-chief of the website WikiLeaks. In 2006, he co-founded this company. WikiLeak produces what is called scientific journalism i.e. providing primary source materials with a minimum of editorial commentary. It came into limelight in 2010 when it published U.S. military and diplomatic documents leaked by Chelsea Manning. He has been under investigation in the United States since then. In the same year, the Swedish Director of Public Prosecution opened the case against him related to four sexual offences that Assange allegedly committed. In 2012, facing extradition to Sweden, he sought refuge at the Embassy of Ecuador in London and was granted political asylum by Ecuador.

Julius Caesar (13 July 100 BC- 15 March 44 BC): Julius Caesar was a Roman statesman, general and notable author of Latin prose. He is well known for overthrowing Roman Republic and the rise of the Roman Empire. He was the first Roman general to build a bridge across the Rhine and cross it for conducting the first invasion to Britain. He is considered as one of the greatest military commanders in history by many historians. Julius Caesar was posthumously granted the title Divus Iulius or Divus Julius by decree of the Roman Senate on 1 January 42 BC.

Karl Marx (5th May, 1818 – 14th March 1883): The German philosopher, social scientist, historian and revolutionary, Karl Marx, was undoubtedly most influential socialist thinker to emerge in the 19th century. In 1848, he published The Communist Manifesto with Friedrich Engels and was exiled to London, where he wrote the first volume of Das Kapital (1867-1894) and lived the rest of his life.

Khushwant Singh (2nd February 1915 – 20th March 2014): Khushwant Singh was an Indian novelist, journalist and lawyer. Some of his acclaimed works include 'Train

to Pakistan' (1956), 'Delhi: A Novel' (1990), 'The Company of Women' (1999), 'Truth, Love and a Little Malice' (2002), and 'The Good, the Bad and the Ridiculous' (2013). He was awarded the Padma Bhushan (1974), Punjab Rattan Award (2006) and Padma Vibhushan (2007).

Kalpana Chawla (March 17, 1962- February 1 2003): Kalpana Chawla was the first Indian-born woman astronaut in space. She first flew on Space Shuttle Columbia in 1997 as a mission specialist and primary robotic arm operator. Later in 2003, Chawla was one of the seven crew members killed in the Space Shuttle Columbia disaster.



Kabir (1398 or 1440 CE-1448 or 1518 CE): Kabir was a saint and a poet. His writings influenced the Bhakti movement in Hinduism. He is revered by Hindus, Muslims, and Sikhs alike.

Kiran Bedi (9th June 1949-): Kiran Bedi is an Indian politician, social activist, former tennis player and a retired police officer. She was the first Indian woman to join the Indian Police Services. She was BJP's CM candidate for the 2015 Delhi Assembly elections against Arvind Kejriwal. She lost the election from Krishna Nagar constituency.

Kailash Satyarthi (1 January 1954-): Kailash Satyarthi works for children's rights and education in India. He also advocates against child labour. He is commonly known for founding the Bachpan Bachao Andolan in 1980. He has acted to protect the rights of more than 83,000 children from 144 countries. He gave up his career as a teacher to become secretary general for the Bonded Labour Liberation Front in 1980. He started 'save the childhood' movement. He has received various national and international honours and awards including the Nobel Peace Prize of 2014, which he shared with Malala Yousafzai of Pakistan. In 1999 Satyarthi was among the co-founders of the Global Campaign for Education. He came up with a book 'Globalisation, Development and Child Rights in loss' in 2006.

Kanishka (127–163 AD): Kanishka was the emperor of the Kushan dynasty, who was famous for his military, political, and spiritual achievements. His devotion and conquest for Buddhism led to the development of the Silk Road. Images of the Buddha based on 32 physical signs were made during his time. He encouraged both Gandhara school of Greco-Buddhist Art and the Mathura school of Hindu art. The coin of his regime depicted image standing Buddha.

Kiran Mazundar Shaw (23rd March 1953-): Kiran Mazundar shaw is the chairman and managing director of biotechnology company Biocon India Group. She is also the current chairperson of IIM-Bangalore. In 2014, she was awarded the Othmer Gold Medal for her outstanding contributions in the field of science, especially chemistry. The Financial Times ranked her among top 50 women in business list. In 2014, she is listed as the 92nd most powerful woman in the world by Forbes. She initiated her career with a consulting work.



Then in 1978 she became the partner of Auchincloss (owner of Biocon Biochemicals) in a new venture, Biocon India. It produced enzymes for alcoholic beverages, paper, and other products. Within a year it became the first Indian company to export enzymes to the United States and Europe.

Kofi Annan (April 8, 1938-): Kofi Annan served the United Nations (UN) as secretary-general from 1997 to 2006. He began his career in 1962 as a budget officer of World Health Organization. Since then he has spent whole of his professional career working with UN at different administrative levels. He was appointed as a secretary-general of UN twice; for the first time in 1997 and then in 2001. He introduced a reform plan that sought to reduce the organization's budget and streamline its operations. His other priorities as a secretary-general of UN included restoring public confidence in the UN, combating the AIDS virus, especially in Africa, and ending human rights abuses. He along with the United Nations was the co-recipients of the 2001 Nobel Peace Prize 'for their work for a better organized and more peaceful world. He is the founder and the Chairman of the Kofi Annan Foundation and chairman of The Elders, a group founded by Nelson Mandela.

Kumar Birla (14th June 1967-): Kumar Birla is the Chairman of the multinational Aditya Birla Group which operates in 36 countries across the globe. It is India's third largest business group. He also serves as the Chancellor of the Birla Institute of Technology & Science. He took over Aditya Birla Group in 1995, after the sudden death of his father. Under his leadership the Aditya Birla Group has expanded into new sectors including telecom, software and BPO including textile and garments, cement, aluminium, fertilizer etc which existed during his father time. Apart from handling Aditya Birla Group, he worked as a Director on the Central Board of Directors of the Reserve Bank of India. He was the Chairman of the Advisory Committee constituted by the Ministry of Company Affairs and also served on The Prime Minister of India's Advisory Council on Trade and Industry. At present he serves National Council of the Confederation of Indian Industry and the Apex Advisory Council of the Associated Chambers of Commerce and Industry of India.

Kapil Dev (6th January 1959-): Kapil Dev is a former Indian cricketer best known for leading his team to a World Cup victory in 1983. He is regarded as one of the greatest all-rounders of all time.



He has received the Arjuna Award, Padma Bhushan, Padma Shri and many more awards for his contribution to the game of cricket. He was inducted to ICC Hall of Fame in 2010.

Leonardo da Vinci (April 15, 1452 – May 2, 1519): Leonardo da Vinci was an Italian polymath, being a scientist, mathematician, engineer, inventor, anatomist, painter, sculptor, architect, botanist, musician and writer known for his enduring works 'The Last Supper' and 'Mona Lisa'.

Louis Pasteur (27th December, 1822- 28th September 1895): French Chemist and Microbiologist Louis Pasteur who came up with the food preparing process known as pasteurization also developed vaccination for anthrax and rabies. He is popularly known as the 'father of microbiology'. His scientific accomplishments earned him France's highest decoration, the Legion of Honour, as well as election to the Académie des Sciences.

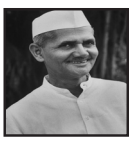
Louis Braille (4th January 1809 – 6th January 1852): Braille was a French educator and Inventor. He devised the Braille system of printing and writing for the blind. He was blinded accidentally in his early childhood.

Lata Mangeshkar (28th September 1929-): Lata Mangeshkar is one of the most renowned female playback singers in Bollywood. She has also been nicknamed as Nightingale of Bollywood. She has been awarded with numerous awards, including Bharat Ratna, Padma Bhushan (1969), Padma Vibhushan (1999), Dada Saheb Phalke Award (1989), Maharashtra Bhushan Award (1997), NTR National Award (1999), Bharat Ratna (2001), ANR National Award (2009), three National Film Awards, and 12 Bengal Film Journalists' Association Awards.

Lakshmi Mittal (15th June 1950-): Lakshmi Mittal also known as the 'Iron Man of Calcutta' is the Indian steel mogul. He is the Chairman and Chief Executive Officer of Arcelor Mittal, the biggest steel producing company of the world.

Lal Krishna Advani (8th November 1927-): Lal Krishna Advani is an Indian politician and one of the most senior leaders of the Bharatiya Janata Party (BJP). He served as Deputy PM of India from 2002 to 2004 under Atal Bihari Vajpayee. He was awarded the Padma Vibhushan in 2015.

Lal Bahadur Shastri (2nd October, 1904- 11th January 1966): Lal Bahadur Shastri was the Prime Minister of India (1964–66) after Jawaharlal Nehru. He was the leader of the Indian National Congress and was elected to the legislature of the United Provinces in 1937 and 1946. During first five year plan he served as a Railways Minister (1951–56) followed by various functions, including Home Minister (1961-63) and External Affair Minister (1964-66). He led the country during the Indo-Pakistan War of 1965 with the slogan of 'Jai Jawan Jai Kisan'. The war formally ended with the Tashkent Agreement of 10th January 1966. He died there in Tashkent of a heart attack the following day.



Larry Page (March 26, 1973-): Larry Page is the cofounder of Google Inc. He is the computer scientist, internet entrepreneur along with being CEO of Alphabet (parent company of Google). In 1998, PC Magazine ranked Google among the Top 100 Websites and Search Engines. The following year it awarded Google the Technical Excellence Award for Innovation in Web Application Development. Then, in 2001 Page gave up his post as CEO of Goggle and

became president of the company. He announced his rejoining as a CEO of Alphabet. He is the board member of the X Prize Foundation (XPRIZE). The National Academy of Engineering in 2004 elected him as the winner of the Marconi Prize. In October 2015, Forbes' named him as number one 'America's Most Popular Chief Executives'.

Lenin (22nd April 1870- 21st January 1924): Lenin, a Russian communist revolutionary, served as head of government of the Russian Soviet Federative Socialist Republic from 1917 to 1924 and of the Soviet Union from 1922 to 1924. He was ideologically a Marxist and his political theories are known as Leninism. He promoted socialization of all property as public property during his administration. He overthrew Provisional Government and brought in Bolshevik administration. He also abolished the Russian Constituent Assembly and suppressed both left and right-wing rivals and established a one-party state under the new Russian Communist Party. In 1921, New Economic Policy, a mixed economic system was introduced by him. He is considered as one of the most significant and influential historical figures of the 20th century. He died on 21st January, 1924 at Gorki in Russian.



Leo Tolstoy (9th September 1828 – 20th November 1910): Leo Tolstoy was a Russian author and the master of realistic fiction. He is regarded as one of the world's greatest novelists. His first published work, Detstvo (1852; Childhood), was a fictionalized and nostalgic account of his early years. Tolstoy is best known for his two longest works, War and Peace (1865–69) and Anna Karenina (1875–77). In shorter works, The Death of Ivan Ilyich (1886) is considered to be his best novel. Boyhood, and Youth and Sevastopol Sketches (1855) were based upon his experiences in the Crimean War. He even wrote plays and numerous philosophical essays. Tolstoy's final years have been presented in the movie 'The Last Station' based on the novel by Jay Parini.

Lord Mountbatten (25th June 1900- 27th August 1979): Lord Mountbatten was the last Viceroy of India and the first Governor-General of the independent Dominion of India (1947–48). He joined navy in 1913 and subsequently, in 1932 was promoted to captain. He served as the Supreme Allied Commander South East Asia Command during Second World War, (1943–46). Serving as a viceroy of India he very efficiently administered the transfer of power from Britain to the newly independent nations of India and Pakistan. As the governor-general of India, he helped in persuading Indian princes to merge their states into either India or Pakistan. He became the admiral in 1956 and governor in 1965. In 1979, Mountbatten along with his grandson Nicholas, and two others were killed by the Provisional Irish Republican Army (IRA).

Larry King (19th November 1933): Larry King is an American television and radio host, actor,

and comedian. From 1985 to 2010, he hosted the nightly interview television program Larry King Live on CNN.

Mahatma Gandhi (2nd October 1869- 30th January 1948): Mohandas Karamchand Gandhi, most commonly known as 'Mahatma' was the preeminent leader of Indian nationalism in British-ruled India. Employing nonviolent civil disobedience, Gandhi led India to independence and inspired movements for civil rights and freedom across the world. Indians widely describe Gandhi as the father of the nation.



Martin Luther King Jr. (15th January, 1929 – 4th April, 1968): Martin Luther King Jr. was a Baptist minister and social activist, who led the Civil Rights Movement in the United States from the mid-1950s until his death by assassination in 1968. King was posthumously awarded the Presidential Medal of Freedom and the Congressional Gold Medal.

Mark Twain (30th November, 1835- 21st 1910): Mark Twain was a pseudonym of Samuel Langhorne Clemensas, an American humorist, journalist, lecturer, and novelist who acquired international fame for his travel narratives, especially The Innocents Abroad (1869), Roughing It (1872), and Life on the Mississippi (1883), and for his adventure stories of boyhood, especially The Adventures of Tom Sawyer (1876) and Adventures of Huckleberry Finn (1885).

Munshi Premchand (31th July 1880 – 8th October 1936): Munshi Premchand was a novelist, short story writer, and dramatist. His famous works include Godaan, Bazaar-e-Husn, Karmabhoomi and Shatranj ke khiladi. He is one of the most celebrated writers of the Indian subcontinent.

M.S. Dhoni (7th July 1981-): Mahendra Singh Dhoni is an Indian cricketer and the captain of the Indian cricket team in limited-overs format. The middle order wicketkeeper and batsman is known for his attacking batting style. He was awarded the ICC ODI Player of the Year award in 2008 and 2009 (the first player to win the award twice), the Rajiv Gandhi Khel Ratna award in 2007 and the Padma Shri in 2009.

Mother Teresa (26th August 1910 – 5th September 1997): Mother Teresa was a Roman Catholic religious sister and missionary and the founder of the Order of the Missionaries of Charity, a Roman Catholic congregation of women dedicated to the poor, particularly to the destitute of India. She received numerous honours, including the 1979 Nobel Prize for Peace.



Mirza Ghalib (27th December 1797 –15th February 1869): Mirza Asadullah Khan Beg was an eminent Urdu and Persian language poet. He wrote under the pen names of Ghalib and Asad. He was one of the most popular and influential poets of the Urdu language.

Michael Jackson (29th August, 1958 – 25th June, 2009): Michael Jackson was a singer, songwriter, dancer and an actor. He is often referred as the king of Pop. Some of his awards include Guinness World Records, 13 Grammy Awards, the Grammy Legend Award, the Grammy Lifetime Achievement Award and 26 American Music Awards.



Mukesh Ambani (19th April 1957): Mukesh Dhirubhai Ambani is an Indian business magnate. He is the chairman, managing director and largest shareholder of Reliance Industries Limited (RIL). He also owns the Indian Premier League franchise Mumbai Indians.

Mulk Raj Anand (12th December 1905 – 28th September 2004): Mulk Raj Anand was a prominent Indian author who wrote numerous novels, short stories, and critical essays in English. He is known for his realistic and sympathetic portrayal of the poor in India.

Marie Curie (7th November 1867 – 4th July 1934): Marie Curie was a Polish-born French physicist, famous for her work on radioactivity. She was the first woman to win a Nobel Prize, the first person and only woman to win twice, the only person to win twice in multiple sciences. Her achievements include a theory of radioactivity (a term that she coined), techniques for isolating radioactive isotopes, and the discovery of two elements, polonium and radium.

Manna Dey (1st May 1919 – 24th October 2013): Manna Dey was an Indian playback singer. He debuted in the film Tamanna in 1942, and went on to record more than 4000 songs from 1942 to 2013. The Government honoured him with the Padma Shri in 1971, the Padma Bhushan in 2005 and the Dadasaheb Phalke Award in 2007.

Mick Jagger (26th July 1943-): Sir Michael Philip 'Mick' Jagger is an English singer, songwriter and actor. He is best known as the lead vocalist and the co-founder of The Rolling Stones. He was knighted for his services to the music industry in 2003.

Mohammed Rafi (24th December 1924 – 31th July 1980): Mohammed Rafi was one of the most acclaimed playback singers of the Hindi film industry. He has won six Filmfare Awards and a National Film Award. He has also been honoured with the Padma Shri in 1967.



Marco Polo (15th September, 1254 – January 8 1324): He was an Italian merchant traveller. His book 'The Travels of Marco Polo', 1300 A.D. introduces Europeans to Central Asia and China. He was the first to leave a detailed chronicle experience of his China visit. He died in 1324 and was buried in the church of San Lorenzo in Venice.

Muhammad Yunus (28 June 1940-): Muhammad Yunus is a Bangladeshi social entrepreneur, banker and economist. Yunus and the Grameen Bank were jointly awarded the Nobel Peace Prize

in 2006 for creating economic and social development from below. They provided loans to too poor entrepreneurs to qualify for traditional bank to establish a business. He was honoured with United States Presidential Medal of Freedom in 2009 and the Congressional Gold Medal in 2010. Yunus along with three others in 2011 co-founded Yunus Social Business – Global Initiatives (YSB). YSB creates and empowers social businesses to address and solve social problems around the world. He was a professor of economics at Chittagong University in Bangladesh and he joined Glasgow Caledonian University in Scotland as a Chancellor in 2012.

Maria Sharapova (19th April 1987-): Maria Yuryevna Sharapova a Russian professional tennis player, who is ranked world No. 4 by the Women's Tennis Association (WTA) is United States resident since 1994. She has been ranked world No. 1 in singles by the WTA on five separate occasions, for a total of 21 weeks. She is the tenth women and the only Russian to hold Grand Slam.



Madame Tussaud (1st December, 1761- 16th April, 1850): Madame Tussaud was a French and the founder of Madame Tussaud's museum of wax figures, in central London. She learned this art of making wax figures from Philippe Curtius at an early age. Her first wax sculpture was of Voltaire, in 1777. During the French Revolution she modelled many prominent victims. In 1802 she exhibited her work alongside Paul Philidor show at the Lyceum Theatre in London. She travelled and exhibited her collection throughout Britain and Ireland. Finally, in 1835 she established a permanent home in Baker Street, London, where she worked until eight years before her death. She died on 16th April, 1850 in London, England.

Mark Zuckerberg (14th May, 1984-): Mark Elliot Zuckerberg, an American computer programmer and Internet entrepreneur is best known as one of five co-founders, chairmen and chief executives of the social networking website Facebook. He launched Facebook from Harvard University's dormitory rooms. At the age of 23, in 2007, Facebook's success made him a billionaire. He was ranked 7th richest American as his personal wealth was estimated to be $44.6 billion by Forbes in October 2015. As CEO of Facebook he receives a one-dollar salary a year.



Madan Mohan Malviya (25th December 1861- 12th November 1946): Madan Mohan Malviya was an Indian educationist and politician. He was respectfully addressed as Pandit Madan Mohan Malaviya and 'Mahamana'. He became the president of Indian National Congress four times. He founded Banaras Hindu University (BHU) at Varanasi in 1916 and served as its Vice Chancellor from 1919–1938. He left



Congress in 1934 and joined Hindu Mahasabha. He acted as the president of special session of Mahasabha in Gaya (1922) and in Kashi (1923). He founded 'The leader' an English newspaper published from Allahabad in 1909 and was the Chairman of Hindustan Times from 1924 to 1946. He was awarded Bharat Ratan in 2014. He died on 12th November 1946 at Varanasi, UP.

Madhubala (14th February 1933 – 23rd February 1969): Madhubala was one of the most influential personalities and beautiful actresses of Hindi movies. She worked in Bollywood between 1942 and 1960. Her performance in Mughal-e-Azam established her as an iconic actress of Hindi Cinema. She did her first movie Basant (1942) at the age of nine. Her first lead role debut was at the age of 14 in Neel Kamal opposite to Raj Kapoor in (1947). Mumtaz Jehan Dehlavi was her real name. After Neel Kamal she assumed her screen name 'Madhubala'. She died at the age of 36 years on 23 February 1969 after a prolonged illness (ventricular septal and pulmonary pressure of the lungs) in Mumbai.



Maharaja Ranjit Singh (13th November 1780 – 27th June 1839): Maharaja Ranjit Singh was the founder of Sikh empire in Punjab which existed between1799 to 1849. He was first Indian in a millennium to prevent the invasion of the Pashtuns (Afghans) and re-conquered the homelands. He fought a large number of battles most significant among them were fought in 1813, 1823, 1834 and 1837. For his efforts he has been known as the Lion of the Punjab. He was free from religious bigotry, and was mild in the treatment of his adversaries. He completely renovated the Golden Temple (Harmandir Sahib) at Amritsar. He died on 27th June 1839 at Lahore in Pakistan.

Malala Yousafzai (12th July 1997-): Malala Yousafzai is a Pakistani activist for female education. She is the youngest among the Nobel Prize winners. Malala is a campaigner of the right to education, especially female education. The movement started in Swat Valley (her native) a northwest region of Pakistan, where the local Taliban had at times banned girls from attending school, became an international movement. She was former blogger for BBC Urdu which she used to share the prevailing condition in Swat valley with world. Time magazine featured her as one of "The 100 Most Influential People in the World" in year 2013, 2014 and 2015.



Manoj Night Shyamalal (6th August 1970): Manoj Night Shyamalal is an Indian-American film director famous for his movies 'The Sixth Sense' (1999) and 'Unbreakable' (2000) and 'Signs' (2002). He worked as screenwriter, producer and occasional actor. His first film was a semi-autobiographical drama 'Praying with Anger' (1992) as a student. 'Wide Awake' came in1998 followed by The Sixth sense in 1999 in which his work was recognized worldwide.

He is known for making movies with contemporary supernatural plots along with psychological thriller and science fiction. He is known to filming his movies in and around Philadelphia, Pennsylvania, his home town. His films are mostly co-produced and released by the Walt Disney Studios' Touchstone and Hollywood film imprints. Shyamalan in 1998 was awarded the Padma Shri.

Martina Hingis (30th September 1980-): Martina Hingis is a Swiss professional tennis player, known for



winning five Grand Slam singles titles the Australian Open (1997, 1998, 1999), Wimbledon (1997), and the United States Open (1997). Throughout her career she has won 43 singles titles and 37 doubles titles. She has spent a total of 209 weeks as world No. 1. Hingis became youngest ever Grand Slam champion and youngest ever world No. 1 setting a youngest ever series. Then in 2002, at the age of 22 she got ligament injuries in both ankles which forced her to withdraw temporarily from professional tennis. She returned back in 2013, July to play the North American hard court season, partnering Daniela Hantuchová. Time in June 2011 named her among one of the "30 Legends of Women's Tennis: Past, Present and Future".

Marconi (25th April 1874 – 20th July 1937): Marconi was an Italian electrical engineer who invented long-distance radio transmission and a radio telegraph system. He even developed a law which came to be known as Marconi's law. He got Nobel Prize in Physics in 1909 which he shared with Karl Ferdinand Braun. He even founded The Wireless Telegraph & Signal Company (which became the Marconi Company) in Britain in 1897. Marconi made radio a commercial success. He was sent as plenipotentiary delegate to the peace conference in Paris (1919), where he signed the peace treaties with Austria and with Bulgaria. He was made marchese and nominated to the Italian senate (1929) and chosen president of the Royal Italian Academy (1930). He died on 20th July 1937 at Rome, Italy due to heart attack.

Marry Kom (1st March 1983-): Marry Kom is an Indian boxer from Manipur. Her win at the First State Level Invitation at the women's boxing championship 2000 in Manipur initiated her boxing career. She won five national Championships from 2000 to 2005. In 2008, at the Asian Women's Boxing Championship in India, she won a silver medal. In the same year at AIBA Women's World Boxing Championship in China she earned the Gold medal which was her fourth successive gold medal at the championship. In 2012 at Summer Olympics in London she won bronze medal. In 2014 Asian Games, she won a Gold Medal in Flyweight category. She had been given Arjuna Award (Boxing), 2003, Padma Shree (Sports), 2006 and Padma Bhushan (Sports), 2013 along with many other honours.



Marilyn Monroe (1st June, 1926 – 5th August 1962): Marilyn Monroe is an American actress. She became a major sex symbol in 1950s and began to be considered as popular culture icon. She stated her modelling career in the year 1944 after meeting a photographer. Her acting career started with two short-lived film contracts with Twentieth Century-Fox (1946–47) and Columbia Pictures (1948). After a series of minor film roles, she signed a new contract with Fox in 1951. She played a lead role in the noir Niagara, Gentlemen Prefer Blondes and How to Marry a Millionaire which established her as a star. After this she was imaged as a "dumb blonde". Monroe was found dead in the bedroom of her Brentwood home on 5th August, 1962 due to acute barbiturate poisoning.

Medha Patkar (1st December 1954-): Medha Patkar is a renowned Indian social activist and reformer who initiated Narmada Bachao Andolan. She is the founder of National Convener of National Alliance of People's Movements (NAPM). She left her Ph.D. to take part in the agitation by tribals and peasants of Maharashtra, Madhya Pradesh and Gujarat. She was a representative to the World Commission on Dams. Patkar was a recipient of Right Livelihood Award (1991), Human Rights Defender's Award and Mother Teresa Awards for Social Justice (2014) along with many other awards.



Megasthenes (350 – 290 BC): Megasthenes was a Greek ethnographer and explorer. His book work Indica became famous. He was the ambassador of Seleucus I of the Seleucid of the Mauryan emperor Chandragupta. He gave a detailed account of India of that time. He is regarded as one of the founders of the study of Indian history in the West.

Michael Faraday (22nd September 1791 – 25th August 1867): Michael Faraday was the most influential scientists in history. He began his career as a chemist. His main contribution is in field of electricity and magnetism. He discovered electromagnetic induction, diamagnetism and electrolysis. Inventions of electromagnetic rotary devices by him formed the foundation of electric motor technology. Faraday was the first and leading Fullerian Professor of Chemistry at the Royal Institution of Great Britain. It is a lifetime position. The SI unit of capacitance is named in his honour: the farad. He died in 1867 in London.

Michael Schumacher (3rd January 1969-): Michael Schumacher is a retired German racing driver. He is known to win the highest number of world championship and races than any other driver in a career which spanned 19 seasons. Michael Schumacher is a seven-time Formula One World Champion. He was named Laureus World Sportsman of the Year twice. Michael won two titles with Benetton in 1994 and 1995. Then he shifted to Ferrari and drove eleven years for them. He won five consecutive titles between 2000 and



2004. UNESCO named him as 'Champions for sport' in 2002 for his contributions to sport and raising awareness of child education. Schumacher played voice role as Ferrari F430 in the Disney/Pixar film Cars. The French film Asterix and Obelix at the Olympic Games features Schumacher in a cameo role.

Milkha Singh (1930-): Milkha Singh has been the greatest Indian Athlete the nation has ever had. He has been nicknamed as the Flying Sikh. Milkha Singh initiated practicing sport after he joined Army in 1954. Under the guidance of his mentor Havaldar Gurdev Singh, he received rigorous training. Milkha completed 2nd in the 200m and 400m race events at Services Athletic Meet 1955. At Melbourne Olympic Games 1956 he represented the nation. Milkha won Gold Medals in Tokyo Asian Games 1958 and 1962. At the Cardiff Commonwealth Games he won Gold Medal the same year. In Rome Olympic Games (1960) he finished second there. He was awarded the Padma Shri in 1956.



Michael Phelps (30th June 1985): Michael Phelps is the most decorated Olympian of all time who won 22 medals in three Olympiads. He began swimming at the age of seven. He held a national record for his age group at the age of 10. Michael qualified for the 2000 Summer Olympics at the age of 15 and become the youngest male to make a U.S. Olympic swim team in 68 years. He holds the all-time records for Olympic gold medals (18, double the second highest record holders), Olympic gold medals in individual events (11), and Olympic medals in individual events for a male (13).

Mihir Sen (16th November 1930 – 11th June 1997): Mihir Sen was a long distance swimmer and the first Indian to conquer the English Channel from Dover to Calais in 1958. He became the only man to swim across the Oceans of the five continents in the year (1966). Mihir was inspired by Florence Chadwick, the first American woman to swim the English Channel in 1950 and started learning swimming. He was awarded the Padma Shri in 1959. Sen initially practised Criminal Law at the Calcutta High Court as he was a law graduate but later became businessmen. The Government of India regarded his company as the country's second largest silk exporter and was thus awarded. He died suffering from Alzheimer's and Parkinson's disease on 11th June 1997.

Mira Nair (15th October 1957-): Mira Nair is an accomplished film director, writer and producer. Her film career began as an actor and then she turned to directing award-winning documentaries. Nair made her debut with Salaam Bombay which won the Camera D'Or (for best first feature) and the Prix du Publique (for most popular entry) at the Cannes Film Festival. Mississippi Masala (1988), Monsoon Wedding (2001), Vanity Fair (2004), The Namesake (2006) and 11'9"01 September 11were few of her best movies. She won Padma Bhushan in 2012.



Madurai Subbulakshmi (16th September 1916-11th December 2004): Madurai Subbulakshmi was a Carnatic vocalist and the first musician ever to be awarded the Bharat Ratna (1998). She is the first Indian musician to receive the Ramon Magsaysay award, often considered Asia's Nobel Prize, in 1974. At the age of ten she made her debut at Madurai Sethupati High School singing a Marathi song Anada Ja on the request of her mother. She did her first recording Maragatha Vadivum for Twin recording company in the same year. She was capable of giving solo performances even at the age of seventeen. She got Padma Bhushan in 1954.



Mike Tyson (June 30, 1966-): Mike Tyson is an American former professional boxer. He holds the record of the youngest boxer to win the WBC, WBA and IBF heavyweight titles at 20 years, 4 months, and 22 days old. Tyson successfully defended the world heavyweight championship nine times. In 1992, he was convicted of raping Desiree Washington and sentenced to six years but was released after serving three years. After that he tried to make his comeback and in 1996, he won the WBC and WBA titles. These wins put him in the category of the men in boxing history who regained a heavyweight championship after having lost it. Tyson retired from professional boxing in 2006. He got WWE Hall of Fame (Class of 2012).

Muhammad Iqbal (9th November 1877- 21th April 1938): Muhammad Iqbal was known as a poet, philosopher, and politician, as well as an academic, barrister and scholar. He is widely regarded as having inspired the Pakistan Movement. He is regarded as one of the most important figures in Urdu and Persian literature. His first poetry book, Asrar-e-Khudi came in 1915. Apart from his poetry, his Urdu and English lectures along with letters have significant effect on cultural, social, religious and political disputes. Iqbal is regarded as the Shair-e-Mashriq in South Asia and Urdu speaking world. The Pakistan government officially named him a "national poet". He was the one to author the song 'Saare Jahaan Se Achcha'. He died on 21st April 1938, at Lahore.

Naina Lal Kidwai (1957-): Naina Lal Kidwai is an Indian banker. She is currently the Group General Manager and Country Head of HSBC India. She is the first woman to guide the functioning of a foreign bank in India. Naina is also a qualified chartered accountant. Her first job was of an associate in Price Waterhouse (1977–1979) and then worked in ANZ Grindlays Bank (1982–1985) as an investment banker. She worked in Morgan Stanley (India) between1994-2002. Naina joined as vice chairman, managing director, and head of investment banking in 2002. She has also received ALL Ladies League's Delhi Women of the Decade Achievers Award 2013 for Excellence in Banking.



Narendra Modi (17th September 1950-): Narendra Modi is an Indian politician. He is the 15th and current Prime Minister of India since 26th May 2014. He served as the Chief Minister of Gujarat from 2001 to 2014. He is the Member of Parliament (MP) from Varanasi constituency. Modi is known for his unique initiatives like Swachh Bharat Mission and Make in India and Digital India. He was named as the Best Chief Minister in a 2007 survey by India Today. He was ranked fifth on Fortune magazine's second annual list of 'World's Greatest Leaders' in 2015.



Niccolo Machiavelli (3 May 1469- 21 June 1527): Niccolo Machiavelli was an Italian diplomat. He was a Renaissance historian and a politician who is known as the founder of modern political science. Machiavelli is most notably known for The Prince containing several maxims concerning politics. The Catholic Church banned The Prince. His other works include On the Art of War (1521) and satirical The Mandrake (1524's). He died in the city of Florence on 21st June, 1527.

Nelson Mandela (18th July, 1918 - December 5 2013): Nelson Rolihlahla Mandela was a South African anti-apartheid revolutionary, politician, activist, lawyer, and philanthropist who served as nationalist and the first black president of South Africa (1994–99). He was the symbol of global peacemaking; and won the Nobel Peace Prize in 1993.



Nitish Kumar (1st March 1951-): Nitish Kumar has been the Chief Minister of Bihar since 2005. He belongs to the Janata Dal (United) party. He became General Secretary of the Janata Dal at the national level. In 2001-04 he became Union Cabinet Minister for Railways in the NDA Government of Atal Bihari Vajpayee. In 2005, he defeated Lalu Prasad Yadav in the Bihar assembly elections. He has won three consecutive Bihar assembly elections and remained as the Chief Minister of Bihar since 2005.

Noam Chomsky (7th December, 1928): Noam Chomsky is an American linguist, political commentator and social justice activist. He is known for his groundbreaking contributions to linguistics and his penetrating critiques of political systems. In 1955, professorial staff at Massachusetts Institute of Technology invited him to join their rank. There he introduced transformational grammar to the linguistics field. Chomsky was awarded the Sydney Peace Prize, 2011. The same year he was inducted into IEEE Intelligent Systems' AI's Hall of Fame for the "significant contributions to the field of AI and intelligent systems".

Norgay Tenzing (May 1914- 9th May 1986): Norgay Tenzing was a Nepalese Sherpa mountaineer who is first to climb world's highest mountain (Mt. Everest). He started climbing at the age of 19 years. Norgay participated as a high-altitude porter in three British officials attempts to climb Everest from the northern Tibetan side in the 1930s. In 1947, Norgay he again participated in an unsuccessful

summit attempt of Everest. He got success in climbing Mt. Everest in 1953, with along with Edmund Hillary. TIME named him as one of the 100 most influential people of the 20th century. He died 7 May, 1986 at Darjeeling, West Bengal.

Netaji Subhash Chandra Bose (23 January 1897- August 18 1945): Subhash Chandra Bose was one of India's greatest freedom fighters. He revived the Indian National Army, popularly known as 'Azad Hind Fauj' in 1943 which was initially formed in 1942 by Rash Behari Bose.



Napoleon Bonaparte (15th August, 1769 – 5th May, 1821): Napoleon Bonaparte was a French military and political leader who rose to prominence during the later stages of the French Revolution and its associated wars in Europe. As Napoleon I, he was Emperor of the French from 1804 to 1814. Napoleon dominated European affairs for over a decade while leading France against a series of coalitions in the Revolutionary Wars and the Napoleonic Wars. He won most of these wars and rapidly gaining control of continental Europe before his ultimate defeat in 1815.

Neil Armstrong (5th August, 1930 – 25th August, 2012): Neil Armstrong was an astronaut and the first man to walk on the moon. He was the commander of Apollo 11 which was the first manned moon landing mission in July 1969. He was awarded the Presidential Medal of Freedom by President Richard Nixon.

N. R. Narayana Murthy (20th August 1946): Narayana Murthy is an industrialist and the co-founder of Infosys. He started Infosys in 1981 and served as its CEO from 1981 to 2002 and served as the chairman from 2002 to 2011. Murthy has been awarded the Padma Vibhushan and Padma Shri awards.



Nayantara Sahgal (10th May 1927-): Nayantara Sahgal is an Indian Journalist and author. Her writings are fictional based on India's elite responding to the crises engendered by political change. She belongs to the Nehru-Gandhi family and is the daughter of Jawaharlal Nehru's sister, Vijaya Lakshmi Pandit. Some of her notable works include Rich like us (1985), Plans for Departure (1985), Mistaken Identity (1988) Relationship, Extracts from a Correspondence (1994) and Point of View: A Personal Response to Life, Literature, and Politics (1997). She was awarded the 1986 Sahitya Akademi Award for English. Sahgal was recently in news on for returning her Sahitya Akademi Award to protest what she called, "increasing intolerance and supporting right to dissent in the country".

Naseeruddin Shah (20th July 1950-): Naseeruddin Shah is a renowned Indian film and stage actor. Shah has acted in movies such as Nishant, Aakrosh, Sparsh, Mirch Masala, Albert Pinto Ko Gussa Kyon Ata Hai, Junoon, Mandi etc. The Government



has honoured him with the Padma Shri and the Padma Bhushan. He has been awarded the life membership of International Film and Television Club of Asian Academy of Film & Television. He won National Film Award for Best Actor twice for his role in Sparsh and Paar. He also played the part in television series such as Mirza Galib (as Mirza Galib) and Bharat Ek Khoj (as Shivaji). He won Sangeet Natak Akademi Award in 2000. The same year he also got International Indian Film Academy Awards — Artistic Excellence for Performance in a Negative Role for Sarfarosh.

Om Prakash Jindal (7 August 1930 – 31 March 2005): Om Prakash Jindal is known for establishing business enterprise 'Jindal Steel and Power'. He was appointed as the Minister of Power in the Government of Haryana. He won Legislative Assembly seat of Haryana for three consecutive years. He also served as a Member of the Committee on Food, Civil Supplies and Public Distribution from 1996 to 1997. Om Prakash was elected to Vidhan Sabha of Haryana in February 2005. He was in service as the Minister of Power in the Government of Haryana at the time of his death in 2005. He received Life Time Achievement Award in 2004, for his exceptional input to the Indian Steel Industry by the Bengal Chamber of Commerce and Industry.

Oprah Winfrey (29th January, 1954-): Oprah Winfrey is an actress, a philanthropist, publisher and producer. She is famous for hosting her own talk show from 1986 to 2011 which achieved internationally popularity. She was both the youngest news anchor and the first black female news anchor at Nashville's WLAC-TV in 1976. She even acted in films like The Colour Purple (1985), Beloved (1998), The Bee (2007) and The Princess and the Frog (2009). She became the narrator of the US version of the BBC nature program Life for Discovery, 2010. Winfrey published O, The Oprah Magazine from 2004 to 2008. She was awarded the Presidential Medal of Freedom in 2013.

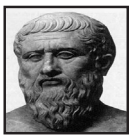
Osho (11th December 1931- 19th January 1990): Osho is an Indian spiritual leader with a worldwide recognition for his preaching on doctrine of Eastern mysticism, individual devotion, and sexual freedom. He is also known as Acharya Rajneesh. He travelled throughout India in 1960s as a public speaker. He was criticized for his views on socialism, Mahatma Gandhi and institutionalized religions. He also advocated a more open attitude towards sexuality. He took a role of spiritual teacher having remarkable impact on Western New Age which increased markedly since his death. He died on 19th January 1990 in Pune because of heart failure.



Oscar Wild (16 October 1854- 30 November 1900): Oscar Wild was an Irish playwright, novelist, essayist, and poet. He is remembered for his great novel 'The Picture of Dorian Gray', his plays, as well as the circumstances of his imprisonment and early death. He published his

first collection of poems in 1881. In 1882, he undertook an American lecture tour, delivered a staggering 140 lectures in just nine months. His work 'The Happy Prince and Other Tales' were a collection of children stories. His most notable plays were A Woman of No Importance (1893), An Ideal Husband (1895) and The Importance of Being Earnest (1895).

Plato (428 BCE- 348 BCE): Plato was a philosopher, as well as mathematician, in Classical Greece. He is considered an essential figure in the development of philosophy, especially the Western tradition, and founded the Academy in Athens, the first institution of higher learning in the Western world.



Pope Francis (17th December, 1936-): Jorge Mario Bergoglio is the 266th and current Pope of the Catholic Church (becoming Pope Francis), a title he holds ex officio as Bishop of Rome, and Sovereign of the Vatican City.

Pierre Cardin (2nd July, 1922): Pierre Cardin is an Italian-born French fashion designer. He was appointed as the UNESCO Goodwill Ambassador in 1991. News of Pierre Cardin's death spread quickly in December which was a complete hoax.

Petros Sampras (12th August 1971): Petros Sampras was one of the greatest American tennis players who started his career in1988. He holds the title of world No. 1 earning the nickname 'Pistol Pete'. He played his last game against Andre Agassi in US Open's final and won. He is the first professional to break Roy Emerson's pre-Open Era record of 12 Grand Slam singles titles and retired with 14 titles which includes seven Wimbledon, five US Open, and two Australian Open. He also won five of ATP World Tour Finals and two Grand Slam Cups and still holds the ATP record of six year-end No. 1 rankings, which were in consecutive years from 1993 through 1998.

Pele (23rd October 1940-): Pele is the retied football player who played forward for Brazil. He is considered to be most successful league goal scorer in the world, with 541 league goals. In 1999, Pelé was elected as an Athlete of the Century. Time named him in their list of 100 most influential people of the 20th century. In 2013 he received the FIFA Ballon d'Or Prix d'Honneur in recognition of his career and achievements as a global icon of football.

Pingali Venkayya (2nd August, 1876- 4th July, 1963): Pingali Venkayya was an Indian freedom fighter. He was designer of the national flag. The AIR (All India Radio) Vijayawada building was named after Pingali in 2015 to honour his contribution in the designing of the Indian flag. A postage stamp was issued to commemorate him in 2009.

Pope Benedict 16th (16th April 1927-): Pope Benedict 16th is a religious figure and served as Pope of the Catholic Church from 2005 till his resignation in 2013. He was elevated to the papacy on 19th April, 2005, upon the death of Pope John Paul II, and celebrated his Papal Inauguration Mass five days later. He resigned from his post on February 28, 2013 and became the

first pope to step down from his post after Gregory XII in 1415. He was succeeded by Pope Francis on 13 March 2013.

Pranab Mukherjee (11th December 1935-): Pranab Mukherjee is an Indian politician and government official. He is the 13th and current President of India. He succeeded Pratibha Patil (2007–12), India's first woman president. Mukherjee has also served as the Union Finance Minister from 2009 to 2012. He has authored several books, including Beyond Survival: Emerging Dimensions of Indian Economy (1984) and Challenges Before the Nation (1993).



Prof. Max Mueller (6th December 1823 – 28th October 1900): Max Mueller was a renowned German indologist and Sanskrit scholar. He was scholar of comparative language, religion, and mythology. Müller's special areas of interest were Sanskrit philology and the religions of India. The Goethe Institutes in India are named Max Müller Bhavan in his honour. Some of his most important works include Essays on the Science of Religion (1869), vol. 1 of Chips from a German Workshop; Introduction to the Science of Religion (1873); and Lectures on the Origin and Growth of Religion (1878).

Pythagoras (C 570 – C 495 BC): Pythagoras of Samos was a Greek mathematician and philosopher. He is considered as the founder of the movement called Pythagoreanism. He is remembered today for his famous theorem in geometry, the 'Pythagoras Theorem'.

Pt. Ravi Shankar (7th April 1920 – 11th December 2012): Ravi Shankar was an Indian musician and composer. He is best known for popularizing the sitar and Indian classical music in Western culture. After serving as director of All-India Radio, he began to tour India and the United States, winning three Grammy Awards and collaborating with many notable American musicians, including George Harrison and Philip Glass. Shankar wrote two autobiographies named My Life, My Music (1969) and Raga Mala (1999). He was awarded the Bharat Ratna in 1999.



P.C. Sorcar (23th February 1913 – 6th January 1971): P.C. Sorcar was a famous magician in the mid-1930s. He preformed internationally throughout 1950s and 1960s. He is often regarded as the Leonardo De Vinci of India as he was mathematician, musician, an accomplished aviator and an Indian classical ballet dancer. He even wrote a book "Histroy of Magic" which was published in 1970. Sorcar died of a heart attack at the age of 58 in Ashaikawa, Hokkaido, Japan, on January 6, 1971, where he was performing.

Pallonji Shapoorji Mistry (1929): Pallonji Shapoorji Mistry is a Parsi, Irish Indian construction tycoon and chairman of Shapoorji Pallonji Group Forbes Textiles and Eureka Forbes Limited. He is the single largest shareholder in India's largest private conglomerate Tata Group. He is titled as the Phantom of Bombay House. Pallonji is also

the former Chairman of Associated Cement Companies. He gave up his Indian citizenship in 2003 to obtain Irish citizenship, because India did not yet allow dual citizenship. His son Cyrus is chairman of Tata Sons. A short biography of Mistry was written in a 2008 book by Manoj Namburu titled The Moguls of Real Estate.

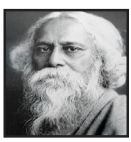
PT Usha (27th June 1964-): P T Usha is an Indian field and track athlete. She is one of the most famous and successful female athlete India has ever produced. She earned the titles such as Queen of Indian Track and Payyoli Express owing to her extra-ordinary performance at the track. She has won 101 international medals so far. She has been conferred with the Padma Shri and the Arjuna Award in 1984.



Panini (450–350 B.C.): Panini is known for his contribution to classical Sanskrit grammar. Panini's rules of grammar rely on two simple concepts: that all nouns are derived from verbs, and that all words derivation takes place through suffixes. Panini's work became known in 19th century Europe. India released a stamp in honour of Panini in 2004.

Paul Allen (21st January 1953-): Paul Allen is the founder and chairman of Vulcan Inc but best known as a co-founder of Microsoft, alongside Bill Gates. He was estimated to be the 51st richest person in the world. He has also invested in technology and media companies, real estate holdings, and stakes in other companies. Allen has financed a variety of wildlife conservation projects. He was conferred with the Champion for Global Health Award (2015) by Centre for Infectious Disease Research, for his leadership and efforts to fight Ebola.

Rabindranath Tagore (7th May 1861 – 7th August 1941): Rabindranath Tagore was a painter, author, screenwriter, poet, and playwright. Tagore became the first non-European person to win the Nobel Prize in Literature in 1913. Some of his best-known works are Gitanjali (Song Offerings), Gora (Fair-Faced) and Ghare-Baire (The Home and the World). His compositions were taken up as the national anthem for India and Bangladesh.



Rudyard Kipling (30th December 1865 – 18th January 1936): Kipling was a poet, novelist and a short story writer. His famous works include The Jungle Book (1894), Kim (1901), and many short stories including 'The Man Who Would Be King' (1888). Some of known poems include 'Mandalay' (1890), 'Gunga Din' (1890). He received the Nobel Prize for Literature in 1907.

Raja Rammohan Roy (22nd May 1772 – 27th September 1833): Raja Rammohan Roy was an Indian religious, social, and educational reformer. He is renowned for his efforts in the abolishment of the practice of sati. He is often called the father of modern India.

R. K. Narayan (10th October 1906 – 13th May 2001): R. K. Narayan was an Indian writer and journalist. Some of his notable works include The English Teacher (1945), Waiting for the Mahatma (1955), The Guide (1958), The Man-Eater of Malgudi (1961), The Vendor of Sweets (1967), and A Tiger for Malgudi (1983). He received AC Benson Medal from the Royal Society of Literature, the Padma Bhushan and the Padma Vibhushan.



Razia Sultan (1205 – 13th October, 1240): Razia Sultan was the female Muslim female ruler. She was the Sultan of Delhi from 1236 to May 1240.

Robert Clive (29th September 1725 – 22nd November 1774): Robert Clive was the Commander-in-Chief of British India. He defeated the French and made possible 200 years of British rule in the Indian subcontinent. He defeated Siraj-ud-Daula at the Battle of Plassey in 1757.

Richard Branson (18th July 1950-): Sir Richard Charles Nicholas Branson, founder of Virgin Group is an English businessman and investor. His first business project was a magazine called 'Student' at the age of sixteen. Then in 1970, he set up a mail-order record business and in 1972, he opened a chain of record stores. Virgin Records, later came to be known as Virgin Megastores. In 1980s he set up Virgin Atlantic expanding Virgin Records music label. Forbes listed Branson's estimated net worth at US $5 billion in July 2015. He became a founding sponsor of the International Centre for Missing & Exploited Children in 1999.

Raghuram Rajan (3rd February 1963-): Raghuram Rajan a financial economist, is the current and the 23rd Governor of the Reserve Bank of India. He succeeded Duvvuri Subbarao on 5th September 2013. He was appointed as the Economic Counsellor and Director of Research at the International Monetary Fund in 2003. His biggest achievement as s RBI governor was his success in bringing down retail inflation to 3.78% in July 2015 from 9.8% in September 2013. Rajan was awarded the Fischer Black Prize in 2003.

Raj Kapoor (14th December 1924 – 2nd June 1988): Raj Kapoor was a film actor, director and producer of Hindi films. He was also known as 'the show man' of Indian Cinema. He has won two National Film Awards and nine Filmfare Awards. He was nominated twice for the Palme d'Or grand prize at the Cannes Film Festival for his films Awaara (1951) and Boot Polish (1954).



Rahul Bajaj (10th June 1938-): Rahul Bajaj is an Indian businessman, industrialist, politician, and a member of the Indian Parliament. Bajaj is the Chairman of the Bajaj Group, which ranks among the top 10 business houses in India. He was awarded the Padma Bhushan in 2001. In 2015, Forbes estimated his net worth to be US $ 2.7 Billion making him one of India's top 50 richest persons.

Raja Ravi Varma (29th April 1848 – 2nd October 1906): Raja Ravi Varma was a renowned Indian painter who greatly influenced the future generations of Indian painters. He is known for his amazing paintings, which revolve mainly around the great epics of Mahabharata and Ramayana. Varma was awarded the Kaisar-i-Hind Gold by Lord Curzon, on behalf of the British King Emperor. In 2013, a crater on Mercury was named in the honour of this greater Indian painter.

RK Laxman (24th October 1921 – 26th January 2015): R. K. Laxman was an Indian cartoonist who created the comic strip 'You Said It', featuring the "Common Man"—a silent observer representing the average Indian. He was awarded The Ramon Magsaysay Award in 1984 in the category of Journalism, Literature, and the Creative Communication Arts (JLCCA). He was also awarded the Padma Vibhushan in 2005. He wrote few novels such as The Hotel Riviera (1988) and The Messenger (1993), the short-story collection Servants of India (2000), and an autobiography, The Tunnel of Time (1998).

Rakesh Sharma (13th January 1949-): Rakesh is a former Indian Test Pilot and Cosmonaut. He was the first Indian, and the only Indian national to travel in space. He was conferred with the honour of Hero of Soviet Union upon his return from space. The Hero of Soviet Union and the Ashoka Chakra Award were two of the accolades given to honour his achievements in space travel.



Ratan Tata (28th December -): Ratan Tata is an Indian businessman, investor, philanthropist and chairman Emeritus of Tata Group (1991–2012). He was succeeded by Cyrus Mistry on 28th December, 2012. Under his leadership, Tata Tea acquired Tetley, Tata Motors acquired Jaguar Land Rover and Tata Steel acquired Corus. Tata was awarded the Padma Bhushan in 2000 and Padma Vibhushan in 2008. He was also awarded the Lifetime Achievement Award by Rockefeller Foundation in 2012.



Ram Manohar Lohia (23rd March 1910 – 12th October 1967): Ram Manohar Lohia was an Indian Freedom Fighter, Socialist and Political Leader. Lohia sparked controversy when he wrote a pamphlet "25000 rupees in a day" stating that the amount of money spent on then prime minister Jawahar Lal Nehru was way more than the country could afford when majority of the population lived on 3 annas a day. He was bestowed with numerous nobilities including the naming of Dr. Rammanohar Lohia Hospital after him to honour his memory.

Robert Boyle (25th January 1627 – 31st December 1691): Robert Boyle was an Anglo-Irish philosopher, inventor and writer. He discovered Boyle's Law – the first of the gas laws relating the pressure of a gas to its volume. Boyle is regarded as the first modern chemist, and also as one of the founders of modern chemistry. Among his most influential writings was The

Sceptical Chymist (1661) which is seen as a cornerstone book in the field of chemistry. As a founder of the Royal Society, he was elected a Fellow of the Royal Society (FRS) in 1663.

Ruskin Bond (19th May 1934-): Ruskin Bond is an eminent contemporary Indian writer of British descent. The Indian Council for Child Education recognized his role in the growth of children's literature in India. Some of other notable works of Ruskin Bond include Blue Umbrella, A Flight of Pigeons, The Room on the Roof, Vagrants in the Valley, The Lamp is Lit and Funny Side Up. He was awarded the Sahitya Academy Award in 1992 for Our Trees Still Grow in Dehra, for his published work in English, the Padma Shri in 1999 and Padma Bhushan in 2014.



Socrates (470 BCE- 399 BCE): Socrates was a classical Greek (Athenian) philosopher credited as one of the founders of Western philosophy known chiefly through the accounts of classical writers, especially the writings of his students Plato and Xenophon and the plays of his contemporary Aristophanes. At the age of 70, he was put to trial on a charge of impiety and sentenced to death by poisoning (the poison probably being hemlock) by a jury of his fellow citizens.

Rohit Bansal (not available): Rohit Bansal is one of the youngest entrepreneurs of India. Bansal cofounded Snapdeal along with his school friend Kunal Bahl on 4th February, 2010. Currently he is the COO of the e-commerce platform Snapdeal.

Ronald Reagan (6th February, 1911 – 5th June, 2004): Ronald Wilson Reagan was the 40th President of the United States and the Governor of California. Reagan initially had chosen a career in entertainment, appearing in more than 50 films. He was honoured with numerous prestigious awards worldwide, including American Presidential Medal of Freedom, Republican Senatorial Medal of Freedom, Congressional Gold Medal, Honorary Knight Grand Cross of the Order of the Bath- one of the highest British order, and Japan's Grand Cordon of the Order of the Chrysanthemum.

Steve Jobs (24th February 1955- 5th October 2011): Steve Jobs was as an American trailblazer of the personal computer revolution of the 1970s along with an engineer, inventor. He co-founded Apple Computers with Steve Wozniak. In 2007, Jobs was named the most powerful person in business by Fortune magazine.

Sigmund Freud (6th May, 1856 – 23rd September, 1939): Sigmund Freud was a physiologist, psychologist and influential thinker of the early twentieth century. Freud was the founding father of Psychoanalysis (the talking cure), a method for treating mental illness and also a theory which explains human behaviour.



Sarojini Naidu (13th February 1879- 2nd March 1949): A poet, freedom fighter and great orator, Sarojini Naidu was the first Indian woman to become the President of the Indian National Congress

and also the first woman to be the governor of a state in India. She was famously known as Bharatiya Kokila (The Nightingale of India). Some of her famous works are 'The golden threshold (1905)', 'The bird of time (1912)', and 'The broken wing (1912)' which attracted huge readership.

Srinivasa Ramanujan (22nd December 1887- 26th April 1920): Noted Indian mathematician and autodidact Srinivasa Ramanujan is known for his extraordinary contributions to mathematical analysis, number theory, infinite series, and continued fractions. His papers were published in English and European journals. In 1918, he was elected to the Royal Society of London.

S. Radhakrishnan (5th September 1888 – 17th April 1975): Sarvepalli Radhakrishnan, was a philosopher and statesman. He was the first Vice President of India (1952–1962) and the second President of India (1962 to 1967). His birthday is celebrated as Teachers' Day on 5th September. He was awarded the Bharat Ratna in 1954.

Swami Vivekanand (12th January 1863 – 4th July 1902): Swami Vivekanand, was a monk and philosopher. He founded the Ramakrishna Math and the Ramakrishna Mission. He is best known for his speech, 'Sisters and brothers of America ...,' at the World's Religions in Chicago in 1893. His birthday is celebrated there as National Youth Day.

Sardar Vallabhbhai Patel (31st October 1875 – 15th December 1950): Sardar Vallabhbhai Patel was an Indian barrister and statesman. Patel was the first Deputy Prime Minister and Home Minister of India. He was also referred to as 'Iron Man of India'. Vallabhbhai was posthumously awarded the Bharat Ratna in 1991. His birthday is celebrated as Rashtriya Ekta Diwas (National Unity Day).

Sachin Tendulkar (24th April 1973-): Sachin Tendulkar is a former Indian cricketer and captain. He is considered to be the greatest cricketer in the world of cricket. He is the first sportsperson and youngest person to be conferred the Bharat Ratna. He received a number of awards including Arjuna Award (1994), Rajiv Gandhi Khel Ratna (1997), Padma Shri (1999) and Padma Vibhushan (2008).

Salim Ali (12th November 1896 – 20th June 1987): Salim Ali is one of the greatest Indian ornithologists and naturalists of all time. He is also known as the 'birdman of India'. Ali was one of the very first scientists to carry out systematic bird surveys in India and abroad.

Shabana Azmi (18th September 1950-): Shabana Azmi is a renowned actress of film, television, theatre and a social activist. She has the record of five National Film Awards for Best Actress. She is also the Goodwill Ambassador of the United Nations Population Fund (UNPFA).

Sabeer Bhatia (30th December 1968-): Sabeer Bhatia is an Indian entrepreneur and co-founder of Hotmail, one of the first free e-mail services in the world.

Sir Arthur Conan Doyle (22nd May 1859 – 7th July 1930): Sir Arthur Ignatius Conan Doyle was a British writer and physician. He is renowned for his fictional stories about the detective Sherlock Holmes, which are generally considered milestones in the field of crime fiction.

Steffi Graf (14th June 1969-): Steffi Graf is a former German tennis player who won 22 Grand Slam singles titles. She and Margaret Court are the only players, male or female, to win 3 grand slams in a calendar year 5 times (1988, 1989, 1993, 1995 and 1996). Graf dominated women's tennis in the late 1980s and '90s.

Satyajit Ray (2nd May 1921 – 23rd April 1992): Satyajit Ray one of the greatest filmmakers of the 20th century, started his career as a commercial artist. He was a director, producer, screenwriter, and writer. Ray directed 36 films, including feature films, documentaries and shorts. Ray's first film, Pather Panchali (1955), won eleven international prizes, including the Best Human Document at the 1956 Cannes Film Festival. Ray was honoured with Bharat Ratna in 1992 and Dadasaheb Phalke Award in1965 and with the Padma Bhushan in 1965. He received an honorary 'Hommage à Satyajit Ray' award at the 1982 Cannes Film Festival. He died on 23 April 1992 at the age of 71.



Stephen Hawking (8th January 1942-): Stephen Hawking is a physicist, cosmologist, author and the Director of Research at the Centre for Theoretical Cosmology at the University of Cambridge. He is the member of the Royal Society of Arts, a lifetime member of the Pontifical Academy of Sciences, and a recipient of the Presidential Medal of Freedom, the highest civilian award in the United States. He authored the book 'A Brief History of Time'.

Shah Jahan (5th January 1592 – 22nd January 1666): Shahabuddin Muhammad Shah Jahan was the fifth Mughal Emperor of India. He was son of Jahangir and his Hindu wife, Taj Bibi Bilqis Makani and became emperor after the death of his father in 1627. His reign was considered as the golden age of Mughal architecture. The Jama Masjid, the Wazir Khan Mosque, the Moti Masjid, the Shalimar Gardens, sections of the Lahore Fort, the Jahangir mausoleum are the renowned building built by him.

Saadat Hassan Manto (11th May 1912 – 18th January 1955): Sadat Hasan Manto was a Pakistani writer. He was one of the greatest writers of short stories and author of over 100 radio plays and features, remains a model for 21st-century writers for plot construction, bitter realism, and whimsical dialogue. Some of his well-known Urdu short stories include Bu, Khol Do, Thanda Gosht, and Toba Tek Singh. On 18th January 2005, the fiftieth anniversary of his death, Manto was commemorated on a Pakistani postage stamp.

Sachin Bansal (5th August 1981): Sachin Bansal is an Indian software engineer and a successful entrepreneur. He is the cofounder of the Indian e-commerce giant Flipkart. Sachin won the Entrepreneur of the Year award for the year 2012-2013. Sachin along with Binny Bnasal, the other co-founder were named the 86th richest person in India with a net worth of $1.3 billion by Forbes India Rich List.

Saeed Jaffrey (8th January 1929 – 15th November 2015): Saeed Jaffrey was an Indian actor. He was considered to be Britain's highest-profile Asian actor and played the leading roles in the movie My Beautiful Laundrette (1985) and television series Tandoori Nights (1985–1987) and Little Napoleons (1994). His famous Bollywood outings include "Chashme Buddoor", "Masoom", "Kissi Se Na Kehna", "Mandi", "Mashaal" "Ram Teri Ganga Maili", "Ram Lakhan", "Ajooba" and "Henna". In 1995 he was awarded an OBE (Order of the British Empire) in recognition of his services to drama, the first Asian to receive this honour.



Salman bin Abdulaziz Al Saud (31st December 1935-): Salman bin Abdulaziz Al Saud is the King of Saudi Arabia, Custodian of the Two Holy Mosques and the head of the House of Saud. Salman was crowned as the new King of Saudi Arabia on 23rd January 2015 following the death of his half brother, King Abdullah. Previously he has served as the Deputy Governor and then the Governor of Riyadh for 48 years from 1963 to 2011. He was also appointed as Minister of Defence in 2011. He received the Lifetime Achievement Award of Al-Turath Charity Foundation in the field of urban heritage in 2013.

Saina Nehwal (17th March 1990-): Saina Nehwal is an ace Indian badminton player. She is currently ranked no. 1 in the world by Badminton World Federation Women's Singles 2015. She became the first Indian player to win a medal in Olympics by winning the Bronze medal at the London Olympics 2012 on 4th August 2012. Saina also became the first Indian woman to win at medal at the BWF World Championship by winning silver at the 2015 edition of the championship. She is the recipient of the Arjuna award (2009), Padma Shri (2010) and the Rajiv Gandhi Khel Ratna award (2009–2010).



Satish Dhawan (25th September 1920 – 3rd January 2002): Satish Dhawan was an Aerospace engineer. He is known as the father of experimental fluid dynamics research in India and one of the most eminent researchers in the field of turbulence and boundary layers. He succeeded Vikram Sarabhai, the founder of the Indian space programme, as Chairman of the Indian Space Research Organisation (ISRO) in 1972. He was also the Chairman of the Space Commission and Secretary to the Government of India in the Department of Space. After his death in 2002, the Indian satellite launch centre at Sriharikota, Andhra Pradesh, was

renamed as the Prof. Satish Dhawan Space Centre. He was awarded with the Padma Vibhushan (1981) and Padma Bhushan (1971).

Salman Rushdie (19th June 1947-): Salman Rushdie is one of the most prominent writers of the twentieth century. He is known to combine magical realism with historical fiction. Some of his best known novels are Midnight's Children (1981), Joseph Anton (2012), The Moor's Last Sigh (1995) and The Satanic Verses (1988), for which he was accused of blasphemy against Islam. Rushdie received the Booker Prize in 1981 for Midnight's Children. Rushdie is also a Fellow of the British Royal Society of Literature.



Samudragupta (335 – c. 375 CE): Samudragupta was the third ruler of the Gupta Dynasty and one of the greatest monarchs in the Indian history. He generally is considered the epitome of an "ideal king" of the "golden age of Hindu history," as the period of the imperial Guptas (320–510 ce) is often called. The western scholars equate him with Napoleon and call him Indian Napoleon due to his extensive military conquests.

Sheikh Hasina (28th September 1947-): Sheikh Hasina is a politician and leader of the Awami League political party. Hasina is the current Prime Minister of Bangladesh and has previously served as Prime Minister from 1996 to 2001. She is sometimes referred-to as Sheikh Hasina Wazed. In 1998, she was awarded the 'M K Gandhi Award' by Norway's 'Mahatma M K Gandhi Foundation' for promoting peaceful understanding and democracy in Bangladesh. She was also awarded the 'Mother Teresa Award' by the 'All India Peace Council' in 1998.

Serena Williams (26th September 1981-): Serena Williams is one of the most dominant names in the world tennis. She is an American tennis player and currently ranked as the World's no. 1 in women's singles tennis. She has won 21 Grand Slam singles titles and stands third on the all-time list behind Margaret Court (24) and Steffi Graf (22). Her win at Wimbledon 2015 made her the oldest Grand Slam singles champion in the Open era.

Sania Mirza (15th November 1986-): Sania Mirza is India's ace tennis player. She is currently ranked as World no. 1 in the women's doubles. Mirza is the most successful female Indian tennis player and also one of the highest paid athletes in the country. She has been awarded with many awards including the Arjuna award (2004), Padma Shri (2006), Rajiv Gandhi Khel Ratna (2015) and many more.



Shashi Tharoor (9th March 1956-): Shashi Tharoor is an author, politician, and former international civil servant. He is the member of the Indian National Congress and served as an official spokesperson for the party from January to October 2014. Some of his famous books are The Great Indian Novel (1989), Riot (2001) and Show Business (1992). He was also appointed as the International Adviser to the International Committee of the Red Cross in Geneva for the period 2008-2011.

Satya Nadella (19th August, 1967-): Satya Narayana Nadella is an Indian American businessman. He was appointed as the CEO of Microsoft on 4th February 2014. He has been working with Microsoft since 1992, after he left Sun Microsystems.



Shiv Nadar (14th July 1945-): Shiv Nadar is the noted Indian business tycoon. He is the founder of Hindustan Computers Limited (HCL) and Shiv Nadar Foundation. He is nicknamed 'magus', which in Old Persian stands for 'wizard'. He was presented with the Padma Bhushan in 2008 for his great contributions to the IT industry. According to Forbes richest people list, Nadar has a net worth of $12.2 billion.

Sir Edwin Lutyens (9th March 1869 – 1st January 1944): Sir Edwin Lutyens was one of England's most prominent and innovative architects belonging to the 19th and early 20th centuries. Lutyens along with Sir Herbert Baker were the chief architects of the India Gate and Rashtrapati Bhavan. Lutyens is also known as "the greatest British architect" and to recognise his contribution, New Delhi is also known as "Lutyens' Delhi". He was knighted in 1918 and elected a Fellow of the Royal Academy in 1921.

Steven Spielberg (18th December 1946-): Steven Spielberg is one of the most renowned screenwriters, Directors and Producers. Some of his famous films include as Schindler's List, The Color Purple, E.T.: The Extra-Terrestrial, Saving Private Ryan, Catch Me If You Can, Lincoln and Bridge of Spies. He co-founded the studio DreamWorks SKG in 1994, which was purchased by Paramount Pictures in 2005. Spielberg has won three Academy Awards.

Suchitra Sen (6th April 1931 – 17th January 2014): Suchitra Sen was an Indian actress who starred in more than 50 Bengali films as well as 7 Hindi movies. She was the first Indian actress to be honoured by an international film festival. She won the silver prize for best actress at the Moscow International Film Festival for her film Saat Paake Bandha. Sen was awarded the Padma Shri in 1972 and Banga Bibhushan in 2012.

Shekhar Kapur (6th December 1945-): Shekhar Kapur is an Indian actor and director. Kapur is best known for his films Bandit Queen (1994) and Elizabeth (1998). His movies Elizabeth (1998) and The Golden Age (2007) won the BAFTA Award for Best Film, and two Academy Awards. He was awarded the Padma Shri in 2000. He was also appointed as one of the Jury Members (International Competition) at the 63rd Cannes Film Festival.



Sylvester Stallone (6th July 1946-): Sylvester Stallone is an American Film Actor, Screenwriter, Director and Producer. Stallone is best known for portraying boxer Rocky Balboa, Vietnam War veteran John Rambo and Barney Ross in the three The Expendables films from 2010 to 2014. In 1977, Stallone was nominated for two Academy Awards for Rocky, Best Original Screenplay and Best Actor.

Sundar Pichai (12th July 1972-): Sundar Pichai is a computer engineer and the current CEO of Google Inc. Pichai had joined Google in 2004 as a product manager and led the innovative efforts for several of Google's products including Google Chrome and Chrome OS which were highly successful.



Sunil Gavaskar (10th July 1949-): Sunil Gavaskar is a former Indian cricketer considered to be among the best opening batsmen in cricket history. His record for most centuries (34) in test cricket was broken by Sachin Tendulkar in December 2005. He became the first player to score 10000 runs in Test Cricket. Gavaskar is recipient of awards such as Padma Shri, Padma Bhushan and Col CK Nayudu Lifetime Achievement Award for Cricket in India.

Sunita Williams (19th September, 1965-): Sunita Williams is an American astronaut. She holds the records for total spacewalks by a woman (seven) and most spacewalk time for a woman (50 hours, 40 minutes).Williams worked for the International Space Station as a member of Expedition 14 and Expedition 15. She also served as a flight engineer on Expedition 32 and then commander of Expedition 33 in the year 2012.

Thomas Edison (February 11 1847- October 18, 1931): Thomas Alva Edison was an American inventor and businessman. Some of his most famous inventions were the phonograph, motion picture camera and electric light bulb which influenced the day to day life of people around the world. Edison is also known as 'the Wizard of the Menlo Park'.

Tansen (1506 - 1589): Tansen was one of the most renowned Indian classical music composers, musicians and vocalists. He is regarded as the greatest of all musicians India has ever produced till date. Tansen was considered as one of the Navaratnas (Nine Gems) in the court of Emperor Akbar. He has also composed several Ragas that have been the foundation of classical music like Bhairavi, Darbari Todi, Darbari Kanada, Malhar, Sarang and Rageshwari.

Shakuntala Devi (4th November 1929 – 21st April 2013): Shakuntala Devi was a writer and a mental calculator. She was a mathematical prodigy, also known as the 'human computer'. Shakuntala Devi was famous for her complex problem-solving skills without the aid of any mechanical device. Her mathematical talent earned her a place in the 1982 edition of The Guinness Book of World Records. Some of her best-known works are 'Figuring: the Joy of Numbers', 'Astrology for You', 'Perfect Murder' and 'The World of Homosexuals'.



Tim Cook (1st November 1960-): Tim Cook is an American business executive, and is the Chief Executive Officer (CEO) of Apple Inc. Cook took control of Apple after its founder and long-time leader Steve Jobs died in 2011. Cook joined Apple in 1998 as senior vice president of worldwide operations. Cook has also served as the executive vice president of worldwide sales and

operations and was chief operating officer until he was named the CEO of Apple on August 24, 2011, when he succeeded Steve Jobs.

Tipu Sultan (20th November 1750 – 4th May 1799): Tipu Sultan was the ruler of the kingdom of Mysore. He won against the British in the Second Anglo-Mysore War, and negotiated the 1784 Treaty of Mangalore with them after his father Hyder Ali suddenly died from cancer in December 1782 during the Second Anglo-Mysore War. He is known for the use of the Mysorean rockets and also wrote a military manual known as Fathul Mujahidin, which is considered a pioneer in the use of rocket artillery. Tipu was killed on 4th May 1799 while defending his fort of Srirangapatna.



Todar Mal (died in 8th November 1589): Raja Todar Mal was a Khatri Rajput, an able administrator and an exemplary finance minister. He was one of the 'Navratnas' of Akbar's courts. He introduced an excellent land revenue system. In 1582, the title Diwan-I- Ashraf was bestowed upon him by the Emperor. The Kashi Vishwanath Temple was rebuilt in 1585 by Todar Mal.

Toni Morrison (18th February 1931-): Toni Morrison is a Nobel Prize- and Pulitzer Prize-winning American novelist, editor and professor. Some of her best known novels are The Bluest Eye, Song of Solomon and Beloved. She has won the Pulitzer Prize and the American Book Award in 1988 for Beloved and the Nobel Prize in 1993. She received the Presidential Medal of Freedom on May 29, 2012.

Usian Bolt (21st August 1986-): Usain Bolt is a world renowned sprinter and an Olympic gold winner. He has won gold medals in the 100-metre and 200-metre races at both the Beijing 2008 Olympic Games and the London 2012 Games. He is the first man to win six Olympic gold medals in sprinting, and an eleven-time World champion. At the 2009 world championships, Bolt shattered his own 100-metre world record of 9.69 sec, by winning the event final in 9.58 sec. He has been nicknamed as 'Lightning Bolt', and awarded with the IAAF World Athlete of the Year, Track & Field Athlete of the Year, and Laureus World Sportsman of the Year.

Tulsidas (1497/1532–1623): Goswami Tulsidas was a great Hindu poet saint, reformer and philosopher. He composed various popular books. He is best known as the author of the epic Ramcharitmanas. Tulsidas was believed in his lifetime to be a reincarnation of Valmiki, the composer of the original Ramayana in Sanskrit. He is also considered to be the composer of the Hanuman Chalisa, a popular devotional hymn dedicated to Hanuman, the divine devotee of Rama.



Vincent Van Gogh (30th March 1853 – 29th July 1890): Vincent van Gogh was a Dutch painter and one of the most well known post-impressionist artists; for whom colour was the chief symbol of expression was born in Groot-Zundert, Holland. He remained poor and virtually unknown throughout his life.

V. S. Naipaul (17th August 1932-): Sir Vidiadhar Surajprasad Naipaul is a Trinidadian-British writer of Indian descent. Some of his best known novels are A House for Mr. Biswas (1961), A Bend in the River (1979) and A Way in the World (1994). He was awarded Nobel Prize in 2001 for his novel, Half a Life.

Varahamihira (505–587 CE): Varahamihira is an Indian philosopher, astronomer, and mathematician. He is considered to be one of the nine jewels (Navaratnas) of the court of legendary ruler Yashodharman Vikramaditya of Malwa. The most famous work by Varahamihira is the Pancasiddhantika (The Five Astronomical Canons).

Ved Vyas: Ved Vyas was the first and greatest acharya of Sanatan Dharma. He is responsible for classifying the four Vedas, wrote the 18 Puranas and recited the great Mahabharata. Vyasa is also considered to be one of the seven Chiranjivins (long lived, or immortals), who are still in existence according to Hindu belief. The festival of Guru Purnima is dedicated to him.

Verghese Kurien (26th November 1921 – 9th September 2012): Verghese Kurien was the founder Chairman of the National Dairy Development Board. Kurien is better known as the Father of the White Revolution in India. He is also called as the Milkman of India. He led the Operation Flood which made India, a previously milk-deficient nation the largest milk producer in the world. Under his able direction and guidance, around 30 cooperative institutions like AMUL, IRMA, and NDDB thrived. He is the recipient of awards such as Padma Shri (1965), Padma Bhushan (1966) and Padma Vibhushan (1999) by the Government of India, the Ramon Magsaysay Award (1963), and World Food Prize (1989).



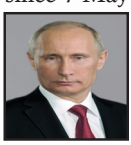
Vijay Tendulkar (6th January 1928 – 19th May 2008): Vijay Tendulkar was a playwright and screenwriter who wrote more than 30 full-length Marathi-language plays and numerous one-act plays, short stories, and movie scripts. Some of Tendulkar's most famous plays include Shantata! Court Chalu Ahe (1967; "Silence! The Court is in Session"), Sakharam Binder (1971) and Ghashiram Kotwal (1972; "Ghashiram the Constable"). Tendulkar was awarded the Padma Bhushan (1984) and the Sangeet Natak Akademi Fellowship in 1998.

Vinoba Bhave (11th September 1895 – 15th November 1982): Acharya Vinoba Bhave was a freedom fighter and a spiritual teacher. He is best known as the founder of the 'Bhoodan Movement' (Land-Gift movement). He is considered to be the National Teacher of India and the spiritual successor of Gandhiji. Vinoba was the first recipient of the international Ramon Magsaysay Award for Community Leadership in 1958. He was awarded the Bharat Ratna posthumously in 1983.

Virginia Woolf (25th January 1882 – 28th March 1941): Virginia Woolf was a British writer and essayist. She was one of the foremost modernists of the twentieth century. Her most famous works include the novels Mrs Dalloway (1925), To the Lighthouse (1927) and Orlando (1928), and the book-length essay A

Room of One's Own (1929), with its famous dictum, "A woman must have money and a room of her own if she is to write fiction."

Vladimir Putin (7th October 1952-): Vladimir Putin has been the President of Russia since 7 May 2012, succeeding Dmitry Medvedev. He has served as president (1999–2008, 2012–) of Russia and also was the country's prime minister (1999, 2008–12). Putin's first presidency was marked by high economic growth: the Russian economy grew for eight straight years, seeing GDP increase by 72% in PPP. A number of Putin's actions are regarded by the observers as undemocratic and it was stated that Russia was in "a long process of regression [that] culminated in a move from a hybrid to an authoritarian regime" in view of Putin's candidacy and flawed parliamentary elections. In 2014, Russia was suspended from the G8 group due to its annexation of Crimea. The China International Peace Research Center awarded the Confucius Peace Prize to Putin on 15th November 2011.



Vikram Seth (20th June 1952 -): Vikram Seth is an Indian poet, novelist, and travel writer. Some of his notable works include The Golden Gate (1986), A Suitable Boy (1993), An Equal Music (1999), From Heaven Lake: Travels through Sinkiang and Tibet, Mappings and Beastly Tales and many more. He is the recipient of several awards including Padma Shri (2007), Sahitya Akademi Award (1988), Pravasi Bharatiya Samman (2005), WH Smith Literary Award (1994) and Crossword Book Award (1999). Seth was conferred with a Poet Laureate Award 2015 at the Mumbai Literature Festival.

William Shakespeare (23rd April, 1564- 23rd April, 1616): William Shakespeare was an English poet and playwright, widely regarded as the greatest writer in the English language and the world's pre-eminent dramatist. He is often called England's national poet and the 'Bard of Avon'. His extant works, including some collaboration, consist of about 38 plays, 154 sonnets, two long narrative poems, and a few other verses, the authorship of some of which is uncertain.



Walt Disney (5th December, 1901-15th December, 1966): Walt Disney was an American entrepreneur, animator, and film producer. Along with his brother Roy O. Disney he co-founded The Walt Disney Company. Disney has won 22 Academy Awards and 7 Emmy Awards.

Wilbur (April 16, 1867 – May 30, 1912) & Orville Wright (August 19, 1871 – January 30, 1948): Wilbur and Orville Wright were American inventors and pioneers of aviation. The Wright brothers are credited with inventing and building world's first successful airplane. They are also considered as the fathers of modern aviation. From 1905 to 1907, the brothers developed their flying machine into the first practical fixed-wing aircraft.

Yash Chopra (27th September 1932 – 21st October 2012): Yash Chopra was an Indian director, Script Writer, and Producer in the Hindi cinema. He is also known as the 'King of Romance' of the Indian cinema. He received the Dadasaheb Phalke Award in 2001 and the Padma Bhushan in 2005. Chopra was also presented with the lifetime membership for his contribution to films by BAFTA.

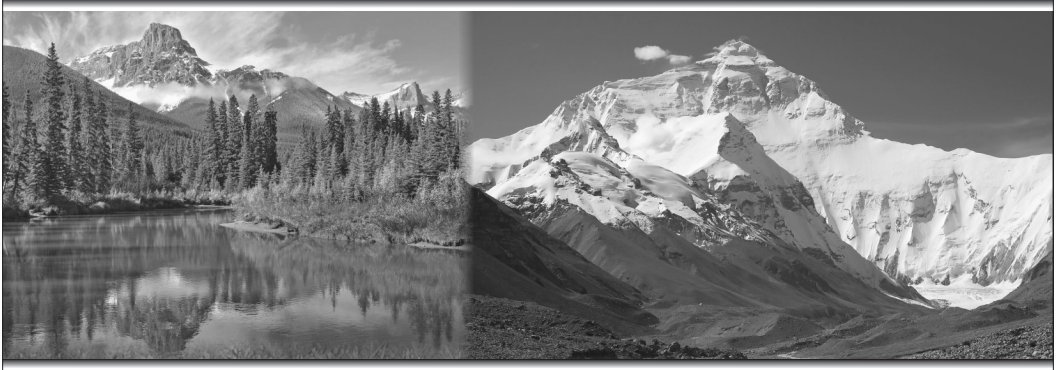
Yuri Gagarin (9th March 1934 – 27th March 1968): Yuri Gagarin was a soviet cosmonaut who in 1961 became the first man to travel into space. His Vostok spacecraft completed an orbit of the Earth on 12 April 1961. Gagarin was awarded the Order of Lenin and given the titles Hero of the Soviet Union and Pilot Cosmonaut of the Soviet Union. He died in 1968 when the MiG-15 training jet he was piloting crashed.

Zohra Sehgal (27th April 1912 – 10th July 2014): Zohra Sehgal was an Indian actress and choreographer. She has acted in many Bollywood films with a career-span of over 60 years. She has been the recipient of many awards including the Sangeet Natak Akademi Award (1963), Padma Shri (1998), Padma Bhushan (2002), Padma Vibhushan (2010) and many more.

Zakir Hussain (9th March 1951): Zakir Hussain is an Indian tabla player, musical producer, film actor and composer. He has been conferred with numerous awards including the Padma Shri (1988), Padma Bhushan (2002), Sangeet Natak Akademi Award (1990), and the United States National Endowment for the Arts's National Heritage Fellowship, the highest award given to traditional artists and musicians in 1999.

Zoroaster (628 BC-551): Zoroaster is an Iranian prophet. He was the founder of Zoroastrianism, or Parsiism, as it is known in India. He is credited with the authorship of the Yasna Haptanghaiti as well as the Gathas, hymns which are at the liturgical core of Zoroastrian thinking.







GEOGRAPHY

- **Physical**
- **India**
- **World**

PHYSICAL GEOGRAPHY–MIND MAP

Universe

- Theories of Development
  - Big bang Theory
  - Steady State theory
  - Osclilating Universe Therory
- Galaxy
- Solar Systems
  - Planets and Moons
  - Cosmic Bodies
- Seasons and Their Formation.
- Earth
- Chronology of the Earth
  - Geological Era
  - Internal Structure

Geomorphology

- Rocks and their classification
- Movement of Earth
  - Factors Affecting movement of Earth (Endogenetic and Exogenetic Forces)
  - Outcomes of Earth's Movement (Folded Mountains, Earthquake, Volcanoes)
- Mountain, Plains, Plateau
  - Process of Formation and their types

Oceanography

- Ocean Structure
- Temperature
- Salinity
- Ocean Deposits
- Ocean Tides
- Ocean Currents
- Coral Reef and Atolls

Atmosphere

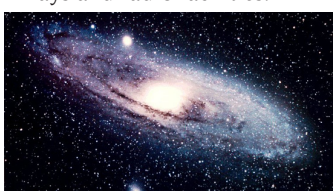
- Atmospheric Structure
- Insolation and Heat Budget
- Winds and their type
  - Planetary Wind (Polar winds, westerlies, Trade winds)
  - Seasonal Winds (Monsoon)
  - Local Winds
- Cyclones and Anti Cyclones
  - Recent Major Cyclones
- Air masses
- Clouds and their types
- Precipitation
  - Conventional, Cyclonic, Orogenic

UNIVERSE

- All existing matters and space as a whole forms Universe. It was termed as cosmos when first conceived as an orderly unit and it study called as cosmology. It is believed to be expanding since its creation in the Big Bang about 13 billion years ago.
- The word universe derives from the old French word *univers,* which in turn derives from the Latin word *universum*. The Latin word was used by Cicero and later Latin authors in many of the same senses as the modern English word is used.

Fast Fact	
Diameter	8.8×1026 m (28.5 Gpc or 93 Gly)
Volume	4×1080 m3
Mass (ordinary matter)	1053 kg
Density	9.9×10–30 g/cm3 (equivalent to 6 protons per cubic meter of space)
Age	13.799±0.021 billion years
Average temperature	2.72548 K
Contents	ordinary (baryonic) matter (4.9%)
	dark matter (26.8%)
	dark energy (68.3%)

- Normal matters all that are visible (star, planet and galaxies) make up less than 5 % of the total mass of the universe rest are made of dark matters. These dark matters are not seen by the astronomers but can study their effects.
- Dark matters are neither antimatter nor black hole. Back holes are gravity lenses that bend light. The instruments which are used by the scientists for these discoveries are cosmology instrument (WMAP and Plank), direct detection experiments include CDMS, XENON, Zeplin, WARP, ArDM and other; indirect detection experiments like Gamma ray detectors, antimatter detectors, X-rays and radio facilities.



Theories of Development

Big Bang Theory

- **Big bang theory** was proposed by Georges Lemaitre in1927.
- According to this theory billion of years ago cosmic matters were in highly compressed state and expansion started with premordial explosion which was bang in superdense ball. These exploded particles are still travelling at a speed of thousands miles per second and gave rise to our galaxies.

Steady State Theory

- The steady state theory was governed by Hermann Boudi and Thomas Gold.
- It is also known as theory of continuos creation. According to this theory universe has always existed and will always exist and will always look essentially the same, so there is no over

all evolution thus balancing the average density despite the exapansion.
- As old galaxies move apart the new galaxies are being formed.

Oscillating Universe Theory

- The Oscillating Universe Theory was advocated by Dr. Alan Sandage.
- This theory postulates that the universe not only expands but it also contracts. The time interval between the two phases are presumed to be billions of years. It is a mixture of both Big Bang an Big Crunch theory.
- According to Dr. Sandage the universe started with an expolsion nearly 12 milion years ago and continues to expand. He was of view that it would expand for another 17 milion years or more. The process of contraction would intiate after the completion of expansion and would continue upto 41million years. The stage of contraction is called as 'implosion'. compress would result into extremely suspended state and then it will expolde once again. It is the latest theory given on evolution of Universe till now.

Galaxy

- A Galaxy is a large collection of stars, gas, dust, and dark matter bounded by gravitational force. At times they are so big that they are called as Island Universe.
- The studies related to the distant spaces with optical and radio telescopes indicate that about 100 galaxies are visible universe. It can be group of clusters and super clusters.
- According to Michael McDonald "Central galaxies have typically been referred to as 'red and dead' - just a bunch of old stars orbiting a massive black hole, and there's nothing new happening."

Sturcture and composition of Galaxy

Elliptical Galaxies :
- Elliptical galaxies can be classified on the basis of their ellipticity, ranging from nearly spherical (E0) to highly elongated (E7). These have low portion of open clusters and low rate of new star formation.

Spiral Galaxies:
- Spiral galaxies have a central nucleus with great spiral arms trailing round it resembling pin wheel **Andromeda Galaxy** and **Milky Way** are the example of such galaxies**.** The spiral arms are thought to be areas of high-density matter, or "density waves".

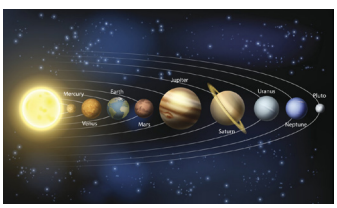
Irregular Galaxies:
- Irregular galaxies are youthful in nature with no sharp and boundary thinning out gradually, these galaxies contain large amount of gas and dust. This type of galaxy is the result of gravitational interaction or collision between formerly regular galaxies.

Solar System

- Solar System constitute of heavenly bodies revolving around an average star known as **SUN.** The measurement unit used for large distance is astronomical unit (AU). One AU represents the distance of 150 million Kms (the distance between earth and sun).
- Heliosphere is a region of space of bubbles dominated by the Sun extending beyond the orbit of it's planets. Bubble in Heliosphere is

created by sun wind, which is a stream of charged gas blowing out of sun.

- The area where sun wind abruptly slows due to the pressure from gas between the stars is called as termination shock. The entire Solar system consists of devoius. **Eight Planets** (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune) ; **Asteroids** (planet like objects)**;** **Meteors** (Chunks of iron and stones)**;** **Comets** (bodies of the dust and forign gases)**.**



Planets Superlatives

1. Biggest Planet-Jupiter
2. Biggest Satellite-Jupiter
3. Blue Planet-Earth
4. Green Planet-Uranus
5. Brightest Planet-Venus
6. Brightest Planet outside Solar System-Sirus
7. Closest Star of Solar System-Proxima
8. Coldest Planet-Neptune
9. Evening Star-Venus
10. Farthest Planet From Sun-Neptune
11. Planet with maximum no. of satellites-Saturn
12. Fastest revolution in solar system-Mercury
13. Hottest Planet-Venus
14. Densest Planet- Earth
15. Fastest Rotation in Solar System-Jupiter
16. Morning Star-Venus
17. Nearest Planet to Earth-Venus
18. Nearest Planet to Sun-Mercury
19. Red Planet-Mars
20. Slowest Revolution in Solar System-Neptune
21. Slowest Rotation in Solar System-Venus
22. Smallest Planet-Mercury
23. Smallest Satellite-Deimos
24. Earth's Twin-Venus
25. Atmosphere like Earth-Titan

INFORMATION BULLETIN

• Human population of the Earth	: Seven billion as of No. 2011, 7.389 billion (as of Dec 2015)
• World Population Growth	: 1.13% as of (2015-16) - 2014 estimate
• Countries of the world	: 196 (195 Excluding Taiwan)
• Earth's Circumference at the Equator	: 24,901.55 miles (40,075.16 km)
• Earth's Circumference between the North and South Poles	: 24,859.82 miles (40,008 km)
• Earth's Diameter at the Equator	: 7,926.28 miles (12,756.1 km)
• Average Distance from the Earth to the Sun	: 92, 935, 700 miles
• Average Distance from the Earth to the Moon	: 238.900 miles/384, 400 km
• Highest Elevation on Earth	: Mt. Everest, Asia : 29,035 feet (8850 m)

• Tallest Mountain on Earth from Base to Peak	: Mauna Kea. Hawaii: 33,480 feet (rising to 13.796 feet above sea level) (10204 m, 4205 m)
• Point Farthest from the Center of the Earth	: The peak of the volcano chimborazo in Ecoador at 20.561 feet (6267 m) is farthest from the center of the Earth due to its location near the equator and the oblateness of the Earth.
• Lowest Elevation on Land	: Dead Sea: 1369 feet below sea level (417,27 m)
• Deepest Point in he Ocean	: Challenger Deep. Mariana Trench. Western Pacific Ocean: 36,740 feet (11022 m)
• Highest Temperature Recorded	: 135.80F - A1 Aziziyah, Libya, Sep. 13,1922 (57.7°C)
• Lowest Temperature Recorded	: –128.5°F - Vostok, Antarction. July 21, 1983 (–89.2°C)
• Water Vs Land	: 4.5 to 4.6 billion years
• Atmosphere content	: 78% nitrogen, 21% oxygen and 1% traces of argon, carbon dioxide and water.
• Rotation on Axis	: 23 hours and 56 minutes and 04.09053 second. But, it takes an additional four minutes forthe earth to revolve to the some position as the day before relative to the sun (i.e., 24 hours)
• Revolution Around Sun	: 365 . 2425 day
• Chemical Composition of the Earth	: 34.6% Iron, 29.5% Oxygen, 15.2% Silicon, 12.7%, Magnesium, 2.4% Nickel, 1.9% Suffer and 0.05% Titanium.

Cosmic World

Moon: 176

There are 181 known natural moons orbiting planets in our Solar System. 173 moons orbit the "full-size" planets, while 8 moons orbit the smaller "dwarf planets".

Asteroid: 645,118

A small rocky body orbiting the sun is termed as asteroid. Large numbers of these, ranging enormously in size, are found between the orbits of Mars and Jupiter, though some have more eccentric orbits. The asteroid is categorized by their spectra, with most falling into three basic groups: carbonaceous (C-type), silicate (S-type), and metal-rich (M-type).

Meteor: A meteoroid is a small rocky or metallic body travelling through space and range in size from small grains to 1 meter-wide objects.

When it enters the atmosphere to become visible is called as a meteor. It is also known as "**shooting star"** or **"falling star."** One can see nearly 20 million of meteors in a day. On an average nearly each day nearly one to two reaches Earth. In Huba the largest meteorite was found (Namibia – 60 tons).

The rings of Saturn are made up of countless small particles, ranging in size from micrometres to metres and orbit about Saturn. They are most extensive planetary ring system of any planet in the Solar System. The ring particles are made almost entirely of water ice, with a trace component of rocky material. There is still no consensus as to their mechanism of formation; some features of the rings suggest a relatively recent origin, but theoretical models indicate they are likely to have formed early in the Solar System's history.

A dwarf planet is a planetary-mass object that is neither a planet nor a natural satellite. It orbits the Sun, and is massive enough for its shape to be in hydrostatic equilibrium under its own gravity, but has not cleared the neighborhood around its orbit. The term dwarf planet was adopted in 2006. Currently, the International Astronomical Union (IAU) recognizes five dwarf planets: Ceres, Pluto, Haumea, Makemake, Seden and Eris.

Pluto as dwarf planet

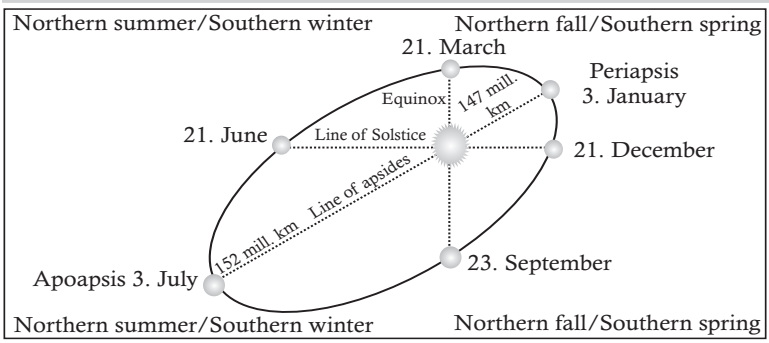
Pluto is called a "dwarf planet." A dwarf planet orbits the sun just like other planets, but it is smaller. A dwarf planet is so small it cannot clear other objects out of its path. Similarly, Pluto is in a region called the Kuiper (KY-per) Belt. Thousands of small, icy objects like Pluto are in the Kuiper Belt. The orbit of which Pluto follows takes 248 days to revolve round the sun once and it oval in nature. There are moments when it is nearest to the sun causing the ice present on the planet to melts. Pluto having about one-fifteenth the gravity of Earth, its atmospheres altitude rises more than any other planet.

Oort Clouds: roughly spherical, shell of icy found in the outermost reaches of the solar system is called as Oort Clouds. Astronomers believe that it is remains of the disc of material that formed the Sun and planets. Estimates put it at around 2 trillion. It is also referred to as Trans-Neptunian object applied to objects in the Kuiper Belt. Astronomers think that long-period comets have their origins in the Oort Clouds.

Seasons Formation

Revolution of the Earth around the Sun along with its spins around its axis, which is tilted at an angle of 23.5 degrees, is the main cause of season's formation. Around the June Solstice, the Northern Hemisphere is tilted towards the Sun, therefore experiencing summer. The Southern Hemisphere on the other hand, is tilted away from the Sun and thus, experiences winter. The opposite occurs around the December Solstice, when the Southern Hemisphere is tilted towards the Sun, while the Northern Hemisphere is tilted away.

Seasons and their Formation



There are **four seasons**: Summer when the Sun's ray falls directly over the tropic of cancer. In autumn the Sun's ray falls directly over the equator. During winter it is over tropic of Capricorn and during spring it falls back on equator.

Equinoxes are the days and nights are equal. The sun's ray falls directly over equator. March 21 is called as Vernal equinox and 23rd September is autumnal equinox. In the same ways **Solstice** occurs when the difference between the lengths of day and night are maximum. Occurs twice in a year firstly when the sun's ray falls tropic of cancer and secondly when over tropic of Capricorn.

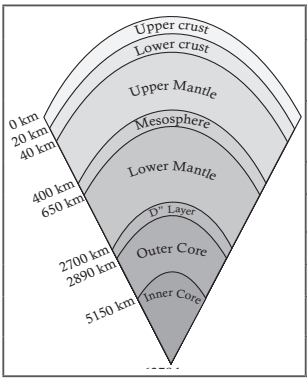
An eclipse is a natural phenomenon. **Eclipse** is related to obscuring light of the sun or the moon by any other body. There are two types of eclipse. **Lunar eclipse** occurs when the earth comes in middle of the sun and the moon. It occurs on full moon day but not every full moon day experiences lunar eclipse. Solar eclipse occurs when the moon comes in middle of the sun and the earth. it occurs on the new moon day when the moon is in line with sun.

Chronological age of the Earth

EON	ERA	PERIOD		EPOCH	Millions of Years Ago
Phanerozoic	Cenozoic	Quaternary		Holocene	0.011477
				Pleistocene	1.806
		Tertiary	Neogene	Pliocene	5.332
				Miocene	23.03
			Paleogene	Oligocene	33.9
				Eocene	55.8
				Paleocene	65.5
	Mesozoic	Cretaceous			145.5
		Jurassic			199.5
		Triassic			251
	Paleozoic	Permian			299
		Charboniferous	Pennsylvanian		318.1
			Mississippian		359.2
		Devonian			416
		Silurian			443.7
		Ordiviclan			488.3
		Cambrian			542
Precambrian	Proterozoic: Neoproterozoic	Ediacaran			630
		Cryogenian			850
		Tonian			1000
	Proterozoic: Mesoproterozoic	Stenian			1200
		Ectasian			1400
		Calymmian			1600
	Proterozoic: Paleoproterozoic	Statherian			1800
		Orosirian			2050
		Rhyacian			2300
		Siderian			2500
	Archean: Neoarchean				2800
	Archean: Mesoarchean				3200
	Archean: Paleoarchean				3600
	Archean: Eoarchean				4000
	Hadean				4567

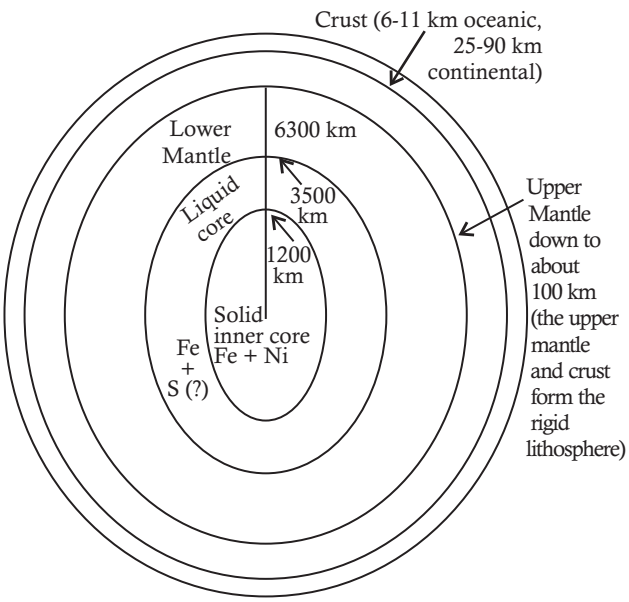
Internal Structure

The thickness and deepness of the earth is the study of seismology. The interior structure of the Earth is layered in spherical shells. It was Edmund Halley (1692) who put forth the idea of earth consisting of a hollow shell about 500 miles thick, with two inner concentric shells around an innermost core. These shells can be divided by mechanical properties such as Rheology, or chemically. Mechanically, are divided into lithosphere, asthenosphere, mesospheric mantle, outer core, and the inner core. The interior of Earth is divided into 5 important layers. Chemically, are divided into the crust, upper mantle, lower mantle, outer core, and inner core.



Depth (Km)	Layers
0-60	Lithosphere (locally varies between 5 and 200 km) (density 2.9-3.3)
0-35	Crust (locally varies between 5 and 70 km)
35-60	Uppermost part of mantle
35–2,890	Mantle
100–200	Upper mesosphere (density 3.3-4.3)
660–2,890	Lower mesosphere (density 4.3-5.5)
2,890–5,150	Outer core (density 10.00-13.3)
5,150–6,360	Inner core (density 13.3-13.6)

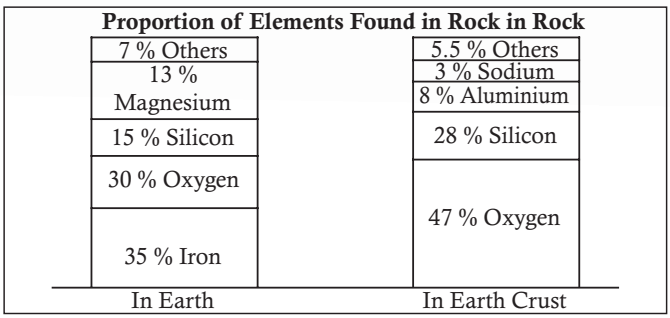
INTERIOR THE EARTH



GEOMORPHOLOGY

Rock

Rock is a naturally occurring mineral and relatively hard.

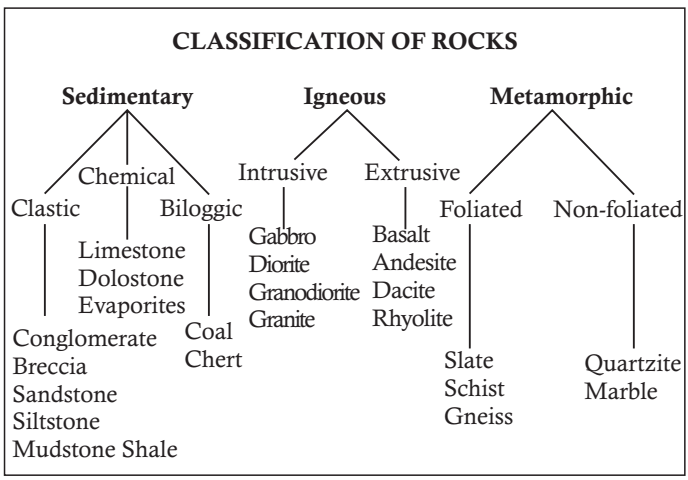


Type of Rocks

Sedimentary Rocks : Sedimentary rocks are formed through lithification, compression and cementation of sediments deposited in a particular place mainly aquatic areas.

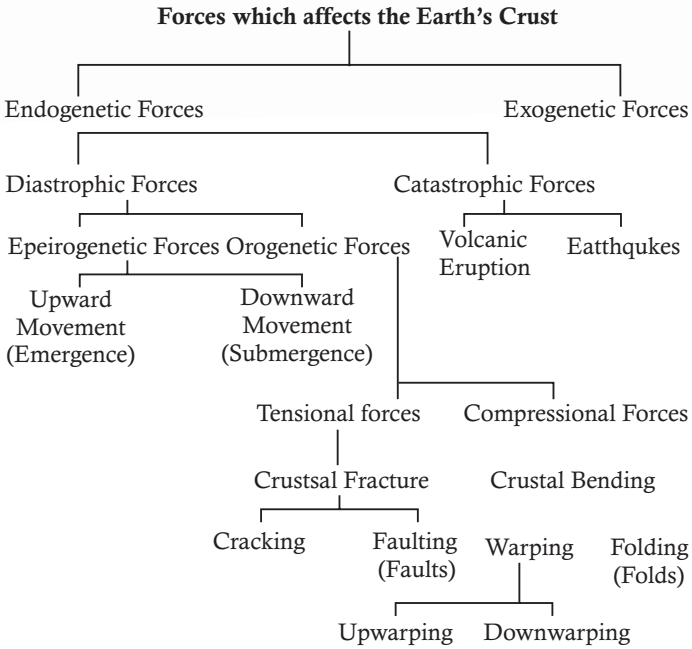
Igneous / Primary Rocks : Igneous rocks are formed from solidification and cooling of magma. Usually this magma is partial melts of pre-existing rocks derived from mantle or crust of the earth. This melting of rocks is caused by one or more processes namely: increase in temperature, decrease in pressure, or a change in composition e.g. Basalt, Granite.

Metamorphic Rocks : When the change occurs in the form or composition of the pre-existing rock (igneous or sedimentary) without any disintegration taking place is called as metamorphic rock.



Earth Movement

The forces affecting earth's crust and the resultant movement can be categorized into two broad categories and further into sub-categories. The fig given below demonstrates different types of earth movement.



Endogenetic Forces

The forces which originate within the Earth surface are defined as endogenetic forces. They can result in both horizontal and vertical movement of the earth surface. Internal heat causing chemical reactions inside the earth and transfer of rock materials on the surface of the earth by external forces results in release of endogenetic energy.

Endogenetic forces are of two types: **Diastrophic movements** and **Sudden movements**.

Sudden movement causes fold, fault, earthquake and volcanic activities.

Folds are the wave like structure formed in the crustal rock due to tangential compressive force resulting from horizontal movement caused by endogenetic forces.

Types of Folds

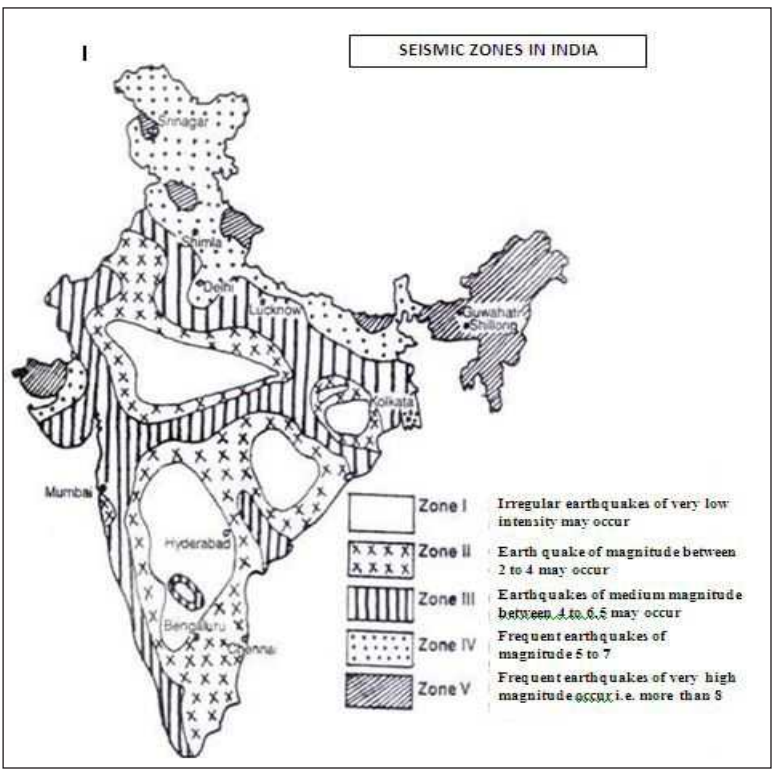
- **Symmetrical fold** is the simple fold, the limbs of which incline uniformly.
- **Asymmetrical Fold** is the folds with unequal and irregular inclination and length.
- **Monoclinal Fold** is the folds with one limb inclined moderately with regular slope while the other limb inclines steeply at right angle and the slope is almost vertical.

- **Isoclinical Fold** is a fold where compressive force, forces both the limbs of the fold to become parallel but not horizontal to its axis.
- **Recumbent Fold** is formed when compression force is strong enough to make both the limbs of the fold parallel as well as horizontal to its axis.
- **Faults** are the slippage or displacement occuring in the crust along the fracture plane. Four types of faults: i) normal, ii) reverse, iii) lateral and iv) step faults.
- **Volcano** is a fissure or vent in the earth's crust communicating with the interior, from which flows of lava, rock fragments, hot vapor and gases are ejected. A volcano begins to form when magma, which is hot molten rock from deep within the earth, rises toward the earth's surface and collects in magma chambers.



Types of Volcanoes:

(a) Active Volcanoes: Alive now
(b) Dormant Volcanoes: have not erupted for quite some time
(c) Extinct Volcanoes: have not erupted for several centuries



- **Earthquake** Motion ranging from faint terror to wild shaking of the earth surface is called as earthquake. It occurs mainly due to tectonic activities caused by continuous endogenetic processes inside earth's crust. The place from where it starts is called as focus or hypocenter and the point directly above it is known as epicenter. It is measured in Richter scale varying from 0 to 9. There are five Seismic Zone in India.
- **Primary Wave (P)** is a wave which travels both through solid and liquid part of the earth interior.
- **Secondary Wave (S)** is a wave which travels only through the solid the earth interior.
- **Long Wave (L)** is a wave confined to the earth crust, causing structural damage only.

Plate Tectonic Theory: Our earth surface is made up of plates which are in motion due to the convection current flowing beneath it. This movement in the earth's plate is called as tectonic movement. This movement has been widely accepted cause of continental drift, earthquakes, volcanoes, mountains, and oceanic trenches. There are three type major types of plates

(i) Constructive Plates is a place of divergent boundary where two plates slide apart from each other. Here seafloor spreading occurs i.e. new plates are formed.

(ii) Destructive Plates is a convergent boundary where two (or more) tectonic plates move toward one another and collide. E.g. The east coast of Pacific Ocean near South America.

(iii) Conservative/ Transform Plates occur where two lithospheric plates slide and grind past each other along faults. Here plates are neither created nor destroyed.

Types of Plates	
Minor Plates	**Minor Plates**
Africa Plate	Cocos Plate
Pacific Plate	Filipino Plate
North American Plate	Juan de Fuca Plate
Antarctic Plate	Caribbean Plate
Eurasian Plate	Scotia Plate
Australian Plate	Nazca Plate
South American Plate and	Arabian Plate
Indian Plant	

Exogenetic/Denudational/ Destructional Forces

The forces which act above the earth surface changing relief of earth surface are known as exogenetic forces. These processes are continuously engaged in destructing the relief features created by endogenetic forces. These forces are carried on by the agents of erosion such as wind, water, glacier etc. the process through which these agent work of the earth surface are **weathering and erosion**.

- **Weathering** is a process in which breaking down of the earth surface takes place but the debris do not move from their place.
- **Erosion** refers to the movement in the weathered material

Denudation is a long-term sum of processes that cause by weathering leading to a reduction in elevation and relief of landforms and landscapes and erosion.

Major Land Forms

Mountains are the second order relief features having an abrupt natural rise from the adjacent surrounding area. Collective system of long, narrow elevated land for some distance is a **Mountain Ridge**. Several parallel long narrow mountains of different period is called as **Mountain chain**. **Mountain Range** is a series of mountain ridges, peaks, and summits and the valley of same age but structurally different. **Cordilleras** are the huge set of several mountain groups and systems having different ridges, ranges, mountain chains etc.

Types of Mountain :

- **Folded Mountains** are originated by compressive forces. Young, mature and old are its sub types. Its e.g. Alps in Europe, Rockies in north America, Andes in South America and the Himalayas in Asia.
- **Block fault Mountain** are originated by tensile and comperessional forces. E.g. Black forest mountains on the boader of France and Germany.
- **Dome Mountain** are originated by magnetic intrusion and unwraping of the crustal surface.
- **Volcanic Mountain** formed by accumution ofvolcanic materials e.g. Mount Mauna Loa in Hwaai, Mt,Fuji Yoma in Japan and Mt. Popa in Central Myanmar.
- **Residual mountain** e.g. Vindhyacha, Aravalli, Eastern and Western Ghats**.**

Plateau

A second order relief feature characterized by flat and rough top surface and steep wall with a height difference of at least 300 m from it surrounding areas.

Type of Plateau:

(i) Intermontane Plateau (Tibetan, Bolivian, Peru, Columbian Plateau, Mexiacan, Iranian)
(ii) Piedmont Plateau (Appalachian Piedmont Plateau. Patagonian Plateau)
(iii) Continental Plateau (Deccan Plateau of India, Ranchi, Shillong)
(iv) Coastal Plateau (Coromandal Coastal upland of India)

Lake

Lakes are static bodies of water surrounded by land from all sides. These are not permanent features on the earth surface. Sometimes lakes are found near along the sea coast. There are two type lakes e.g. freshwater lakes and saline lake.

OCEANOGRAPHY

Ocean Structure

- Ocean can be divided into two main groups (i) the ocean (ii) the sea. Covers 70 per cent of the earth surface and has an average depth of more than 12,400 feet
- Geographically ocean has been divided into (i) the Pacific (ii) the Atlantic (iii) the Indian (iv) the Arctic.
- Pacific Ocean the largest and oldest occupies 50% of the ocean would, followed by Atlantic (29.9%), Indian (21%).
- Arctic is strictly not an ocean and not navigable.
- The longest mountain range in the world is under water "Mid-Oceanic Ridge".

Continental shelf

- Continental margin submerged under ocean water upto 100 fathoms (600 feet) with slope of

1° to 3° and often determined by the coastal reliefs. High mountainous coast have narrow self. In Atlantic Ocean it is 2 km to 80 km.

- They are rich in plankton, it forms food for fish. Thus they are rich source of fish like Grand Bank of New Foundland, North Sea and Sunda Shelf.

Continental slope

- Steep slope, beyond continental slope towards ocean are called as continental self. Its slope varies from 2° to 5° and depth of water is 200 m to 2,000 m. Occupies 8.5% of the total area of ocean basin. Due to erosion, tectonic and aggradations

Deep Sea Plain / Abyssal Plain

- Most extensive relief, covering 75.9% of the total area of ocean basin. Flat and rolling submarine having depth from 3000 m to 6000 m. The greatest Deep in Mariana Trench near Guam Island is the deepest of all.

Submarine Canyons

- Long, narrow and very deep valley or trenches, located on the continent shelves and slope with vertical walls
- The continental shelf in Pacific Ocean varies between 160 km to 1600 km of width on an average there it 80 km wide.
- On an average Indian ocean's continental shelf is 640 km wide in the west and in the east near Java and Sumatra is as narrow as 160 km and further narrower along the coast of Antarctica

Temperature of Ocean

- Ocean is divided into three layers according to temperature.

(i) First layer upto 500 m from top having temperature of 20° - 25°C

(ii) Thermocline layer - below 500 m where temperature decreases at a rapid rate with the increase in depth.

(iii) Third layer very cold and extend upto deep ocean floor. Polar region has only this layer from surface to deep ocean form.

Daily Range of temperature is the difference of maximum and minimum temperature of a day which is 0.3°C Low latitude and 0.2° to 0.3°C at higher latitudes.

Annual Range of temperature: Maximum temperature is recorded in August and minimum in February in northern hemisphere. Average annual range of temperature of ocean water is - 12°C usually.

Factors affecting distribution of temperature

- Minor factors include: Latitude, Unequal distribution of land and sea, Prevailing wind and Ocean current
- Minor factors include: Submarine ridges, local weather, location and shape of sea.

Horizontal distribution: average temperature 26.7°C and gradual decrease from equator towards poles, 0.5° F per latitude.

Vertical Distribution: Solar energy effectively penetrates 20m and nearby reach beyond 200 m depth.

Increase in depth decrease the temperature. And there is rapid fall in temperature upto 200 m dividing Ocean into two layers

(i) Photic/ Euphotic zone is the upper surface upto the depth of 200 m and receive solar radiation.

(ii) Alphatic zone goes beyond 200 m depth to the bottom and receive no solar rays.

Density of Ocean

- Amount of mass upper unit volume of substance, measured in g/cm^3
- Density of pure water is 1 g/cm^3 at 4°C. and of ocean water is 1.0278 g/cm^3 (2-3% higher than water) at 4°C.
- It increases with lowering of temperature of ocean. Highest density is recorded at -1.3°C.

Density stratification of Ocean

Three layered structure: Surface layer, Pychocline layer and Deep layer

Salinity of the Ocean

- Average salinity of ocean water is 35%. Salinity of ocean water is affected by marine organism, plant community and physical properties of ocean such as temperature density, waves, pressure and currents.
- Highest salinity is observed between 20° - 40° N (36%).
- Boiling point of saline water is higher than pure water.
- The line with same salinity is joined by Isohalines.

Source of Salinity

Salts brought by rivers is the main source It contains 60% of calcium sulphate, 2% of sodium chloride

Distribution of Salinity

Latitudinal zones	salinity (%)	Latitudinal zones	Salinity (%)
70°- 70° N	30-31	10°- 30° S	35-36
50°- 40° N	33-34	30°- 50° S	34-35
40°- 15° N	35-36	50°- 70° S	33-34
15°- 10° N	34.5-35		

Ocean Deposits

One the bases of origin can be classified into the following groups: Terrigenous deposits, (ii) Volcanic deposits, (iii) Biotic matter and deposits (iv) Abiotic matter and deposit

Coral Reefs and Atoll

It is accumulated and compact skeleton of lime secreting organisms known as coral polyps. They are confined between 25°N - 25°S latitude. They live on lime and in colony form. High mean annual temperature between 68°F to 70°F (20°C - 21°C) is required for the growth of corals. They do not grow in more than 250 feet (60-77 m) of water as they require oxygen and sunlight. Grow in open sea as fresh water is harmful for corals

Types of Coral Reef: (i) fringing reef (ii) barren reef and (iii) atoll

- Average salinity of the sea water : 35%
- Average salinity of Atlantic Ocean : 35.67%
- Maximum salinity of occurs between : 20° N and 40° Nand 10° S and 30°S
- Highest salinity is found : Lake Van (330%)
- Average temperature of Pacific Ocean : 19.10°C
- Average temperature of Indian Ocean : 17°C
- Average temperature of Atlantic Ocean : 16.91°C
- Average annual temperature of oceans : 17.2°C
- Average temperature of surface water : 26.7°C

Ocean Tide

- Alternative rise and fall in the sea level is known as tide. The rise of sea water and its movement towards coast is a tide is high tide. The fall of seawater and moving towards sea is called ebb/low tide. The difference between high and low is water is called as tidal range.
- The variation in the height of both low and high tide from place to place depends on depth of ocean water, configuration of sea coasts and coastlines and openness or closeness of the sea. Everyday tide is delayed by 26 minutes.

Types of Tide

(i) Spring tide: When the sun, the moon and the earth are n the same line, there is formation of spring tide. The position when all three are in a straight line is called as syzygy. When the sun, the moon and the earth are in sequential order in a straight line is called as conjunction. It occurs on new moon day. When the earth is in between the moon and the sun are called as opposition. It occurs on full moon day.

(ii) Neap tide: It's a quadrature (90^o) position between the earth, the sun and the moon on seventh or eighth day of the fortnight. During this time the forces of the sun and the moon acts in Opposite direction

Ocean Currents

The movement of a mass of ocean water parallel to the coast is called as ocean current.

Currents are of two types on the bases to temperature.

(i) Warm current and (ii) Cold current

On the bases of velocity, dimension and direction.

(i) Drift (ii) Current and (iii) Streams

Pacific Ocean

1. North Equatorial Current (Warm)
2. South Equatorial Current (Warm)
3. Counter Equatorial Current (Warm)
4. Kuroshio System (warm)
   (i) Kuroshio Current
   (iii) North Pacific Drift
   (iv) Tsushima Current
   (v) Counter Kuroshio Current
5. Oyashio Current (Cold)
6. California Current (Cold)
7. Peur Current (Cold)
8. El Nino or Counter Current (warm)
9. Eastern Australian Current (warm)
10. West Wind Drift (Cold)

Origin of Currents

Origin of ocean current occurs due to following factors

(i) Rotation of earth
(ii) Temperature difference in ocean
(iii) Salinity difference in ocean
(iv) Density Difference
(v) Air pressure and wind
(vi) Rainfall and Evaporation
(vii) Direction, shape and configuration of coast
(viii) Bottom relief
(ix) Seasonal variation

Atlantic Ocean

1. North Equatorial Current (warm)
2. South Equatorial Current (warm)
3. Counter Equatorial Current (warm)
4. Gulf stream (warm)
   1. Gulf stream
   2. Gulf stream
   3. North Atlantic Current
5. Conary Current (Cold)

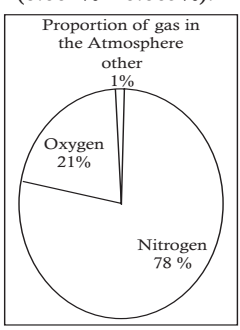
6. Labraclor Current (Cold)
7. Brazil Current (Cold)
8. Talk land Current (Cold)
9. South Atlantic Drift (Cold)
10. Benguela Current (Cold)

Name	Length (square miles)
Pacific Ocean	64,196,000
Atlantic Ocean	33,400,000
Indian Ocean	28,400,000
Southern Ocean	20,327,000
Arctic Ocean	5,100,000
Arabian Sea	1,491,000
South China Sea	1,148,000
Caribbean Sea	971,000
Mediterranean Sea	969,000
Bering Sea	873,000

ATMOSPHERE

The gaseous envelop which covers a celestial body or planet is called as its atmosphere. Air is a mixture of gases in various proportions. It has a mass of 5.15 × 1018 kg. ¾ of which are concentrated within 11 km of the surface of the earth. The gravity plays a vital role in holding the atmosphere close to the earth.

Gases which contributes to the formation of atmosphere are Nitrogen (78.084%) Oxygen (20.946%), Argon (0.93%), Carbon dioxide (0.0397), Neon (0.001818), Helium (0.000024), Methane (0.000179) along with water vapour (0.001% – 0.005%).



Structure of Atmosphere

Troposphere

The first layer of atmosphere from the earth surface is known as troposphere. It is at the height of 12 km from the earth surface, generally associated with 90 % atmospheric phenomena. Here temperature decreases at the rate of 6.5°C per km with the increase in height. This is called normal lapse rate. The transition layer separating troposphere from stratosphere is known as tropopause which is between 16 km at equator to 8 km at pole.

Stratosphere

The layer which extends from 18 to 50 km above the earth surface is called as stratosphere. In this layer temperature increases as altitude increases as the ultra violet ray by ozone. Ozone forms to be the outer limit for this layer. Turbulence free zone hence is ideal for flying of jet air crafts.

Mesosphere

Mesosphere lies from 50 to 80 km above the ground level with the temperature below – 100°C at 80 km. Even pressure drops to 1 mb at 50 km to 0.01 mb at 90 km. Mesopause are the upper transitional layer separating mesosphere from ionosphere. It is the zone of meteorites activities.

Ionosphere

The layer between mesosphere and thermosphere is known as ionosphere. Aurora Austrialis and Aurora Borealis occur due to

penetration of ionizing particles in this layer. Temperatures rise with increasing height here owing to the absorption of ultra-violet radiation by atomic oxygen. Above 100 km the atmosphere is increasingly affected by solar X-rays and ultra-violet radiation, which causes ionization.

Thermosphere

The thermosphere is the second highest layer of earth's atmosphere just above mesopause. It forms lower boundary of exosphere is known as exobase. Gradual increase of temperature is witnessed with height reaching up to 1500°C (2700°F).

Exoshpere

Outer most layer extending between of 700 km to 10000 km. Gases like nitrogen, oxygen and carbon dioxide are found. No meteorological phenomenon is possible. Sometimes Aurora Borialis and Aurora Austrialis occur overlapping into the thermosphere.

Insolation

- The sun is primary source of energy on earth. It enters earth's atmosphere in the form of short waves. This is known as insolation. The earth receives solar radiation at the rate of 1.94 calories per cm^2/m.
- The amount of solar radiation received by earth is affected by four factors which are as follows:

1. Solar Constant: is rate at which incoming solar radiation is received per unit area of earth surface when the sun is at its mean distance from the earth. Increase in the sun-spot increases the amount of solar radiation hence affecting insolation as well.

2. Distance from Sun: The path that is followed by the earth around the sun is not at the same distance throughout the year. The orbit of the earth is elliptical in shape. The shortest distance of the earth from the sun is called as Perihelion (147 million km) and Apehelion is time when the earth farthest from the sun. The former occurs in January and the latter in July.

3. Altitude of the Sun: Solar altitude is this relative angle of the sun with respect to earth's horizon. The angle formed between the sun and the earth surface varies with the latitude at which a place is situated. The area closer to equators receive greater amount of solar insolation than at poles.

4. Length of Day: the amount of insolation received by place also depends on the length the day. Longer the duration of the day more will be the amount of radiation received.

Heat Budget:

Earth balances the incoming solar radiation with the outgoing terrestrial radiation and is called as heat budget. The energy received if not returned back to the space in the form of long waves would increase the temperature of the earth surface. This balancing of heat affects the amount of insolation absorbed.

Adiabatic Changes

When the air parcel moving towards a low pressure zone without the exchange of heat with surrounding air. It increases volume and reduces the heat available per unit volume and hence temperature falls. Such a change of temperature, where neither addition nor subtraction of heat involves is known as 'adiabatic change'.

Inversion of Temperatures

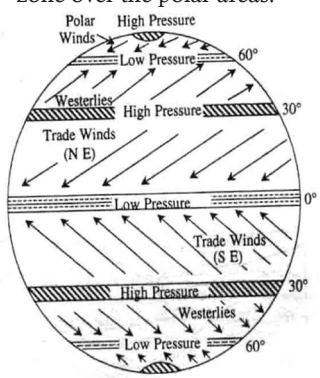
It refers to a condition where temperature increases with increasing height of the atmosphere. There five causes of inversion of temperature are radiation, drainage, frontal, advection, subsidence.

- General tendency to decrease in temperature with increasing latitude is known as **'temperature gradient'.** Not only the temperature but even its nature with latitude changes. The rate of change of temperature is comparatively low between tropics. On the other hand the gradient is high at the poles.

Isotherms : The line which joining places having equal temperature is called **'Isotherms'**.

Atmospheric Pressure

- Atmospheric pressure is the pressure exerted by the weight of air in the atmosphere of Earth. The standard air pressure at sea level is 1013.25 mb. Air pressure decreases with increase is altitude at the rate of 0.1 inch or 3.4 mb per 600 feet. The rate of decrease is confined to the height of few thousand feet. Line joining places with equal pressure at sea level are called isobars.
- The areas affect by high pressure are called as High Pressure zone or Anticyclones and the low pressure are called as Low or depression or Cyclone. There are seven pressure belts across the globes.
- **Equatorial Low Pressure Belt :** The region geographical situated between 5° N to 5°S is known as Equatorial Low Pressure Belt. This belt gets longer duration of sunshine and sun's ray falls at a straight angle on earth surface. Intense heat is received by the earth surface causing thermal induced atmosphere. It is also a convergences zone of north-east and south-east trade winds. The area is calm with no wind movement thus known as Belt of Calm or Doldrums.
- **Sub-Tropical High Pressure:** The sub tropical high pressure belt extends between 25° to 35° in both the hemisphere. The air upraises in equatorial region. They start descending as they become heavy after cooling at a certain height and are deflected towards poles because of earth's rotation causing a zone of high pressure.
- **Sub Polar Low Pressure Belt:** The zone is situated between 60° to 65° in both the hemisphere. The temperature of this area is generally low throughout the year. It is a convergence zone where winds from sub-tropical low and polar high meets together to produce Polar front.
- **Polar High:** The Polar High Pressure zone is situated near the pole. As the name suggests the zone is originated due to thermally induced factor as very low temperature is solely responsible for the creation of a high pressure zone over the polar areas.



Major Pressure

Wind Belts

Wind can be defined as the movement large volume of gases from high pressure area to low pressure area. There are two types of winds 1) Permanent/ Prevailing Winds (blow throughout the year) and 2) Seasonal Wind (blow in particular period of the year)

Permanent/ Planetary/Prevailing Winds

Types	Sub Types	Characteristics
Tropical Winds	**Doldrum (5^0 N - 5^0 S) Equatorial westerlies (15^0N – 35^0N)**	• It is called as "equatorial calms" because wind over there has no motion and cumulonimbus cloud are formed bring daily rainfall. • It is not continues belt. Equatorial fronts are formed and equatorial westerlies blow there. It is associated with strong atmospheric disturbances or cyclonic storm.
	Trade Winds	• A wind flowing from subtropical high pressure to equatorial low pressure belt is termed as Trade Winds. It moves in north east and south east in north and south hemisphere respectively.
Sub Tropical wind	**Westerlies (35^0-65^0N and S)**	Blowing from subtropical high pressure belt **(30^0 -35^0 N and S)** to the sub polar low pressure belt **(60^0 -65^0 N and S)** is called Westerlies. In the northern hemisphere these wind blow from south west to north east and in southern hemisphere from north west to south east. **40^0S to 50^0S-Roaring Forties**, **50^0S to 60^0S- Furious Fifties** and **60^0S onwards – Shriecking Sixties** are its name.
Polar Wind		• A low pressure zone is created in between 600 to 650 in both the hemisphere due to the dynamic factor of the earth. • It blows from north easterly and south easterlies in northern and southern hemisphere respectively.

Variable Wind

Sub Types	Seasonal Winds Characteristics
Monsoon	• It blows from the south west in summer and from north east in winter. It is consistent and bi-directional regular flow of wind over a year. It is thermally induced complex air circulation where all layers of air circulation that is surface, middle and upper layer are involve.
Local Winds	
Sea Breeze and Land Breeze	• During the day time land is heated quickly than the sea water. Low pressure is created over the land and wind rise up creating vacuum over land. Thus the wind from sea rushes to take its place. This breeze is called as Sea Breeze.

	• It blows during night as the land losses the heat faster than the sea, this cool and denser wind rushes towards sea. This breeze is called as land breeze.
Valley and Mountain Breeze	• During day time sunlight warms the mountain slope more than mountain valley. Thus a high pressure is created on the top of mountain. The cold wind from the valley rushes up. This movement of air is called as valley breeze giving precipitation through cumulus cloud. • After sunset the air above the mountain cools faster due to density than the air in the valley and descends down into the valley is called as mountain breeze causing inversion of temperature.
Chinook and Foehn	It blowing on the leeward side of the mountain in USA and is called as Foehn in Switzerland. It's a warm air (4.40 C) and melts snow (Snow Eater).
Harmattan	This is a warm and dry wind blows from north to east and east to west over Sahara desert. Harmattan is known to be the Doctor in Guinea Coastal Area of western Africa.
Sirocco	A warm, dry and dusty wind blows in the north easterly direction from Sahara Desert. As it crosses Mediterranean picks up water vapour and yield rainfall southern part of Italy. It is called as "blood rain" rain fall laden with red sand from Africa Desert.
Mistral	Mistral is a cold local wind blowing over Spain and France in north-west to south-east direction during winters creates high pressure over Europe and low pressure over Mediterranean Sea. It average velocity is 56-64 km/hour.
Bora	Extremely cold and dry north-easterly wind blows along the coast of Adriatic Sea. The velocity of the wind ranges between 128 to 196 km/hr
Blizzard	It is a violent stormy wind that carries large amount of dry snow, mainly prevalent over both north and south poles. Its velocity ranges from 80-96km an hour.
Abrolhos squall	An Abrolhos squall blow from May through August (austral winter) near the Abrolhos Islands off the coast of eastern Brazil near 18°S latitude.
Pampero	The pampero is a burst of cold polar air from the west, southwest or south on the pampas in the south of Brazil, Argentina and Uruguay. It is common during winter in the southern hemisphere (principally between May and August).
Maestral or maestro	Maestral or maestro is mostly northwestern wind in the Adriatic Sea blowing in summer characteristic for beautiful and stable weather

Levante	It blows in western Mediterranean, near to the Strait of Gibraltar. It is called as the Viento de Levante or the Levanter and even Solano. It blows moderately or strongly bringing rain and damp smell to the region.
Norte	The Norte is a strong cold northeasterly wind which blows in Mexico along the Gulf of Mexico. It results from an outbreak of cold air from the north.
Etesian	Etesians blow as winds of northeasterly to northerly direction over Northern Agean Sea while, in the southern Aegean along with the Cretan and the Carpathian Sea, they blow as northern westerlies.
Helm	Generally seen in Columbia and England these strong north-easterly wind blows down the south –west slope of the Cross Fell Escarpment
Buran/ Purga	Extremely cold wind full of ice and snow blowing across Russia and eastern Asia. In tundra region, it is also known as Purga. In Alaska this severe north-easterly wind is known as Burga bringing snow and ice pellets.
Brickfielder	It is a hot and dry summer wind blowing in coastal regions of South Australian desert. Blows strongly, for several days at a time, along with dust, and parching all vegetation. In one sense it is a healthy wind, as it destroys many injurious germs due to its hotness.

Air Mass

A large volume of air defined by constant physical properties i.e. temperature and water vapor, spreading over hundreds or thousands of square miles is called as air mass.

Types of Air mass
Continental Polar (cP) forms over cold and dry land mass during winter near poles north of 50-600N.
Maritime Polar (mP) is associated with cool or cold, damp and gray day's weather, near polar coastal areas.
Continental tropical (cT) form over deserts and plains. It is hot and dry during summer and only dry during winter.
Maritime Tropical (mT) is hot and humid sticky weather on the tropical coastal regions.

Cyclones

Cyclones are the low pressure centers surrounded by closed isobars having pressure increasing outwards. Blows inward from high pressure to low pressure and hence wind movement is anti-clockwise in northern hemisphere and clock wise in southern hemisphere. They are also termed as atmospheric disturbances. There shape varied from circular to elliptical and sometimes even V shaped. On basis of place of origin there are two types cyclones which are as follows:

Tropical Cyclone	Temperate / Extra-tropical cyclone
The tropical cyclones have a thermal origin, exclusively over the tropical seas.	Formed in middle or high latitudes, due to the development of front (350-650 N and S).
A low pressure zone is created due to extreme heat and further intensifies with the increase in temperature (above 270C) The winds from surrounding high pressure region rushes to the central low pressure (eye) area developing a powerful and destructive storm. The velocity of the cyclone varies from 32-180 km/hour.	Develops when a frontal surface separates two opposing air masses (warm and cold). As the amplitude of the wave increases, the pressure at the centre of disturbance falls, eventually intensifying to the point at which a cyclonic circulation begins.
Its velocity decreases and finally decays as they cross more land mass. Usually ends with heavy down pour rain and wind bringing devastation to the coastal areas.	When the cold air from the poles sweeps off all the warm tropical air and entire cyclone is composed of the cold air mass temperate cyclone dies.

Clouds

Clouds are the visible mass of condensed water vapour floating in the atmosphere, typically high above the general level of the ground. It plays a major role in the heat budget of the earth and the atmosphere as they reflect, absorb and diffuse the incoming short wave and outgoing long wave terrestrial radiation. According to the height there are three type of cloud such as (i)High Clouds (height 6 km to 20 km), (ii) Medium Clouds (height 2.5 km to 6 km) and (iii)Low Clouds (height ground surface to 2.5 km)

- A cloud is a mass of small water droplets or thin ice crystals.
- Different types of clouds are as follow:
- **Cirrus** : Feather like
- **Cirrocumulus** : Ripples like
- **Cirrostratus** : Transparent sheet like causes sun and moonto have 'halos'.
- **Altocumulus** : Have bumpy-look
- **Altostratus** : Sheet like
- **Stratocumulus** : Large globular masses
- **Nimbostratus** : Dark grey and rainy looking give continuous rain.
- **Stratus** : low clouds foggy in appearance
- **Cumulus** : Round topped and flat based
- **Cumulonimbus** : special type of cumulous clouds spread out in form of an anvil. Often indicate convectional rain,lightening and thunder.

Precipitations

It is a process in wherein water in the form of droplets which condenses from water vapor after reaching a height and falls when they become heavy enough in the form of rain. Rain is a major component of the water cycle and is responsible for depositing most of the fresh water on the Earth. Different forms of precipitation are rain, snowfall, hale storm and drizzle. Precipitation occurs through different processes which are **Convectional, Cyclonic and Orographic.**

INDIAN GEOGRAPHY–MIND MAP

India Physiography	• Himalayan Mountain Range • Indian Desert • Northen Plain • Coastal Plain • Peninsular Plateau • Island
Drainage	• Himalayan Rivers (The Indus, The Ganges & The Brahmaputra) • Peninsular Rivers (Mahanadi, Godavari, Krishna, Cauvery, Narmada, Tapi) • Lakes in India
Soil	• Alluvial • Red • Black • Laterite • Arid • Saline • Peaty and Marshy • Mountain and Forest
Climate	• Factors Affecting Climate in India • State wise Rainfall Distribution
Natural Vegetation	• Classification of Natural Vegetation • Spatial Distribution of Natural Vegetation in India
Language	• Languages spoken in different parts of India
Agriculture	• Major Crops • Land use Pattern • Agro-Climatic Zone • Major Growing Season and its Associated Crops
Industry	• Major Industrial Regions in of India • Types of Industry
Minerals	• Minerals & their distribution
Energy	• Conventional Energy • Hydroelectricity • Thermal Electricity • Wind Energy
Census 2011	• Population density and Sex Ratio • ST & SC Population • Rural Urban Distribution

INFORMATION BULLETIN

1. **Official name:** Republic of India
2. **Capital:** New Delhi
3. **Nationality:** Indian
4. **Continent:** Asia
5. **Region:** South Asia Indian subcontinent
6. **Area:** Ranked 7th
   - Total 3,287,263 km^2 (1,269,219 sq mi)
   - Land 90.08%
   - Water 9.92%
7. **Borders :** Total land borders : 15,106.70 km (9,386.87 mi)

- **Bangladesh :** 4,096.70 km (2,545.57 mi)
  Bordering States - West Bengal, Assam, Meghalaya, Tripura and Mizoram
- **China (PRC):** 3,488 km (2,167 mi)
  Bordering States - Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Sikkim, and Arunachal Pradesh)
- **Pakistan :** 2,910 km (1,808 mi)
  Bordering States- Jammu and Kashmir, Himachal Pradesh, Punjab, Rajasthan and Gujarat
- **Nepal :** 1,751 km (1,088 mi)
  Bordering States – Bihar, Uttarakhand, Uttar Pradesh, Sikkim, and West Bengal
- **Myanmar :** 1,643 km (1,021 mi)
  Bordering States – Manipur and Nagaland
- **Bhutan :** 699 km (434 mi)
  Bordering States : West Bengal, Sikkim, Arunachal Pradesh, Assam

8. **Highest point:** K2 or Godwin Austin (claimed) 8,611 m (28,251.3 ft)
9. Kangchenjunga (administered) 8,598 m (28,208.7 ft)
10. **Lowest point :** Kuttanad; –2.2 m (–7.2 ft)
11. **Longest river :** Ganges, Brahmaputra
12. **Largest lake :** Chilka Lake

MAJOR PHYSIOGRAPHIC DIVISONS

The landmass of India can be divided into following major physiographic divisions:

The Himalayan Mountains

The Himalayas are the youngest mountains in the world. They are structurally folded mountains, form an arc of about 2,400 km long from west to east. The width varies from 400 km in Kashmir to 150 km in Arunachal Pradesh. The altitudinal variations are greater in the eastern part than in the western part. There are four parallel ranges in its longitudinal extent. Zaskar range lies west of Himalayas and Indus gorge is beyond it.



- **The Great or Inner Himalayas:** Known as 'Himadri, it is the most continuous range with loftiest peaks. Average height of peaks here is 6,000 meters. Asymmetrical folds having granite in the core are snow covered throughout the year.
- **The Lesser Himalaya or Himachal**: This lies south of the Great Himalayas and north of Shiwalik with altitude varying from 3,700 m to 4,500 m. Average width of this range is 60-80 km. This range is mainly composed of highly compressed and altered rocks. Pir Panjal, Dhaula Dhar, Mahabharat and Mussorie ranges are found as we move west to east.
- **The Shiwaliks outer Himalayas:** It is an outermost range and is also known as lesser Himalayas. The altitude varies between 900 - 1100 km and the width varies between 10 -50 km in this range. The longitudinal valleys lying between the Himachal and Shiwaliks are called 'Dun' and are composed of unconsolidated sediments.
- **Trans Himalayas :** It includes Karakoram and Laddakh Ranges. Karakoram Range (Krishnagiri) lies north of Indus. Extended from Pamir crossing Gilgit river reaches Laddakh. Elevation is above 5500 m and width is 120-140 Km. Laddakh Range is situated in Kashmir between Indus and its tributary Shyok. Highest peak is Mt. Rakaposhi (7880).

MAJOR MOUNTAIN PEAKS OF INDIA

Peak	Country	Height in meters
Mt. Everest	Nepal	8848
Kanchenjunga	India	8598
Makalu	Nepal	8481
Dhaulagire	Nepal	8172
Nanga Parbat	India	8126
Annapurna	Nepal	8078
Nanda Devi	India	7817
Kamet	India	7756
Namcha Barwa	India	7756
Gurla Mandhata	Nepal	7728

The Northern Plain

The northern plain of India is formed by three river systems, viz. the Indus, the Ganga and the Brahmaputra along with their tributaries. Alluvial soil has been deposited over millions of years. The total area of the northern plain is about 7 lakh square kilometer. It is about 2400 km long and about 240 to 320 km broad. The northern plain is divided into three sections, viz. the Punjab Plain, the Ganga Plain and the Brahmaputra Plain.

- **Punjab Plains:** western part most part of the northern plain. Formed by the Indus and its tributaries like Jhelum, Chenab, Ravi, Beas and Sutlej.
- **Ganga Plains:** This plain extends between Ghaggar and Tista rivers. The northern states, Haryana, Delhi, UP, Bihar, part of Jharkhand and West Bengal lie in the Ganga plains.
- **Brahmaputra Plains:** This plain forms the eastern part of the northern plain and lies in Assam.

- Based on the relief features the northern plain can be divided into four regions, viz. bhabar, terai, bhangar and khadar.

The Peninsular Plateau

The peninsular plateau is a tableland. It is composed of the oldest rocks and drifted from Gondwana land with elevation of 600-900 Km. Broad and shallow valleys with rounded hills are the characteristic features of this plateau. The plateau can be broadly divided into two regions, viz. the Central Highlands and the Deccan Plateau. The slope of the Deccan Plateau is from west to east as the rivers flows.

- **The Central Highlands:** lies to the north of Narmada river (Satpura range), covering portion of Malwa plateau. It is wider in west and narrower in east. Bundelkhand and Baghelkhand mark the eastward extension. The plateau further extends eastwards into the Chhotanagpur plateau. Touches Aravilli in the west covering Rajasthan uplands.
- **The Deccan Plateau:** Triangular in shape, Satpura range makes its northern boundary. The Mahadev, Kaimur Hills and Maikal ranges make its eastern part. It extends into the north east which encompasses Meghalaya, Karbi-Anglong Plateau and North Cachar Hills. Garo, Khasi and Jaintia hills are the prominent ranges starting from west to east.
- **The Western and the Eastern Ghats:** The average elevation of Western Ghats is 900 – 1600 metres compared to 600 metres in case of Eastern Ghats. The Eastern Ghats stretch from Mahanadi Valley to the Nilgiris in the south.

The Indian Desert

It lies towards the western margins of the Aravali Hills. This region gets scanty rainfall which is less than 150 mm in a year. Hence the climate is arid and vegetation is scanty.

The Coastal Plains

Towards the west and east of Peninsular stretches narrow coastal strips are situated. They run along the Arabian Sea in west and along the Bay of Bengal in east. The western coast lies between the Western Ghats and the Arabian Sea. It is divided into three sections. The Konkan is northern part, comprised of Mumbai and Goa. The Kannada Plain makes the central part and the Malabar coast is the southernmost coast. The eastern coastal plain is wider and runs along the Bay of Bengal.

The Islands

The Lakshadweep Islands are in the Arabian Sea. Its area is 32 sq km. This group of islands is rich in terms of biodiversity. The Andaman and Nicobar Islands group of islands can be divided into two groups. The Andaman is in the north and the Nicobar is in the south. These islands too have rich biodiversity.

ISLANDS OF INDIA



DRAINAGE IN INDIA

The pattern of Drainage in India is mostly influenced by its varied physiological divisions. Thus they are classified into three major types such as:

Himalayan Rivers

The Himalayan Rivers are mostly originated from Himalayan mountain range. These are mostly perennial in nature which means availability of water throughout the year as they obtain water from the large ice cover of great Himalayan range. Major rivers of this section are the Indus, the Ganges and the Brahmaputra. Other important tributaries of this section are Jhelum, Chenab, Ravi, Beas and Sutlej of Indus river system, Yamuna, Son, Ramganga, Ghaghara, Gantak, Kosi of the Ganges river System, and Tista, Lohit, Manas, Subansiri River, Dhansiri River of the Brahmaputra River System.



Peninsular Rivers

The Peninsular Rivers are mostly having their origin from Western Ghats running parallel with western coast from north to south. They are seasonal in nature as the source of water is rainfall only. The rivers form deltas at their mouth. Some of the rivers such as Mahanadi, Godavari, Krishna and Cauvery are drained into the Bay of Bengal where as the other prominent rivers like Narmada and Tapi both fall into the Arabian Sea.

Lakes

Lakes of India are of high importance as they prevent flooding during high rain and on the other hand it stimulate an even water flow during dry seasons. India is bestowed with some really beautiful lakes which are not only of geomorphologic importance but also attracts a large no of tourists every year. Many such lakes are Dal Lake,Wular, Chilka, Loktak, Nakki, Kodaikanal, Sukhna, Puskar, Nakki, Sukhna, Manasbal, Bhojtal, Hussain Sagar, Tam dil, Pulicat etc.

SOIL

As a prime natural resource soil plays an important role in the in the growth of human activities of a specific location. The type of soil found in India can be classified in number of ways but as per All India Soil Survey Committee of Indian Council of Agricultural Research there are 8 types of soil found in India.

Alluvial soil

- **Spatial Distribution:** wide spread in northern plains and river valleys such as Indus-Ganga-Brahmaputhra plain, Narmada-Tapi plain, deltas and estuaries of Peninsular India.
- **Property:** Mixture of Humus, lime and organic matters and hence highly fertile.
- **Colour:** Light Grey to Ash Grey.
- **Texture:** Sandy to silty loam or clay.
- **Suitable for:** Production of Wheat, rice, maize, sugarcane, pulses, oilseed.

Red soil

- **Spatial Distribution**: Mainly found in the areas of low rainfall. The states with red soils are Tamilnadu, Karnatake, South-east part of Maharashtra, Eastern Part of Andhra Pradesh and Madhya Pradesh, Chota Nagpur in Jharkhand, Orissa, Chhattishgarh Parts of South Bihar, Birbhum and Bankura districts of West Bengal, Mirzapur, Jhansi, Banda, Hamirpur district of UP, Aravali Hills and eastern half of Rajasthan.
- **Property:** Abundance of Ferric oxide Absence of lime matters and hence highly fertile.
- **Colour:** Red
- **Texture:** Sandy to clay and loamy.
- **Suitable for:** Production of Wheat, cotton, pulses, tobacco, oilseeds, potato.

Black / Regur soil

- **Spatial Distribution:** Most of the Deccan is occupied by Black soil.
- **Property:** Mature soil with high water retaining capacity, become sticky when wet and shrinks when dried. Iron, lime, calcium, potassium, aluminum and magnesium.
- **Colour:** Deep black to light black.
- **Texture:** Clayey.
- **Suitable for:** Best soil for cotton production.

Arid / Desert soil

- **Spatial Distribution:** Seen widely under Arid and Semi-Arid conditions such as Rajasthan, Parts of Haryana and Punjab.
- **Property:** Lack of moisture and Humus and contains impure Calcium Carbonate.
- **Colour:** Red to Brown.
- **Texture:** Sandy
- **Suitable for:** Salt tolerant crops like barley , rape, wheat , millet, maize.

Laterite soil

- **Spatial Distribution:** mostly found in Eastern Ghats, the Rajmahal Hills, Vidhyas, Satpura and Malwa Plateau.
- **Property:** Prone to leaching of lime and silica from soil, rich iron and aluminum,
- Deficient in Nitrogen, Potash, Potassium, Lime, Humus
- **Colour:** Red colour due to iron oxide

- **Texture:** Clayey rocky
- **Suitable for**: Rice, Ragi, Sugarcane and Cashew nuts are cultivated mainly.

Saline soil

- **Spatial Distribution:** mostly found Andhra Pradesh and Karnatak, in Drier parts of Bihar, Uttar Pradesh, Haryana, Punjab, Rajasthan and Maharashtra. In Gujrat the area around gulf of Khamart, vast estuaries of the Narmada, Tapi and Mahi river
- **Property:** mainly saline and alkaline in nature, rich in sodium, magnesium, and calcium salt, and sulphurous acid.
- Not Suitable for agricultural productivity.

Peaty/marshy soil

- **Spatial Distribution:** generally found Coastal areas of Orissa and Tamilnadu, Sunderbans of West Bengal, Bihar and Almora district of Uttaranchal
- **Property:** heavy and highly acidic in Nature, deficient in Potash and Phosphate.
- **Colour:** Black
- **Suitable for:** paddy Cultivation.

Forest soil and Mountain Soil

- **Spatial Distribution:** Mostly found in Himalayan Region mainly in valley basins, and Western and Eastern Ghats of Penninsular India
- **Property:** rich in humus, deficient in Potash, Phosphorous and lime.
- **Suitable for:** wheat, maize, barley in southern India and temperate fruit in Jammu & Kashmir, Himachal Pradesh and Uttaranchal

CLIMATE

Although India is basically a tropical country, it experiences wide variation in climatic condition depending upon the altitude, latitude, distance from sea and relief. The variability can be observed in number of factors such as:

- Western Rajasthan experiences a high temperature during June where as the areas close to Kashmir are relatively experiencing a much lower temperature. The coastal lands are comparatively having a moderate climate due to the nearness of sea.
- The amount of rainfall also varies throughout the country. The rainfall in India is primarily governed by Monsoon wind which which generally hits the south west coast of India generally in June and known as onset of Monsoon. The wind then starts circulating via the Bay of Bengal covering the entire eastern, north eastern and parts of central India. The highest rainfall is experienced in Mawsynram in Meghalaya i.e. 1221 cm of annual rainfall every year. On the other hand in the month of October and November the monsoon trough of Low pressure starts receding from Northern Plain results into rain in Southern India. About 50% to 60% of rainfall in Tamil Nadu is caused due to Retreat of Monsoon form North East.

Rain fall Distribution in India

Amount of Rain fall	Heavy Rainfall (> 200cm)	Moderately Heavy Rainfall (100-200 cm)	Less Rainfall (50-100 cm)	Scanty Rainfall <50cms
States	West coasts, on the western Ghats, Sub-Himalayan areas in North East and Meghalaya Hills. Assam, West Bengal, Southern slopes of eastern Himalayas.	Southern Parts of Gujarat, East Tamil Nadu, North-eastern Peninsular, Western Ghats, eastern Maharashtra, Madhya Pradesh, Orrisa, the middle Ganga valley.	Upper Ganga valley, eastern Rajasthan, Punjab, Southern Plateau of Karnataka, Andhra Pradessh and Tamil Nadu.	Northern part of Kashmir, Western Rajasthan, Punjab and Deccan Plateau

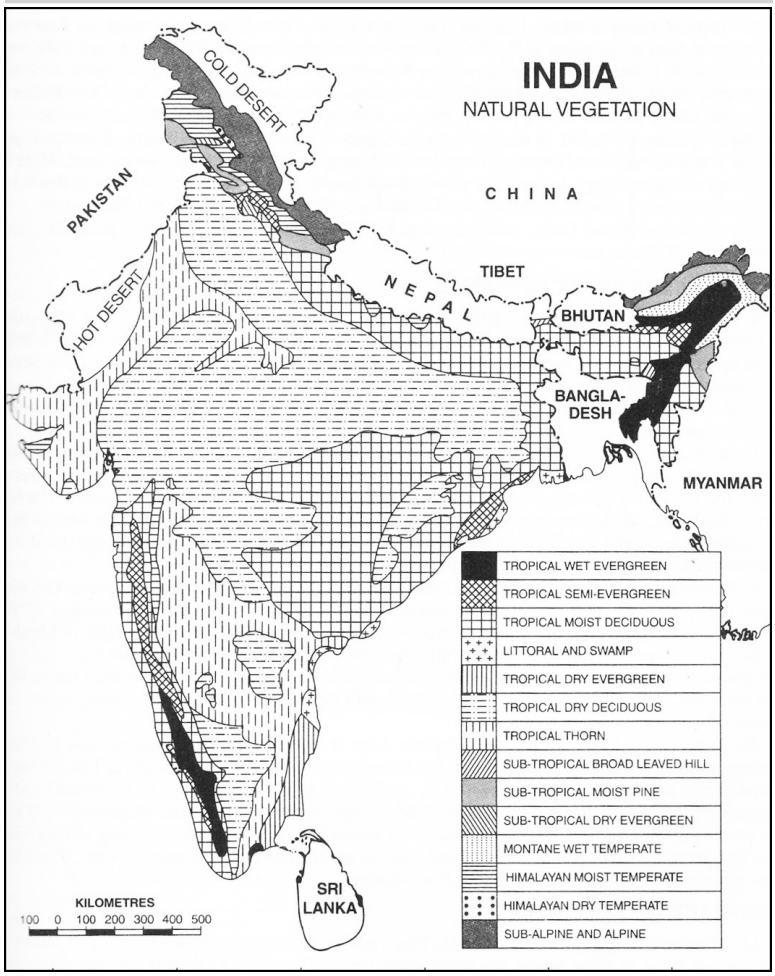
NATURAL VEGETATION

Natural Vegetations or the forest type of India vary from place to place depending upon several factors such as climate, soil, rainfall, temperature as well as their seasonal variation along with varied edaphic and biotic conditions. Various botanist and ecologist have given different classification on the basis of climatic and adaptive factors. On the basis of such suggestion a generalised classification can be done with 5 main types and 16 sub types of vegetation.

Classification of Natural Vegetation

Type	Sub- Types
Moist Tropical Forest	• Tropical wet Evergreen • Tropical semi evergreen • Tropical Moist Deciduous • Littoral and Swamp
Dry Tropical Forest	• Tropical dry evergreen • Tropical dry deciduous • Tropical Thorn
Montane Sub –tropical Forest	• Sub tropic Broad leaved hill • Sub tropical Moist hills (pine) • Sub tropic dry evergreen
Montane Temperate Forest	• Montane Wet Temperate • Himalayan Moist Temperate • Himalayan Dry Temperate
Alpine Forest	• Sub- Alpine • Moist – Alpine Scrub • Dry Alpine Scrub

Spatial Distribution of Natural vegetation in India



LANGUAGES

According to the schedule eight of our constitution, there are 22 officially recognized languages in India; among all, Hindi dominates the scene as it is spoken by 41.03 per cent of people followed by Bengali (8.11 %), Telugu (7.19 %), Marathi (6.99), Tamil (5.91 %) and Urdu (5.01%). Sanskrit, Bodo, Manipur, Dogari and Konkani are the languages which have least speakers in India. Bodo, Dogri, Maithili and Santali were added to the Eighth Schedule with the passing of the 100th Amendment to the Constitution of India in 2003, taking the total number of Scheduled languages to 22 in 2001. There are

total 234 identifiable mother tongues which have returned 10,000 or more speakers each at the all-India level, comprising 93 mother tongues grouped under the Scheduled Languages (Part A) and 141 mother tongues grouped under the Non-Scheduled languages (Part B). Those mother tongues which have returned less than 10,000 speakers each and which have been classified under a particular language are included in "others" under that language.

Official languages in India: Article 343 of the Indian Constitution considers Hindi to be the official language of the country along with English to be an additional language. Other than these two French and Portuguese are the official languages of Ponducherry and Goa respectively.

AGRICULTURE IN INDIA

A wide range of crops can be grown in India as the land is supported by element essential for crop growth such as relief, soil, climate, abundant sun shine and long growing seasons. The major Indian crop can be divided into following categories.

Food Crops: Rice, Wheat, Maize, Millet,Jower, Bajra, Ragi, and pulses like Gram, Tur (Arhar)

Cash Crops: Cotton, Jute, Sugarcane, Tobacco, Oilseeds, Ground Nut, Linseed, Sesame, Castor seed, Rape seed, Mustard

Plantation Crops: Tea, Coffee, Spices, Cardamom, Chilles, Ginger, Turmeric, Coconut, Areca nut and Rubber

Horticulture: Apple, Peach, Pear, Apricot, Almond, Strawberry, Walnut, Mango, Banana, Citrus Fruit, Vegetables.

Land Use Pattern in India

Reporting area for land utilisation statistics in India was recorded to be 305611, out of which only 45.84 per cent of it is net sown area. 17.07 are sown more than ones in a year. Total cropped area accounted for 62.89 per cent.

Agro-climatic Regions

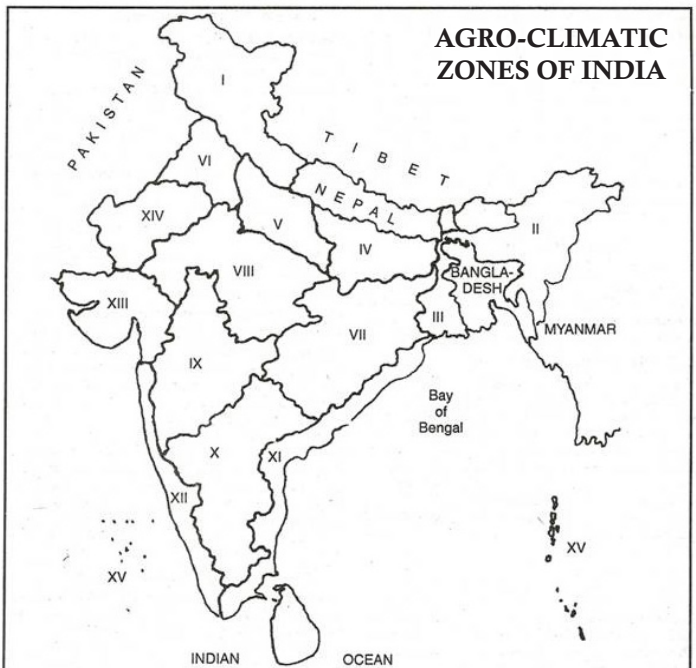
(i) **Western Himalayan Region**: Jammu and Kashmir, Himachal Pradesh and the hill region of Uttarakhand fall into it. Valley floors grow rice, while the hilly tracts grow maize in the kharif season. Winter crops are barley, oats, and wheat. Apple orchards and other temperate fruits such as peaches, apricot, pears, cherry, almond, litchis, walnut, etc. Saffron is grown in this region.

(ii) **Eastern Himalayan Region:** Arunachal Pradesh, hills of Assam, Sikkim, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, and the Darjeeling district of West Bengal come into this region. Annual rainfall is 200-400 cm. The main crops are rice, maize, potato, tea. Orchards of pineapple, litchi, oranges and lime are also found.

(iii) **Lower Gangetic Plain Region:** located in West Bengal (except the hilly areas), eastern Bihar and the Brahmaputra valley lie in this region with the rainfall of 100 cm-200 cm. Rice is the main crop which at times yields three successive crops (Aman, Aus and Boro) in a year. Jute, maize, potato, and pulses are other important crops.

(iv) **Middle Gangetic Plain Region:** large parts of Uttar Pradesh and Bihar are covered and recieve100 cm and 200 cm of rainfall. Rice, maize, millets grow in kharif; wheat, gram, barley, peas, mustard and potato in rabi are important crops.

(v) **Upper Gangetic Plains Region:** Central and western parts of Uttar Pradesh and Hardwar and Udham Nagar districts of Uttarakhand fall into it. Rainfall is between 75 cm-150 cm. Wheat, rice, sugarcane, millets, maize, gram, barley, oilseeds, pulses and cotton are the main crops.



(vi) **Trans-Ganga Plains Region**: Punjab, Haryana, Chandigarh, Delhi and the Ganganagar district of Rajasthan come under it. Rainfall varies between 65 cm and 125 cm. The main crops are wheat, sugarcane, cotton, rice, gram, maize, millets, pulses and oilseeds etc. The region faces the threat of water logging, salinity, alkalinity, soil erosion and fall of water table.

(vii) **Eastern Plateau and Hills**: Jharkhand, Orissa, Chhattisgarh and Dandakaranya come under it. 80 cm-150 cm of annual

rainfall is received. Rice, millets, maize, oilseeds, ragi, gram, potato, tur, groundnut and soyabean grow on rainfed areas.

(viii) **Central Plateau and Hills:** Bundelkhand, Baghelkhand, Bhander Plateau, Malwa Plateau, and Vindhyachal Hills receive rainfall 50 cm-100 cm. Crops like millets, wheat, gram, oilseeds, cotton and sunflower grow in this region.

(ix) **Western Plateau and Hills:** Malwa plateau and Deccan plateau (Maharashtra), 25 cm-75 cm. Wheat, gram, millets, cotton, pulses, groundnut, and oilseeds are the main crops in the rain-fed areas, while in the irrigated areas, sugarcane, rice, and wheat, are cultivated.

(x) **Southern Plateau and Hills:** Interior Deccan includes parts of southern Maharashtra, the greater parts of Karnataka, Andhra Pradesh, and Tamil Nadu uplands from Adilabad district in the north to Madurai district in the south. Annual rainfall is between 50 cm and 100 cm. Millets, oilseeds, pulses grows here.

(xi) **Eastern Coastal Plains and Hills:** Coromandal and northern Circar coasts of Andhra Pradesh and Orissa come into it. Annual rainfall here varies between 75 cm and 150 cm. Main crops include rice, jute, tobacco, sugarcane, maize, millets, groundnut and oilseeds. Cultivation of spices (pepper and cardamom) and development of fisheries is also done.

(xii) **Western Coastal Plains and Ghats:** Malabar and Konkan coastal plains and the Sahyadris are included in it. Annual rainfall is more than 200 cm. Rice, coconut, oilseeds, sugarcane, millets, pulses and cotton are the main crops. The region is famous for plantation crops and spices.

(xiii) **Gujarat Plains and Hills:** They includes hills and plains of Kathiawar, and the fertile valleys of Mahi and Sabarmati rivers. Annual rainfall varies between 50 cm and 100 cm. Groundnut, cotton, rice, millets, oilseeds, wheat and tobacco are the main crops. It is an important oilseed producing region.

(xiv) **Western Dry Region:** Extended over Rajasthan, West of the Aravallis, this region has an erratic rainfall of an annual average of less than 25 cm. Horticultural crops like water melon, guava and date palm grow here.

(xv) **Island Region:** It includes Andaman-Nicobar and Laksha-dweep which have typically equatorial climate (annual rainfall less than 300 cm). Main crops are rice, maize, millets, pulses, turmeric and cassava. Nearly half of the cropped area is under coconut. The area is covered with thick forests and agriculture is in backward stage.

Major Growing Seasons in India:

Kharif (July to October): Major crops are rice, maize, sorghum, pearl millet/bajra, finger millet/ragi (cereals), arhar (pulses), soyabean, groundnut (oilseeds), cotton etc.

Rabi (October to March): Major crops wheat, barley, oats (cereals), chickpea/gram (pulses), linseed, mustard (oilseeds) etc.

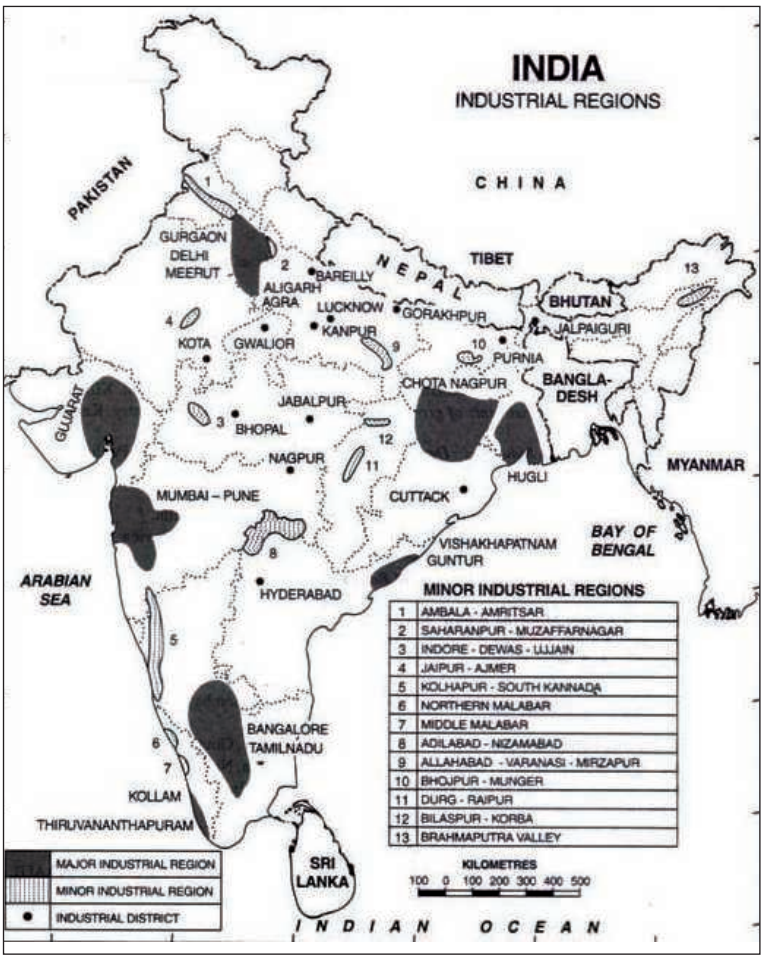
Zaid (March to June): Muskmelon, Watermelon, Vegetables of cucurbitacae family such as bitter gourd, pumpkin, ridged gourd etc.

INDUSTRY

Major Industrial Regions of India

There are eight major industrial regions in India.

1. Mumbai-Pune Industrial Region
2. Hugli Industrial Region
3. Bangalore-Tamil Nadu Industrial Region
4. Gujarat Industrial Region
5. Chotanagpur Industrial Region
6. Vishakhapatnam-Guntur Industrial Region
7. Gurgaon-Delhi-Meerut Industrial Region
8. Kolfam-Thiruvananthapuram Industrial Region



Major Industrial Type

As per the type raw materials used in the industry and its finished product, the categories of Indian Industry can be divided into:

- Agro Based Industry
  - Cotton Textile
  - Jute Textile
  - Sugar
  - Silk
- Metallurgical Industry
  - Iron and Steel Industry
  - Aluminum smelting Industry
- Engineering Industry
- Fertilizer Industry
- Aircraft Industry
- Glass Industry
- Cement Industry
- Chemical Industry

MINERALS IN INDIA

Minerals are the natural resources which are used in many industries as raw materials. Iron ore, manganese, bauxite, copper, etc. are such minerals. Minerals are of two types: **metallic** and **non-metallic**. Iron ore and copper are metallic minerals while limestone and dolomite are non-metallic minerals.

Metallic minerals are further sub-divided into **ferrous** and **non-ferrous minerals**. Those metallic minerals which have iron content belong to ferrous group. The metallic minerals belonging to non-ferrous group do not have iron content.

India is rich in iron, mica, manganese, bauxite; self sufficient in antimony, building materials, cement materials, clay, chromite, lime, dolomite, and gold, but deficient in copper, lead, mercury, zinc, tin, nickel, petroleum products, rock phosphate, sulphur, and tungsten.

Mineral resources like potassium are totally absent and have to be imported. Minerals like crude petroleum (which accounts for about 80 per cent of the total value of Indian imports) diamonds (uncut), sulphur, and rock phosphorus are imported.

The state with the highest mineral output is Jharkhand. India is rich in ferrrous metals but its reserves of non-ferrous metals are poor.

Mineral	Ore	Found in	Features
Iron	**Magnetite**—the best quality of iron ore and contains 72% pure iron. **Haematite**-contains 60 to 70% pure iron. **Limonite**-contains 40 to 60% pure iron. **Siderite**-contains many impurities and has just 40 to 50% pure iron.	Odisha (Sonai, Mayubhanj, Keonjhar), Jharkhand and Bihar (Singhbhum Hazaribagh, Palamau, Shahbad), Chhattisgarh and Madhya Pradesh (Raipur, Durg, Bastar, Raigarh, Bilaspur, Jabalpur, Balaghat), Andhra Pradesh (Krishna, Kurnool, Chittor, Cuddapha, Warangal, Guntur), Tamil Nadu (Salem, Tiruchirapalli), Karnataka (Ballary, Chitradurg, Chikmagalur), Maharashtra (Ratnagiri, Chanda), Goa	India has the world's largest reserves, approximately one-fourth of world's known reserves; Jharkhand has the largest reserves accounting for about 25% of the total reserves of iron ore in India.

Coal (Black Gold)	**Anthracite Coal**—the best quality of coal and contains 80 to 95% carbon. It is found only in Jammu and Kashmir in small quantity. **Bituminous coal**—The most widely used coal and contains 40 to 80% carbon. It is found in Jharkhand, Orissa, West Bengal, Chhattisgarh and Madhya Pradesh. **Lignite**– Also known as brown coal. It is a lower grade coal and contains about 40 to 50% carbon. It is found in Palna of Rajasthan, Neyveli of Tamil Nadu, Lakhimpur of Assam and Karewa of Jammu and Kashmir. **Peat**–It is the first stage of transformation of wood into coal and contains less than 40% carbon.	Bihar-Jharkhand-Bengal belt (Raniganj, Jharia, Giridih, Bokaro, Karanpur), Madhya Pradesh and Chhattisgarh belt (Singrauli, Korba, Raigarh, Sonhat, Sohagpur. Umaria), Odisha (Desgarh, Talcher), Maharashtra (Chand), Andhra Pradesh (Singreni), Assam (Makum, Lakhimpur); in small quantities in Arunachal Pradesh, Meghalaya, Jammu and Kashmir, and Nagaland	"About one-fourth of India's coal reserves lie in the modarValley, across Bihar, Jharkhand, and West Bengal. India is the fourth largest coal producing country in the world according to 1992 coal production in the country."
Manganese	India has the second largest manganese ore reserves in the world after Zimbabwe. India is the fifth largest producer in the world after Brazil, Gabon, South Africa and Australia.	Odisha (Keonjhar, Kalahandi, Mayurbhaj, Talcher) Madhya Pradesh (Balaghat, Seoni, Chhindwara, Jabalpur), Maharashtra (Nagpur, Bhandara, Ratnagiri), Gujarat (Panchmahal), Karnataka (Chitradurg, Tumkur, Shimoga, Chikmagalur, Belgaum, North Canara, Dharwar), Jharkhand (Singbhum), Andhra Pradesh (Visakhapatnam), Rajasthan (Udaipur, Bansawara)	Odisha is the leading producer of manganese in the country. India ranks third in world in manganese production.
Mica	The three major types of mica found in India are – Muscovite, Phlogopite and Biotite.	Bihar (Gaya Monghyr), Jharkhand (Hazaribagh), Rajasthan (Ajmer, Shahpur, Tonk, Bhilwara, Jaipur), Andhra Pradesh (Nellore)	India has largest deposits of mica in world India alone contributes about two-thirds of the world's production

Bauxite (aluminium ore)		Jharkhand (Palamu), Gujarat (Kaira), Madhya Pradesh (Katni, Jabalpur, Balaghat, Bilaspur, Bastar), Tamil Nadu (Salem), Karnataka (Chitradurg, Belgaum), Maharashtra (Kolhapur), Jammu and Kashmir (Kotli)	Third largest producer in the world.
Copper	India contributes to about 3.5 to 4% of the world's total production of copper.	Jharkhand (Singhbhum, Hazaribagh), Rajasthan (Khetri, Alwar, Bhilwara, Jhunjhunu, Sirohi), Andhra Pradesh (Guntur, Khamman, Agnigundala), Karnataka (Chitradurg, Hassan, Chikmagalur, Raichur), Madhya Pradesh (Balaghat), Gujarat (Banaskantha); some quantities also found in Sikkim, Punjab, Uttar Pradesh, and Tamil Nadu.	Very meager reserves; almost all copper comes from Singbhum and Hazaribagh in Jharkhand and Khetri in Rajasthan.
Crude oil	51.08 crore tones	Assam, Tripura, Manipur, West Bengal, Ganga Valley, Himachal Pradesh, Kutch of West Bengal coast, Orissa, Andhra Pradesh, Maharashtra, and Gujarat.	
Lignite	429 crore tones	Tamil Nadu (Neyveli fields) Some deposits also found in Gujarat, Punducherry, Rajasthan (Palana fields), Jammu and Kashmir (Riasi fields).	Maximum deposits of about 383 crore tones, are found in Tamil Nadu.
Gold	India's contribution to gold production across the world is less than one percent (0.75%).	Karnataka (Kolar gold fields, Hutti Mines), in small quantities in Andhra Pradesh (Ramgiri gold fields and Anantpur).	Karnataka was the leading producer of gold accounting for 99% of the total production. The remaining production came from Jharkhand.
Magnesite	23.91 crore tones	Tamil Nadu (Salem), Uttranchal (Almora, Chamoli, Pithoragarh), Karnataka (Mysore, Hassan)	

CENSUS 2011

The 15th Indian National census was conducted in two phases, houselisting and population enumeration. Information for National Population Register was also collected in the first phase, which will be used to issue a 12-digit unique identification number to all registered Indians by Unique Identification Authority of India.

According to the provisional reports released on March 31, 2011, the Indian population increased to 1.21 billion with a decadal growth of 17.64%. Adult literacy rate increased to 70.04% with a decadal growth of 9.21%.

The exercise, conducted every 10 years, faced big challenges, not least India's vast area and diversity of cultures and opposition from the manpower is involved. Information on castes was included in the census following demands from several ruling coalition and opposition parties.

Census Data

Population	Statistics
Total Population	1,21,01,93,422 (persons)
Males	62,37,24,248
Females	58,64,69,174
Ratio	940 Females/1000 Males
Decadal Growth (2001-2011)	18,14,55,986 (17.64%)
Density of Population	382 per sq. km.
Literacy (in percent)	Total; 74.04, Males: 82.14, Females: 65.46

HIGHEST/LOWEST POPULATION

State with Highest Population	Uttar Pradesh	166,197,921
State with Lowest Population	Sikkim	540,851
UT with Highest Population	Delhi	13,850,507
UT with Lowest Population	Lakshadweep	60,650
District with Highest Population	Medinipur (West Bengal)	9,610,788
District with Lowest Population	Yanam (Pondicherry)	31,394

Population Density Persons/Sq. Km.		
India		325
State with highest Population Density	West Bengal	903
State with lowest Population Density	Arunachal Pradesh	13
UT with Highest Population Density	Delhi	9,340
UT with Lowest Population Density	Andaman & Nicobar Islands	43
District with Highest Population Density	North East (Delhi)	29,468
District with Lowest Population Density	Lahul & Spiti (Himachal Pradesh)	2

Sex Ratio (Females per Thousand Males)	
India	933
Rural	946
Urban	900
State with Highest Female Sex Ratio Kerala	1,058
State with Lowest Female Sex Ratio Haryana	861
UT with Highest Female Sex Ratio Pondicherry	1,001
UT with Lowest Female Sex Ratio Daman & Diu	710
District with Highest Female Sex Ratio Mahe (Pondicherry)	1,147
District with Lowest Female Sex Ratio Daman (Daman & Diu)	591

Scheduled Castes & Scheduled Tribes Population

	Population	Percentage
Scheduled Castes	166,635,700	16.2%
Scheduled Tribes	84,326,240	8.2%

Scheduled Castes

State with highest proportion of Scheduled Castes	Punjab (28.9%)
State with lowest proportion of Scheduled Castes	Mizoram (0.03%)
UT with highest proportion of Scheduled Castes	Chandigarh (17.5%)
UT with lowest proportion of Scheduled Castes	D&N Haveli (1.9%)
District with highest proportion of Scheduled Castes	Koch-Bihar (50.1%)
District with lowest proportion of Scheduled Castes	Mizoram (0.01%) Lawngtlai

Scheduled Tribes

State with highest proportion of Scheduled Tribes	Mizoram (94.5%)
State with lowest proportion of Scheduled Tribes	Goa (0.04%)
UT with highest proportion of Scheduled Tribes	Lakshadweep (94.5%)
UT with lowest proportion of Scheduled Tribes	A & N Islands (8.3%)
District with highest proportion of Scheduled Tribes	Sarchhip, Mizoram (98.1%)
District with lowest proportion of Scheduled Tribes	Hathras, Uttar Pradesh (0.01%)

Religion Based Data

Religious	Composition	Population * (%)
Hindus	827,578,868	80.5
Muslims	138,188,240	13.4
Christians	24,080,016	2.3
Sikhs	19,215,730	1.9
Buddhists	7,955,207	0.8
Jains	4,225,053	0.4
Other Religions & Persuasions	6,639,626	0.6
Religion not stated	727,588	0.1
Total *	1,028,610,328	100

Rural Urban Distribution

Rural-Urban Distribution	Population	(%)
Rural	742,490,639	72.18%
Urban	286,119,689	27.82%
State with highest proportion of Urban Population	Goa	49.8
State with lowest proportion of Urban Population	Himachal Pradesh	9.8
UT with highest proportion of Urban Population	Delhi	93.2
UT with lowest proportion of Urban Population	Dadra & Nagar Haveli	22.9

QUICK FACTS

- India's population has jumped to 1.21 billion, an increase of more than 181 million during 2001-11, according to provisional data of Census 2011 released.
- Though the population is almost equal to the combined population of the U.S, Indonesia, Brazil, Pakistan, Bangladesh and Japan (1,214.3 million).
- The percentage decadal growth rates of the six most populous States have declined during 2001-11 compared with 1991-2001.
- The overall sex ratio nationwide has increased by seven percentage points to 940 against 933 in Census 2001. Sex ratio is defined as the number of females per 1,000 males. An increase in sex ratio was observed in 29 States/Union Territories. Kerala with 1,084 has the highest sex ratio followed by Puducherry with 1.038. With 618, Daman and Diu has the lowest ratio.
- An increasing trend in the child sex ratio was seen in Punjab, Haryana, Himachal Pradesh, Gujarat, Tamil Nadu, Mizoram and the Andaman and Nicobar Islands, but in the remaining States/UTs, the ratio showed a decline. The total number of children in the age group of 0–6 is now 158.8 million, less by five million since 2001.
- The literacy rate has gone up from 64.83 per cent in 2001 to 74.04 per cent, an increase of 9.21 percentage points.
- Kerala, with 93.91 per cent, continues to occupy the top position among States as far as literacy is concerned, while Mizoram's Serchhip district (98.76 per cent) and Aizawl (98.50 per cent) recorded the highest literacy rates among districts. Madhya Pradesh's Alirapur district has the lowest literacy rate of 37.22 per cent as also the naxalite-affected Chhattisgarh's Bijapur district, where the literacy rate is 41.58 per cent. Lakshadweep followed kerala with a literacy level of 92.28 per cent, while Bihar remained at the bottom of the ladder at 63.82 per cent, followed by Arunachal Pradesh at 66.95 per cent.
- A significant milestone reached in the 2011 census is the fall in the number of illiterate persons by 31,196,847. Of the total decrease in the number of illiterates, women comprise 17,122,197 and men, 14,074,650.

WORLD GEOGRAPHY–MIND MAP

Language

- Chinese
- Spanish
- English
- Hindi
- Arabic
- Portuguese
- Bengali
- Russian
- Japanese
- Javanese

Religion

- Christianity
- Islam
- Hinduism
- Chinese Folk Religion
- Buddhism

Climatic Zone

- Equatorial Zone
- Hot Zone
- Warm Temperate Zone
- Cool Temperate Zone
- Cold Zone
- Alpine Zone

Industrial Region

- USA and Canada Industrial Region
- European Industrial region
- Asian Major Industrial Region

Continents

- Asia
- Africa
- North America
- South America
- Europe
- Australia
- Antarctica

Things to Remember

- Continent's Highest & Largest Points
- Highest Mountain Peaks
- Deepest Oceans
- Some important Boundary lines
- Longest Rivers
- Deepest Lakes
- Largest Deserts
- Deepest Trenches
- Some important Tribes and their Homeland

INFORMATION BULLETIN

- Total Surface Area - 510, 072,000 km²
- Land Area - 148,094,000 km²
- Water Area - 361,132,000 km²
- Percentage of Land - 29.2%
- Percentage of Water - 70.8%
- Water Type - 97% salt water, 3% fresh water
- Circumference - 40,066 km at Equator, 39,992 km at Poles
- Continents - 7 recognized
- Countries - 193 recognized
- Oceans - 5
- Population - 7,214,958,996 (2015)
- Largest continent - Asia (43,810,582 km²)
- Most populated continent - Asia (4,361,416,312) 2015
- Smallest continent - Australasia/ Oceania (8,112,000 km²)
- Least populated continent- Antarctica (no native population)
- Largest country - Russia (17,075,400 km²)
- Most populated country - China (1,401,586,609) 2015
- Smallest country - Vatican City (0.44 km²)
- Least populated country - Vatican City (842) 2014
- Highest point - Mount Everest (8,848 m)
- Lowest point - Dead Sea (-409 m)
- Largest Ocean - Pacific (155,557,000 km²)
- Smallest Ocean - Arctic (14,056,000 km²)
- Largest Sea - South China (2,974,600 km²)
- Largest Lake - Caspian Sea (371,000 km²)
- Longest River - Nile (6,695 km)

LANGUAGES

There are numerous languages in the world but they have varying number of speakers for each one of them. Approximately 2,300 languages are spoken in Asia, 2,140, in Africa, 1,300 in the Pacific, 1,060 in the Americas, and 280 in Europe (2015). Their existence depends on the number of speakers the language has. There are chances that nearly 90% of the 7, 080 languages would extinct. Chinese tops the list of most popular world languages, with over one billion speakers. English trails in third place, with 335 million speakers. This data represents first-language speakers.

Major Languages Spoken in the World

Language	Approx. number of speakers
1. Chinese	1,197,000,000
2. Spanish	414,000,000
3. English	335,000,000
4. Hindi	260,000,000
5. Arabic	237,000,000
6. Portuguese	203,000,000
7. Bengali	193,000,000
8. Russian	167,000,000
9. Japanese	122,000,000
10. Javanese	84,300,000

MAJOR RELIGION OF THE WORLD

Religion	Followers (in millions)
Christianity	2,200
Islam	1,600
Hinduism	1,100
Chinese folk religion	754 — 1,000
Buddhism	488 — 535

WORLD CLIMATIC TYPES

Climate Zone	Latitude	Climate Type	Rainfall Regime	Natural Veg
Equatorial zone Hot Zone	0°-10°N and S 10°-30°N and S	1. Hot we equatorial 2. (a) Tropical Monsoon (b) Tropical Marine 3. Sudan Type 4. Desert : (a) Sahara type (b) Mid-latitude type	Rainfall all year round Heavy summer rain Much summer rain 70 inches Rain mainly in summer 30 inches Little rain : 5 inches	Equatorial rain forests Monsoon forests Savana (Tropical grassland) Desert vegetation and scrub
Warm Temperate zone	30° - 45°N and S	5. Western Margin (Mediterranean types) 6. Central Continental (Stepe type) 7. Eastern Margin (a) China type (b) Gulf type (c) Netal type	Winter rain : 35 inches Light summer rain 20 inches Heavier summer rain : 45 inches	Mediterranean forests and shrub Steppe or temperate grassland Warm, wet forests bamboo
Cool Temperate zone	48°-65°N and S	8. Western Margin (British type) 9. Central Continental (Siberian type) 10. Eastern Margin (Laurentian type)	More rain in autumn and winter, 30 inches Light summer rain: 25 inches Moderate summer rain 40 inches	Deciduous forests Evergreen confierous forests Mixed forests (coniferous and deciduous)
Cold zone	65°-90°N and S	11. Arctic or Polar	Very light summer rain 10 inches	Tundra, mosses lichens
Alpine Zone		12. Mountain climate	Heavy rainfall (variable)	Alpine, mosses lichens Alpine pastures, conifers, fern, snow

MAJOR INDUSTRIAL REGIONS OF THE WORLD

Industrial regions are those areas, where the focus of industries has occurred due to favourable geo-economic conditions. These are areas where manufacturing industries are carried out on a relatively large scale and employ a relatively large proportion of population. The industrial regions of the world are very unevenly distributed. With the development of machinery, many industrial centres have come up where there is abundance of coal, iron, and extensive water-power are in abundance.

The major industrial regions of the world are as follows:

- **USA and Canada Industrial Regions**
  Industrial region of USA and Canada comprises the New England Regions, The New York - Mid-Atlantic Region, North - Eastern Region. The Southern Region, Western Region & Pacific Region. These regions include several major American industrial cities & Metropolitans like Hartford, New Havan, areas from New York to Baltimore with New Jersey, Chicago, Detroit, Houston, etc.
- **European Industrial Region**
  - Western Europe major industrial regions.
  - United Kingdom's industrial regions are located in Lancashire, London's basin, Scotland, Midland,South-Wales, etc. producing manufacturing products like engineering, ferrous, chemical textile,food & beverages, etc.
  - The Saar Region, the Hamburg Region, Berlin Region & Leipzig Region with iron & steel heavy chemicals, textiles & different consumer goods Industries.
  - France's industrial region produces iron & steel, textile, glass, leather, automobiles with Northern, Lorraine & Paris Industrial Regions. Other European countries like Italy, Switzerland, Holland Belgium and Sweden are industrial giants.
  - Eastern Europe has six major industrial regions Out of which four are in Russia, one in Ukraine, and one in southern Poland and northern Czech Republic.
- **Asian major**
  - China is most dominant and powerful industrial agglomerations of Asia. The regions of Manchurian region, Yangtze region, North-china region, South China region, etc. with manymanufacturing units producing steel, heavy chemical's textiles, paper, cement, automobiles, toys, etc are major industrial regions.
  - Japan has several industrial cities producing steel, Pedro-chemical, cement, footwear. toys, etc. at Tokya-Yokohama region, Osaka - Kobe region, north Kyushu region.
  - India's conurbation of Calcutta, the Mumbai-Pune Industrial belt,

Ahemadabad-Vadodara belt, Southern industrial regions with Chennai, Coimbatore, Bangalore industrial belt, Damodar Valley industrial belt, Northern regions with centers like Delhi, Ambala, Gaziabad, Mathura, etc. Other major industrial regions include Allahadad, Varanasi, Hyderabad, Patiala, Jaipur, Bilaspur, Jullundhar, Meerut, Lucknow, Kanpur, etc.

MAJOR INDUSTRIAL CENTRES OF THE WORLD

Country	Major Industrial Centers	Industries
Britain (Midland is the largest Industrial region centered at Birmingham)	Birmingham	Iron & Steel, Heavy Machinery
	Coventry	Automobile
	Burton-on-Trent	Brewing (largest brewery town of Britain)
	Stoke-on-Trent	Pottery (Pottery capital of Britain)
	New Castle	Shipbuilding
	Middlesbrough	Iron & Steel
	Bradford, Halifax, Leeds	Worsted textile, Garments
	Shefield (World's largest cutlery town)	Cutlery, Iron & Steel
	Manchester (Lancashire region)	Cotton textile
	Liverpool & Birkenhead	Shipbuilding
	Along Manchester Canal	Heavy chemicals
	Glosgow, Hamilton, Motherwell, Coatbridge	Iron & Steel
	Pot Glasgow	Shipbuilding
	Belfast region (Main industrial region of Ireland)	Shipbuilding & Linen industry
France	Lille	Textiles
	Dunkirus	Iron & Steel
	St. Etienne	Armaments & Bicycle
	Limoges	Pottery
	Lyone	Silk making
	Marseilles	Oil refineries
	Paris	Aircraft & Transport
	Champaque	Wine
	Lorrensar	Iron & Steel
Germany (Ruhr-Westphalia region, served by Rhine River, is the largest industrial	Frankfurt	Railway engineering
	Mainz	Leather, Brewing, Engineering
	Mannheim, Ludwigshafen	Chemical, electrical engineering, Iron & Steel.

region of Germany This industrial region is connected to North sea by Dortmund-Ems canal)	Hamburg	Shipbuilding
	Munich	Photographic equipment, Musical instrument
	Stuttgart	Automobile
	Aachen	Iron & Steel, Textile
	Leipzig	Optical instrument
	Jena Zeiss	Photographic equipment
	Dresden	Porcelain
	Karl Marx Stadt	Textiles
Belgium	Liege	Iron & Steel, Guns, pistols & other firearms
	Antwerp	Diamond cutting
	Ghent	Linen textiles
Luxemberg Netherland	Luxemberg city	Engineering
	Rotterdam	Shipbuilding and marine engineering
	Amsterdam	Diamond cutting
	Arnhem	Tin smelting
Sweden	Goteborg	Shipbuilding
	Stockhom	Shipbuilding
Switzerland	Zurich	Engineering and Textiles
	Basel	Engineering
	Baden	
Denmark	Kopenhagen	Dairy
Italy	Milan (main industrial region)	Silk textile
	Turin (Detroit of Italy)	Motor Car
U.S.A. (Great Lake region) is the most important industrial region	Boston	Shipbuilding
	Pittsburg	Iron and Steel (Iron & Steel capital of the world)
	Akron	World's largest synthetic rubber and tyre making centre
	Detroi	Motor car and Aeroplane
	Pontiac	Cars and it's spare parts
	Flint	
	Gary	Iron and Steel
	Chicago	
	Toledo	Automobile
	Birmingham	Iron and Steel
	Troy	Garment
	Buffalo	Iron and Steel, Machine (It is also the largest flour milling centre of U.S.A.)
	San Fransisco (Silicon Valley)	Oil refining, Shipbuilding, Computer technology

	Los Angels (Hollywood)	Film and Aircraft
Canada	Montreal Toronto Otawa Hamilton Birmingham) of Canada) Quebec	Shipbuilding and Aircraft Engineering and Automobile Paper Iron and Steel, Engineering Shipbuilding & Marine Engineering
Russia	Moscow and Gorky Magnitogost Leningrad (St. Petersberg)	Iron and Steel, Chemicals Iron and Steel, Oil refining Textile, Chemical, Paper
Ukraine	Krivoyrog	Iron & Steel and Heavy Machinery
Argentina	Bueons Aires	Shipbuilding
China	Shanghai Wuhan	Textile and Machinery Textile, Machinery, Shipbuilding, Iron and Steel
Japan	Nagoya (Detroit of Japan) Osaka (Manchester of Japan) Kyoto and Kobe Tokyo Nagasaki	Aircraft, Car, Machinery Shipbuilding, Textile, Iron & Steel Shipbuilding, Testtile, Iron & Steel Shipbuilding, Engineering, and Textile Shipbuilding, Iron and Steel, Machinery

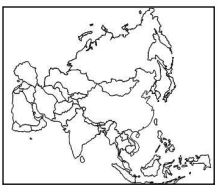
CONTINENTS OF WORLD

A continent is one of the large landmasses on Earth generally identified by convention rather than any strict criteria, with up to seven regions commonly regarded as continents. They are Asia, Europe, Africa, North America, south America, Australia and Antarctica.

Continent	% of Earth Area	Continents (by the number of countries)
1. Asia	29.5	44
2. Africa	20.4	54
3. North America	16.3	23
4. South America	11.8	12
5. Europe	7.1	46
6. Australia or oceania	5.3	14
7. Antarctica	9.6	

Asia

Asia is the world's largest continent, having an area of 44,444,100 sq km. Asia covers to the east of the Suez Canal, the Ural River, and the Ural Mountains, and south of the Caucasus Mountains and the Caspian and Black Seas. It is bounded on the east by the Pacific Ocean, on the south by the Indian Ocean and on the north by the Arctic Ocean.



Physical Features

Region-wise it can be classified into 6 regions which are as follow:

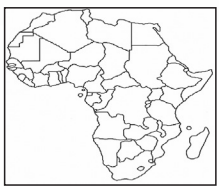
- **Central Asia :** Kazakhstanb, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
- **Eastern Asia :**China, Hong Kong, Japan, North Korea, South Korea, Macau, Mongolia, Taiwan
- **Northern Asia :** Russia
- **Southeastern Asia:** Brunei, Myanmar, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Timor-Leste, Vietnam
- **Southern Asia:** Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
- **Western Asia :** Armeniae, Azerbaijana, Bahrain, Cypruse, Georgiaa, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, State of Palestine, Qatar, Saudi Arabia, Syria, Turkeya, United Arab Emirates, Yemen.

Natural Vegetation of Asia

- The Tundra
- The Taiga
- Temperate Grasslands, the Steppes
- Mediterranean Scrubland and Forest
- Desert Vegetation
- Monsoon Region:
- Tropical Rainforest
- Vegetation in the Mountains

Africa

Africa is the second largest continent in area (30,330,000 sq Km), covers six percent of Earth's total surface area and 20.4 percent of its total land area. Algeria is Africa's largest country by area, and Nigeria by population. Africa's population is the youngest among all the continents; 50% of Africans are 19 years old or younger. Separated from Europe by the Mediterranean Sea, it is joined to Asia at its northeast extremity by the Isthmus of Suez 163 km wide.



Physical Features

Region-wise it can be classified into 6 regions which are listed below.

- **Northern Africa :** Algeria, Canary Islands, Santa Cruz de Tenerife, Ceuta, Egypt, Libya, Madeira, Melilla, Morocco, Sudan, Tunisia, Western Sahara.
- **Northeast Africa :** Djibouti, Eritrea, Ethiopia, Somalia
- **Eastern Africa :** Burundi, Comoros, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Reunion, Rwanda, Seychelles, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.
- **Central Africa :** Angola, Cameroon, Central African Republic, Chad, Republic of the Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, São Tomé and Príncipe.

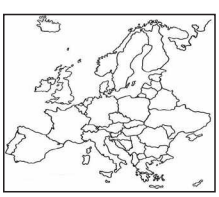
- **Southern Africa:** Botswana, Lesotho, Namibia, South Africa, Swaziland
- **Western Africa:** Benin, Burkina Faso, Cape Verde, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone, Togo

Natural Vegetation of Africa

- Tropical Rain Forests
- Tropical Savannas
- Tropical Steppes and Deserts
- Mediterranean Forests
- Montane Forests
- Mangrove Forests

Europe

The continent comprises the westernmost part of Eurasia bordered by Arctic Ocean in north, the Atlantic Ocean in west, and the Mediterranean Sea to the south. To the east and southeast, it is separated from Asia by the watershed divides of the Ural and Caucasus Mountains, the Ural River, the Caspian and Black Seas, and the waterways of the Turkish Straits. The coastline of Europe is 80500 km, which is longer than Africa. It is the second smallest continent in the world.



Physical Features

Region-wise classification of Europe can be as follows

- **European High lands**
- **Western Uplands :** Landscape of Scandinavia (Norway, Sweden, and Denmark), Finland, Iceland, Scotland, Ireland, the Brittany region of France, Spain, and Portugal.
- **Central Uplands :** Central Europe and include western France and Belgium, southern Germany, the Czech Republic, and parts of northern Switzerland and Austria.
- **Alpine Mountains :** The Italian and Balkan peninsulas, northern Spain, and southern France. The region includes the mountains of the Alps, Pyrenees, Apennines, Dinaric Alps, Balkans, and Carpathians.
- **North European Plain :** France, Belgium, the Netherlands, Germany, Denmark, Poland, the Baltic states (Estonia, Latvia, and Lithuania), and Belarus.
- **Island :** British Isles, Corsica, Alba, Sardinia, Crete , Malta , Cyprus, are some of the major Islands of Europe.
- **Deserts :** Accona Desert, Bardenas Reales, Bdowska Desert, The Stone Desert, Larzac, Santorini and Anafi, Piscinas are some of the major deserts of Europe

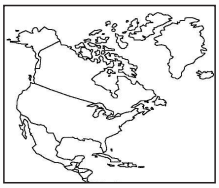
Natural Vegetation of Africa

- Sub tropical dry forest
- Subtropical Mountain Forest
- Temperate Oceanic Forest
- Temperate continental Forest
- Boreal Coniferous forest
- Boreal Tundra Forest
- Boreal Mountain

North America

North America covers about 4.8% of the planet's surface or about 16.5% of its land area, having the population of 565 million (2013) in 23 independent states. It is the third

largest continent by area, following



Asia and Africa and fourth largest in terms of population with the density of 24 million/sq km. It extends from 7o N to 85o N latitudinal-wise and longitude-wise 20oW to 179oW. It has 5 time zones.

Physical Features

Region-wise it can be classified into 5 regions which are listed below.

- **Western Region :** Young Mountains rise in the west. The most familiar of these mountains are probably the Rockies, North America's largest chain. They stretch from the province of British Columbia, Canada, to the U.S.state of New Mexico.
- **Great Plains :** In the middle of the continent lies the Grate Plain. Deep, rich soil blankets large areas of the plains in Canada and the United States. Grain grown in this region, called the "Bread basket of North America," feeding a large part of the world.
- **Canadian Shield :** The Canadian Shield is a raised but relatively flat plateau. It extends over eastern, central, and north western Canada. The Canadian Shield is characterized by a rocky landscape pocked by an astounding number of lakes.
- **Eastern Region :** This varied region includes the Appalachian Mountains and the Atlantic coastal plain. NorthAmerica's older mountain ranges, including the Appalachians, rise near the east coast of the United States and Canada
- **Caribbean Region :** The Caribbean Region includes more than 7,000 islands, islets, reefs, and cays. The region's islands and smaller islets are varied in their topography.

Natural Vegetation of Africa

- Arctic/ Tundra Forests:
- Boreal Forests/ Taiga/ Coniferous forests:
- Eastern Deciduous Forests:
- Grasslands:
- Desert Scrub:
- Mediterranean and Madrean Scrublands and Woodlands:
- Pacific Coast Coniferous Forests
- Western Montane Coniferous Forests:
- Tidal Wetlands

South America

This is a triangular shape continent, stretching from 12° N to 55°S latitude. Towards its west lies Pacific Ocean, Atlantic Ocean on the east and, North America and the Caribbean Sea lie to the northwest. It is the fourth largest continent of the world with smooth and inlet coastline.



Physical Features

Region-wise it can be classified into 5 regions which are listed below.

- **The Pacific coastal strip** lies between the west Pacific and Andes.
- **The Andes** stretches through entire continent in length running in north-south direction from Isthmus of Panama to Strait of Magellan.
- **The Central Lowland:** two great river system are covered under it namely the Amazon-Orinoco and Parana-Paraguay rivers.

- **The Eastern Highland** consists of Brazilian and Guiana Highlands along with Patagonia.

Natural Vegetation of South America

- Equatorial Forest
- Temperate Forests
- Mediterranean Forests
- Savanna Grasslands
- Pampas
- Desert

Australia

Thousands of islands combined form Oceania region, mostly covering the Central and South Pacific Ocean. The region is dominated by world's biggest island



and two other major landmasses, micro-continent of Zealandia (including New Zealand) and the western half of the island of New Guinea, made up of the nation of Papua New Guinea. Oceania also includes three island regions: Melanesia, Micronesia, and Polynesia (including the U.S. state of Hawaii). It stretches from the Strait of Malacca to the coast of Americas. Tropic of Capricorn divides it into almost two halves.

There are 28 countries and Island groups in Australasia/Oceania covering 5.3% of the Earth's land and 1.5% of the Earth's surface. The largest cities of this region includes: Jakarta, Manila, Sydney, Bandung, Melbourne, Surabaya, Medan etc.

Physical Features

Region-wise it can be classified into 3 regions such as:

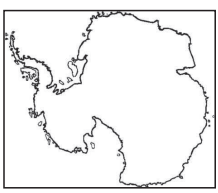
- **The great western Plateau** covers two third of Australia
- **The central lowland** extends from the shallow Gulf of Carpentaria in the north to the Southern Ocean.
- **The eastern highlands** stretch along the eastern edge of Australia, all the way from Cape York to Tasmania.

Natural Vegetation

- The tropical Rain forest
- The deciduous forest Savanna
- The dry desert and desert scrub

Antarctica

The continent of Antarctica is the fifth–largest continent in terms of geographical area, and it is situated in a remote cold



location of Southern. The continent covers approximately 20 percent of the hemisphere.

As such there are no countries in this continent except some parts of few nations such,New Zealand, Australia, France, Norway, the United Kingdom, Chile, and Argentina.

Physical Features

As a frozen continent it has only a few prominent physiographic units such as:

- **Trans – Antarctic Mountain** dividing the continent into West Antarctica and East Antarctica.
- **The Antarctic Peninsula**
- **The islands of the Antarctic** region which contains South Orkney Islands, South Shetland Islands, South Georgia, and the South Sandwich Islands, all claimed by the United Kingdom.

THINGS TO REMEMBER

CONTINENT'S HIGHEST AND LOWEST POINTS

Continent	Highest Point	Lowest Point
1. Asia	Everest (8848 m)	Dead Sea (–396.8m)
2. Africa	Kilimanjaro (5894 m)	Lake Assai (–156.1 m)
3. North America	Mckinley (6194 m)	Death Valley (–85.9 m)
4. South America	Aconcagua (6960 m)	Valdis Penin (–39.9 m)
5. Europe	Elbrus (5663 m)	Caspian Sea (–28.0 m)
6. Australia	Koscisko (2228 m)	Lake Eyre (–15.8 m)
7. Antarctica	Vinson Massif (5140 m)	(Unexplored)

HIGHEST MOUNTAIN PEAKS (WORLD)

Name	Height (in metres)	Range
1. Mount Everest	8848	Himalayas
2. K2 (Godwin Austen)	8611	Karakoram
3. Kanchenjunga	8598	Himalayas
4. Lhotse	8511	Himalayas
5. Makalu I	8481	Himalayas
6. Dhaulagiri I	8167	Himalayas
7. Manaslu I	8156	Himalayas
8. Cho Uyo	8153	Himalayas
9. Nanga Parvat	8126	Himalayas
8. Annapurana I	8091	Himalayas

THREE DEEPEST OCEANS

Name	Greatest depth (in metres)	Greatest depth location
1. Pacific Ocean	11,033	Mariana Trench
2. Atlantic Ocean	9,460	Puerto Rico Trench
3. Indian Ocean	7,542	Java Trench

SOME IMPORTANT BOUNDARY LINES

Durand Line	between Pakistan and Afghanistan
Hindenberg Line	between Germany and Poland
49th Parallel	between USA and Canada
Mac Mahon Line	between India and Tibet/China
Maginot Line	between France and Germany
38th Parallel	between North and South Korea
Oder Neisse Line	between Germany and Poland
Radcliffe Line	between India and Pakistan
17th Parallel	between India and Pakistan (as claimed by Pakistan)

LONGEST RIVERS		
Name, Nation/Continent	**Length in kms**	**Basin Area m^2km**
Nile Africa	6695	3.25
Amazon, South America	6516	6.14
Yangtze Kiang, China	6380	1.72
Mississippi Missouri, USA	5959	3.20
Ob Irtysh, Russia	5568	2.97
Yenisey Angari a Selenga, Asia	5550	2.55
Yellow (Hwang Ho), China	5464	–
Congo (Zaire), Africa	4667	–
Parana Rio de la Plata, S. Am	4500	2.58
Irtysh, Asia	4440	–
Mekong, Asia	4425	–
India		
Indus	Asia	3180
Brahmaputra	Asia	2948
Ganga-Hooghly-Padma	India	2620
Godawari	India	1465
Sutlej	India	1372
Krishna	India	1300
Narmada	India	1289
Chenab	India	1086
Ghaghara	India	1080
Shortest River		**(metres)**
Europe Ombia river, Croatia		30
North America, Roe River, Montana, USA		61
South America – Azvis River, Brazil		147

Deepest Lakes	
Baikal, Russian Fedn	1620 m
Tanganyika, Africa	1463 m
Caspian Sea, Asia-Europe	1025 m
Malawi of Nyasa, Africa	706 m
Issyk-Kul, Kyrgyzstan	702 m

LARGEST DESERTS OF THE WORLD	
Subtropical	
Sahara, North Africa	8,600,650 sq. km
Arabian, Middle East	2,300,000 sq. km
Great Victoria, Australia	647,475 sq. km
Kalahari, Southern Africa	582,727 sq. km
Chihuahuan, Mexico	453,232 sq. km
Thar, India/Pakistan	453,232 sq. km
Great Sandy, Australia	388,485 sq. km

Gibson, Australia	310,788 sq. km
Sonoran, S.W. USA	310,788 sq. km
Simpson/Stony, N Africa	145,034 sq. km
Mohave, S.W. USA	139,854 sq. km
Cool Coastal	
Atacama, Chile SA	139,854 sq. km
Namib, S.W. Africa	33,668 sq. km
Cold Winter	
Gobi, China	1,166,450 sq km
Patagonian, Argentina	673,374 sq km
Great Basin, S.W. USA	492,081 sq. km
Kara-kum, West Asia	349,636 sq. km
Colorado, Western USA, also called the Painted Desert	336,687 sq. km
Kyzyl-kum, West Asia	297,838 sq. km
Taklamakan, China	271,939 sq. km
Iranian, Iran	258,990 sq. km

DEEP-SEA TRENCHES

Name	Length	Depth	Deepest Pt.
Mariana*	2250	10.924	Challenger Deep
Tonga Kermadec (S. Pacific)	2575	10.850	Vityaz 11 (Tonga)
Kuril-Kamchatka	2250	10.542	-
Philippine	1350	10.539	Galathea Deep
Java-Indian**	2250	7725	Planet Deep

SOME IMPORTANT TRIBES AND THEIR HOME AND (WORLD)

Aleuts : Alaska
Ainus : Japan
Aeta : Phillip Cines
Bushman : Kalahari
Buryak : Central Asia
Berbers : N. Africa
Bedouin : Sahara and Middle East
Bindibu or Aborigins : Australia
Chukchi : N.E. Asia, U.S.S.R., North Siberia
Eskimos : Greenland, North Canada, Alaska, N. Siberia
Fulani : Western Africa
Gobi Mongols : Gobi
Guicas : Amazon forest area
Hausa : North Nigeria
Hotten tots : Hot tropical Africa
Ibans : Equatorial rain forest region of South-East Asia
India Tribes : Amazon basin
Koryaks : N. Siberia, Eurassian Tunda, N.E. Asia
Kalmuk : Central Asia
Kareus or Meos : Myanmar
Kirghiz : Asiatic steppes
Kazakhs : Kazakhistan
Lapps : N. Finland, Scandinavian, country
Maoris : New Zealand
Masai : East and Central Africa
Orange Asli : Malaysia
Pygmies : Congo basin, Zaire
Red Indian : N. America
Somoyeds : Siberia
Semangs : East Sumatra
Turregs : Sahara
Tapiro : Papua New Guinea
Yoakuts : Siberia
Zulus : South Africa





HISTORY

- India
- World

INDIAN HISTORY MIND MAP

ANCIENT

- Indus Valley Civilization
  - Harappa
  - Mohenjodro
  - Chanhu-daro
  - Kalibangan
  - Lothal
  - Banawali
  - Amri
  - Dholavira
  - Rangpur
  - Ropar
  - Alamgirpur
- Vedic Period/ Aryan
- Jainism & Buddhism
- Mahajanpad
- Magadh Empire
- Maurya Dynasty
- Sunga Dynasty
- Satyahana dynasty
- Kushan Dynasty
- Gupta Empire
- Reign of Harshvardhan
- Pala Empire
- Southern Kingdoms
  - Pallav
  - Chalukya
  - Chola Dynasty

MEDIEVAL

- Delhi Sultanate
- Vijayanagar Empire
- Religious movement in India
- Bhakti & Sufi Movement
- Mughal Dynasty
- Advent of European Commerce
  - The Portuguese
  - The Dutch
  - The French
- Kingdom of Great Marathas

MODERN

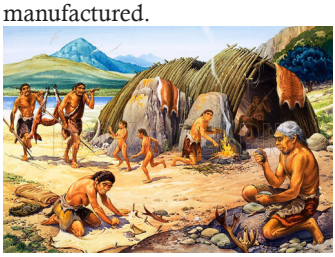
- Trade Initiation of British
- Establishment of British in India Company in 1600 Ad
- India under British Rule before 1857
- Indian Rebellion against British in 1857 (Sepoy Mutiny)
- Freedom Struggle of India
- Major Events of Indian Freedom struggle
  - Rowlatt Act (1919)
  - Jallianwala Bagh Massacre(1919)
  - Chauri Chaura Incident(1922)
  - Non Cooperation Movement(1920-22)
  - Civil Disobedience Movement or Satyagraha(1930)
  - Quit-India Movement (1942)
  - Azad Hind Fauz (1943)
  - Partition of India and formation of a new country Pakistan (1947)
  - India got Independence(1947)
  - End of Drafting of Indian Constitution on 26 November 1949
  - The Indian Constitution came into effect on 26th Jan, 1950

ANCIENT INDIA

Pre Historic Ages

Stone Age

- Pre - historic period is divided into three sections- Stone age, Bronze age and Iron age
- Stone age is divided into three periods i.e., Palaeolithic Age, Mesolithic Age and Neolithic Age.
- **Lower Palaeolithic Age** covers the greater part of the Ice Age.
- Its people used to eat fruits, birds and raw animal flesh etc.
- The tools were usually made of hard rock.
- In **Middle Palaeolithic age** a bit change occurred in the shape of tools made of stones or bones.
- In **Upper Palaeolithic age**, human lived as nomadic hunter gatherers.
- **Mesolithic Age** was an intermediate stage in the stone age. It ended with the introduction of agriculture.
- **Neolithic age** was an age of polished tool culture.
- Tool making became an important profession and a variety of polished tools were manufactured.

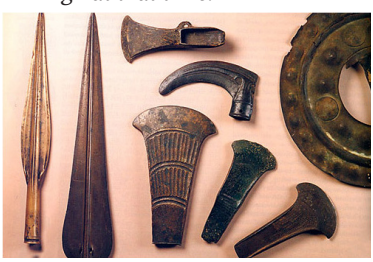


- They learnt the art of pottery and their pots were well made and decorated with paintings.
- They discovered the art of producing fire by the friction of stones and the wheel was also an important discovery of this age.

Bronze Age

It began with the development of Indus valley civilization around 3000 BC and continued up to 1300 BC.

- People started using weapons and agricultural tools made of Bronze, an alloy of copper and tin.
- It had opened the trade networks of Mesopotamia civilization to reach out in various directions.
- The age came to an end primarily because of the fact that the metals used as alloy in manufacturing bronze were not very common and widely found. More over the expenses of making bronze were high at that time.



Iron Age

- It was the last principal period among the three-age system of prehistoric societies, preceded by the Bronze age.
- The development of this era was due to the fact that people started using weapons and tools made by iron marked by other prominent changes in the society such as agricultural practices, religious belief and inclinations towards art.
- The age began in the 6th century BCE in northern Europe and 8th century BCE in central Europe

followed by12th century BCE in the ancient Near East, ancient Iran, ancient India, and ancient Greece.

- In India the late Harappan Culture was marked with the Iron Age archaeological cultures of India with emphasis given on the Painted Grey Ware culture (1200 to 600 BCE) and the Northern Black Polished Ware (700 to 200 BCE).



Indus Valley Civilization

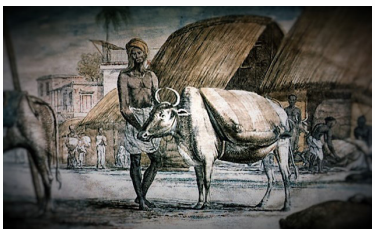
Indus Valley Civilization was the most ancient urban civilization in this world which flourished on the bank of Indus River during Bronze Age Period. The important cities under this civilizations were given below.

IMPORTANT SITES

Name of Sites	Year of Excavation	Excavators	Region/River	Features
Harappa	1921	Daya Ram Sahni	Montgomery district of Punjab (Now in Pak) on the left bank of Ravi	1. City followed grid planning
				2. Row of six granaries
				3. Only place having evidences of coffin burial
				4. Evidence of fractional burial and coffin burial
				5. Cemetery-H of alien people.
Mohenjodaro	1922	R.D. Banarjee	Larkana district in Sind on the right bank of Indus (Now in Pak)	1. City followed grid planning
				2. A large granary and Great Bath, a college
				3. Human skeletons showing invasiona and massacre.
				4. Evidence of Horse come from superficial level.
				5. A piece of woven cotton alongwith spindle whorls and needles
				6. Town was flooded more then seven times.
Chanhu-daro	1931	N. Gopal Majumdar, Mackey	Situtated in Sind on the bank of Indus	1. The city has no citadal
				2. Famous for bead makers shop
				3. A small pot, possibly an inkpot
				4. Foot prints of a dog chasing a cat
				5. Three different cultural layers, Indus, Jhukar and Jhangar

Kalibangan	1953	A. Ghosh	Situated in Rajasthan on the Bank of Ghaggar	1. Shows both Pre Harappan and Harappan phase
				2. Evidence of furrowed land
				3. Evidence of seven fire altars and camel bones
				4. Many houses had their own well
				5. Kalibangan stand for black bangles
				6. Evidence of wooden furrow
Lothal	1953	S.R. Rao	Situated in Gujarat on Bhogava river near Gulf of Cambay	1. A titled floor which bears intersecting design of circles
				2. Remains of rice husk
				3. Evidence of horse from a terracotta figurine
				4. A ship designed on a seal
				5. Beads & trade ports
				6. An instrument for measuring angles,pointing to modern day compass
Banwali	1974	R.S. Bisht	Situated in Hissar district of Haryana	1. Shows both Pre-Harappan and Harppan phase
				2. Good quantity of barley found here
Amri	1935	N.G. Majumdar	Situated in Sind on the bank of Indus	1. Evidence of antelope
Dholavira	1985-90	R.S. Bisht	Situated in Gujarat in Rann of Kutch	1. Seven cultural stages
				2. Largest site
				3. Three party of city
				4. Unique water management
Rangpur	1953	M.S. Vats, B.B. Lal & S.R. Rao	Situated on the bank of Mahar in Gujarat	1. Rice was cultivated
Ropar	1953	Y.D. Sharma	Situated in Punjab of the banks of Sutlej	1. Evidence of burying a dog below the human bural
				2. One example of rectangular mudbrick chamber was noticed
				3. Five fold cultures - Harappan, PGW, NBP, Kushana - Gupta and Medieval
Alamgirpur	1958	Y . D . Sharma	Situated on Hindon in Ghaziabad	1. The impression of cloth on a trough is discovered 2. Usually considered to be the eastern boundary of the Indus culture

Early Vedic period/ Aryan (c. 1500–500 BCE)



- The earliest specimen of Indo-European language is Rig Veda. Aryans were the people who spoke Indo-European languages basically belonging to Central Asia, migrated to India.
- They settled themselves in Sapta Sindhu the land of seven rivers in north-western region of India which included Kubha river of Afghanistan along with Indus and its five tributaries.
- According to the oldest Vedic literature (Rig Veda) the Aryan king came into conflict with Dasa (branch of early Aryans) and Dasyus (original inhabitants of the country). They were soft to Dasas but strongly hostile to Dasyus.
- Gradually the region came to be known as Bharatavarsha named after the tribe Bharata. This clan consists of 5 Aryan chiefs and 5 non-Aryan chiefs. Dasrajna Yudha or Battle of ten Kings has been mentioned in hymns of Rig Veda.
- The battle of ten kings was between Sudas, Bharata king of Tritsu family (belonging to Aryan clan) and ten well-know tribes ---Puru, Yadu, Turvasa, Anu, Druhyu, Alina, Parktha, Bhalanas, Shiva and Vishanin. The battle was fought on the bank of river Parusni, identical to river Ravi and was won by Bharatas.
- Kurus were the ruling tribe which was formed after this battle, when Bharatas joined hands with Purus (most important tribe among defeated tribes).
- Samgrama meant that gram clashed with one another and caused war.
- The Aryans were pastoral people and fought most of the war for it. Rig Veda is "gavisihthi" or search for cows as they were the most important form of wealth.
- The concept of women slave was most common. Women and cows were gifted to the priests in those days.
- Voluntary offering to the chief was known as bali.
- Two priests who played important role during this time were Vasishtha and Vishvamitra.
- The people of Vedic period were theists. Vedic literature shows the existence of god and some invincible powers. Atharvaveda time or Kala has been described as the originator of everything. Vedic people worshipped many gods not out of fear but for gaining their favours. The religion of the Vedic Aryan worshipped nature with one in many concepts.
- **Indra** (rain god) was important as he played role of a warlord. 250 hymns were devoted to him. **Agni** (fire god) was devoted 200 hymns. **Varuna**, **Soma** (plant god), female divinities like **Aditi** and **Usha** were also worshipprd but were not given importance as the male gods.

- The administrative machinery worked under tribal chief called as Rajans. Clan based assemblies were found such as sabha, samiti, vidatha, gana. Saba and samiti were most important to the chief as the places of wining support. Women attended sabha and vidatha.
- Social structure of the society was based on the kinship. Common term for nephew, grandson and cousin was **naptri**.

Later Vedic Period

- The hymns or mantras were known as Samhitas. Rig Veda text were tune and its modified collection was known as **Sama Veda Samhita**. Two other collections were added in Sama Veda during post Rig Vedic time. These were – The **Yajur Veda Samhita** and the **Atharva Veda Samhita**.



Later Vedic Period

- **Rig Veda** contained 1017 hymns and was divided into ten mandalas. The first and tenth hymns are said to be added later as their language differ from other eight mandalas. It's the tenth mandala which explains the four varnas.
- **Sama Veda** consist of 1603 verses and after 99 all the rest have been borrowed from Rig Vedas.
- **Yajur Veda Samhita** contains not only hymns but also rituals which have to accompany their recitation.
- **Atharva Veda Samhita** contains charms and spells to ward off evil and diseases.
- All these were complied in the upper Ganga basin in circa 1000-600 B.C.

Jainism

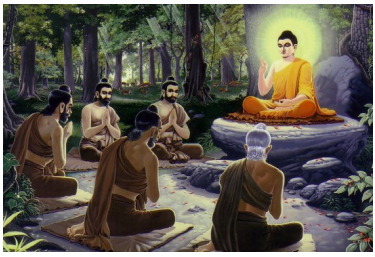
- Mahavira (540-468 B.C.) was born in Kundagrama village, of Muzzafarpur, Bihar. He belonged to Jnatrika clan and Trishal clan from his father's and mother's side respectively. At the age of 30 he gave up his crown and became an ascetic. He attained the supreme knowledge after thirteenth year of his asceticism outside the town of Jrimbhikgrama. Then on he was called as Jaina or Jitendriya (one who conquered his senses), Nragrantha (free from all bonds) and Mahavira (the brave). His teaching included:
- He advocated an austere and simple life with the aim of Kaivalya.
- He believed that the universe was the product of nature— outcome of cause and effect; Karma and transmigration of soul. Atma (soul) is eternal and is born and reborn. Ultimate aim of the jiva (conscious) should be getting rid of the birth cycle.
- He laid great stress on equality.
- Five vows includes: Ahimsa (non-violence), Satya, Asateya (non-stealing), Aparigraha (non-possession) and Brahmacharya.
- Jains devotees were categorized as a) Tirthankara b) Arhat c) Acharya d) Upadhyaya and e) Sadhu.
- There are two sect of Jainism: Digambara and Shvetambara.



Buddhism

Gautama Buddha was the founder of Buddhism. He was a prince in the kingdom of Kapilavastu in 563 B.C. At the age of 29 he left his home in search of enlightenment, which he attained at the age of 35 at Bodh Gaya under the peepal tree. He delivered his first sermon at Sarnath, Banaras. He passed away at the age of 80 (483 B.C.) at Kushinaga. He recommended an eight fold path (ashtangika marga) which included right observation, right determination, right speech, right action, right livelihood, right exercise, right memory and right meditation.

During first century A.D. image of Buddha was developed in Greek and Indian form which created a new form of art called as **Gandhara Art**.



Mahajanapadas

During the age of Buddha whole of northern territory especially north of Vindyan was divided into sixteen states called Sodasha Mahajanapadas either monarchical or republican in character. The kingdoms of Magadh, Koshala, Vatsa and Avanti were considered powerful. Buddhist literature "Anguttara Nikaya" listed them as:

Mahajanapadas	Capital	Present place
Gandhara	Taxila	A part of Afghanistan
Kamboja	Rajauri	Part of Kashmir and Afghanistan
Asmaka	Potana	Godavari Valley
Vatsa	Kaushambi	Allahabad
Avanti	Ujjain	Malwa and a part of M.P
Surasena	Mathura	Mathura in U.P
Chedi	Shuktimati	Bundelkhand in M.P
Malla	Kushinara, Pawa	Eastern U.P
Kurus	Hstinapur/Indraprashta	Delhi and Meerut
Matasya	Virat Nagari	Jaipur and Alwar
Vajjis	Vaishali	North Bihar
Anga	Champa	Bhagalpur and Monghyr in Bihar
Kashi	Banaras	Banaras
Kosala	Shravasti	Oudh in U.P
Magadha	Girivraja/Rajgriha	Patna and Gaya in Bihar
Panchala	Ahichhatra/Kampilya	Rohilkhand in U.P

Magadha Empire

Magadha roughly represents the present Patna and Gaya districts of Bihar. It was situated between the Ganga (north), Son (west), Vindhyan range (south) and Champa (east). Its earliest capital was Girivraja (Now Rajagriha). King Bimbisara was the founder of this empire.

Three dynasties ruled over Magadha are as follow:

- **The Haryanaka Dynasty** (544-412 BC) : Bimbisara was the first ruler (544 B.C.-492 B.C.) and founder of Haryanka dynasty. He was contemporary to Buddha and located his capital at Rajgir (Girivraja). He strengthened his empire by conquest and aggression even using matrimonial alliances for this purpose. He had three wives: daughter of the king Kosala, Chellana (Lichhavi Princess) and daughter of the chief of the Madra clan of Punjab. Bimbisara sent Jivaka to Ujjain for the treatment of King Pradyota, (king of Avanti). He was killed and succeeded by his son Ajatasatru. He built the fort upon the confluence of the Ganga and Son at Patna. He shifted his capital from the Rajgir to Pataliputra. Ajatasatru was killed by his son Udayin.
- **Shishunaga Dynasty** (412-344 BC) : The last Haryanka ruler, Nagadasaka killed by his courtier Shishunaga in 430 B.C. thus becoming the king and founded Shishunaga dynasty. He was succeeded by his son Kalashoka who organized the second Buddhist Council at Vaishali in 383 B.C. The last ruler of Shishunaga dynasty was Nandivardhan.
- **Nanda Dynasty** (344-321 BC): Mahapadma Nanda established the Nanda dynasty. They had a huge army of 2, 00,000 infantry, 60,000 cavalry and 2,000 war chariots and 6,000 war elephants. Dhanananda was the last ruler of this dynasty. He was contemporary of Alexander, who invaded India in 326 B.C. during his reign.

Mauryan Empire (322–185 B.C)

Rulers of Mauryan Dynasty: Chandragupta Maurya (322 BC-298 BC); Bindusara (298 BC-272 BC); Ashoka (274 BC-232 BC) Dasaratha (232 BC-224 BC); Samprati (224 BC-215 BC) Salisuka (215 BC-202 BC); Devavarman (202 BC-195 BC); Satadhanvan (195 BC-187 BC); Brihadatha (187 BC-185 BC).

- Chandragupta Maurya defeated Dhanananda with the help of Chanakya.
- Greek and Latin name of Chandragupta was Sandracottos" or " ndracottus.
- Megasthenes was the ambassador sent by Seleucus.
- Chandragupta Maurya was succeeded by his son Bindusara. Greek sources refer him as Amitrochates or amitraghata (destroyer of foes) in Sanskrit.
- Ashoka was the son of Bindusara, who fought the battle of Kalinga in 261B.C. The scene of mass death of battle altered his mind and thus became the follower of Buddhism. Ashok Stambh at sarnath was adopted as national emblem of India. Ashoka built Dhamek Stupa (Sarnath, Uttar Pradesh), Bharhut stupa (Madhya Pradesh), Mahabodhi Temple (Bihar).
- Last Mauryan King was Brihadratha (Killed by his general Pushyamitra). Pushyamitra founded Sunga Dynasty.

Sunga Dynasty (185 to 73 B.C.)

Rulers of Sunga Dynasty: Pushyamitra Sunga, Agnimitra, Vasujyeshtha, Vasumitra, Andhraka Pulindaka, Ghosha, Vajramitra, Bhagabhadra, Devabhuti.

- Pushyamitra Sunga was the senapati of last king of Mauryan Empire Brihadratha. He killed Brihadratha and founded the Sunga dynasty in 185 B.C. The kingdom extended upto eastern Punjab.



- It was a Magadha dynasty and its capital was Pataliputra but later Vidhisha was the capital of Sunga rulers.
- Patanjali (grammarian of Sanskrit) was patronized by Pushyamitra Sunga. They performed vedic sacrifices trying to bring back Brahmanical way of life.
- Other Sunga Rulers are Bhumimitra, Narayana, Susarman. Susarman was put to death by Satavahana ruler.
- They were succeeded by **Kanva dynasty**: Vasudeva Kanva was the founder of Kanva dynasty. He was a Brahmin and follower of lord Vishnu.

Satvahana dynasty (167–196 AD)

Simuka was the founder of this dynasty. It was situated between the region of Krishna and Godavari rivers. Most powerful king of the dynasty was Gautamiputra Satakarni (A.D. 106-130). He defeated the Sakas, Yavanas (Greeks) and Pahlavas (Parithans).

Kushan dynasty (30–375 AD)

Kanishka was the greatest ruler of this dynasty and is known for his military powers. The Capital of Kushans is Purushpura (Peshawar). Kanishka is considered to have conflicted with the Pataliputra. He was a patron of Buddhism and convened the 4th Buddhist council in the Kundalvana of Kashmir in 78 AD. Scholars in the Court of Kanishka were Parsva, Vasumitra, Asvaghosa, Nagarjuna, Charaka and Mathara. Sushruta who wrote Sushruta Samhita, has also been connected to Kanishka.

The Gupta Empire (320-550AD)

This period is known as Golden Era

- **Chandragupta I** (319-335 AD) – was the founder and an important ruler of the Gupta dynasty. He married to Kumaradevi princess of lichchhavi in order to strengthen his position.
- **Samudragupta** (335-380 A.D.) expanded the kingdom as he was very much delighted in violence. The poet in his court "Harishena" in his works Prayag and Prashasti have described glowing account of the military exploits of the patron. Thus was known as "Indian Napoleon".



- **Chandragupta II** succeeded Samundragupta. Extended his empire by marriage alliances and conquers. He married his daughter Prabhavati with a Vakataka prince who belonged to the Brahmana caste and ruled in central India. He patronized the famous Nav Ratan. Kalidasa and Amarasimha were among them. He conquered western Malwa and Gujarat, ruled by the Saka Kshatrapas for about past four centuries and adopted the title of Vikramaditya after conquering Ujjain. Chinese pilgrim Fa-hsien came to India during his reign.
- His son Kumaragupta succeeded him. Kumaragupta's dominion suffered severely from the invasion of Huna Hordes, all over North India. Skandagupta son of Kumaragupt defeated Pushyamitra who became powerful during Kumaragupta time. He also defeated the White Hunas.
- Nalanda University was built by Kumargupt.
- The great Mathematician Aryabhata lived during this period. He discovered the number "0" and value of Pi. He wrote "Aryabhatiya" and "Suryasiddhanta.
- Poets Kalidasa, Dandi, Visakhadatta, Shudraka, and Bharavi, all belonged to the Gupta Age.
- Tamralipti, a port in Bengal , was an important trade centre during Gupta period
- The empire was divided into divisions: bhuktis (under the charge of an uparika) and vishayas (Districts) under the charge of vishyapati.

Harshavardhana (606-647 A.D.)

- Fall of Gupta's and Humu invasion left northern India in a disorder and chaotic situation. It gave rise to small kingdoms and Thaneswar, near Kurukshetra under the leadership of Prabhakarvardhana and his son Harsha.
- He made Kanauj his capital and his kingdom spread over northern India except Kashmir.
- Banabhatta was a poet in his court who wrote Harshacharita describing early history of his reign.
- Chinese pilgrim Hsuan Tsang who visited India during his reign has thrown great deal of light on the administrative, political and social life of that time. He spent his six years of life in India (606-612 A.D.).
- Harsha himself wrote the Ratnavali, Naganandam and Priyadarshika plays in Sanskrit.

The Pala Empire (750–1174 B.C.) Golden era of Bengal



- It was Buddhist dynasty from Bengal founded by Gopala I. The empire reached its peak under Dharmapala and Devapala. Dharmapala conquered Kanauj and extended his sway up to the farthest limits of India in the northwest.

- Palas were followers of the Mahayana and Tantric schools of Buddhism, they also patronised Shaivism and Vaishnavism.
- Dharmapala founded the Vikramashila and revived Nalanda. Nalanda reached its height under the patronage of the Pala Empire. The Palas also built many viharas. They maintained close cultural and commercial ties with countries of Southeast Asia and Tibet. Sea trade added greatly to the prosperity of the Pala kingdom. The Arab merchant Suleiman notes the enormity of the Pala army in his memoirs.

Southern Kingdoms

- The Pallavas of Kanchi, the Chalukyas of Badami and the Pandyas of Madurai emerged as powerful states in southern India in the beginning of seven century.
- Pallavas constructed temples of Shiva and Vishnu in Tamil Nadu.
- Epigraphs found in Andhra and Karnataka between second and third century B.C. were mostly written in Prakrit but around 400 A.D. Sanskrit became official language.
- Pallavas ruled over southern Andhra and northern Tamil Nadu. Made Kanchi their capital identical to present Kanchipuram and made it a city of temple and vedic learning.
- The Chalukyas setup their sovereign state at Vatapi (modern Bijapur district). Pulakesin I (543-567 A.D.) established this dynasty and Pulakesin II (608-647) was greatest of all rulers.
- Well known Kasivisvesvara Temple at Lakkundi, the Mallikarjuna Temple at Kuruvatti, the Kallesvara Temple at Bagali and the Mahadeva Temple at Itagi were built during Chalukyas reign.
- The Pallavas and Chalukyas were in conflict during Pulakesin II. Narasimhavarman captured his capital during their second clash between the two. Narasimhavarman then assumed the title of vatapikonda (conquer of Vatapi).

Chola Dynasty

Vijayalaya was the founder of Chola Dynasty. Most powerful kings of Chola Dynasty was Rajaraja (985-1014) and his son, Rajendra I. Rajendra I founded a new capital of Gangai Kondacholapuram. He defeated the kings of Sumatra in a naval campaign and annexed a part of Sumarata kingdom to his kingdom. Rajendra Chola III was the last king of the dynasty. Under the Cholas, the South India reached new heights of excellence in art, religion and literature.

MEDIEVAL HISTORY

Delhi Sultanate

Delhi sultanate begins with Turkish invasion in India by Muhammad Ghori in1173 to 1202. He nominated his faithful slave Qutubbudin Aibak as the governor of the newly possessed region called India. During this period Delhi became the centre of Turkish and Afghan Power.

Dynasty	Sultan / Agent	Event Highlights
Mamluk (1193-1290)	• Qutb-ud-din Aibak (1206–1210) • Aram Shah (1210–1211) • Shams ud din Iltutmish (1211–1236), • Rukn ud din Firuz (1236) • Raziyyat-ud-din Sultana (1236–1240) • Muiz ud din Bahram (1240–1242) • Alaud din Masud (1242–1246), • Nasir uddin Mahmud (1246–1266), • Ghiyas uddin Balban (1266–1286), • Muiz uddin Qaiqabad (1286–1290),	• Construction of world famous monument **Qutub Minar** by Qutb-ud-din Aibak and finished by his successors. They have also attacked temples of Ajmer, Samana, Kuhram, Delhi, Kol, Benaras
Khilji (1290-1320)	• Jalal ud din Firuz Khilji (1290–1296) • Alauddin Khilji (1296–1316) • Umar Khan Khilji (1316) • Qutb ud din Mubarak Shah (1316-1320) • Khusro Khan (1320)	• Known for their cruelty as they levied taxes on the defeated community. During the period of Alauddin Khilji the famous Koh-i-noor Diamond of Warangal was looted somewhere around 1310
Tughluq (1320-1395)	• Ghiyath al-Din Tughluq (1320-1325) • Muhammad bin Tughluq (1325-1351) • Mahmud Ibn Muhammad (March 1351) • Firuz Shah Tughluq (1351–1388) • Ghiyas-ud-Din Tughlaq II (1388–1389) • Abu Bakr Shah (1389–1390) • Nasir ud din Muhammad Shah III (1390–1393) • Sikander Shah I (March-April 1393) • Nasir-ud-Din Mahmud Shah Tughluq (1393–1413) • Nasir-ud-din Nusrat Shah Tughluq (1394–1414),	• Geographically the largest dynasty; Muhammad bin Tughluq one of the powerful sultans changed the capital from Delhi to Daulatabad (present Deogir in Maharashtra) to rule the empire more proficiently thus ordered for forceful migration of common masses. Though a good idea but he failed to execute. • Secondly his ideas to introduce bronze coin instead of silver coin also failed as the bronze coins were easy to forge
Sayyid (1400-1442)	• Khizr Khan (1414–1421) • Mubarak Shah (1421–1434) • Muhammad Shah (1434–1445) • Alam Shah (1445–1451)	• The vast Tughlaq dynasty shrunk within 10 miles of Delhi during this period.

Lodi (1457-1518)	• Bahlul Lodi (1451–1489) • Sikandar Lodi (1489–1517) • Ibrahim Lodi (1517–1526),	• The dynasty had fought one of the greatest battles in India- Battle of Panipat in 1526 with Babur who was invited by Daulat Khan Lodi to enter India and at the end Ibrahim Lodi lost the battle

Vijayanagara Empire

Dynasty	Emperors	Important Highlights
Sangama Dynasty	• Harihara Raya I(1336–1356) • Bukka Raya I (1356–1377) • Harihara Raya II (1377–1404) • Virupaksha Raya (1404–1405) • Bukka Raya II (1405–1406) • Deva Raya I (1406–1422) • Ramachandra Raya(1422) • Vira Vijaya Bukka Raya (1422–1424) • Deva Raya II (1424–1446) • Mallikarjuna Raya (1446–1465) • Virupaksha Raya II (1465–1485) • Praudha Raya(1485)	• The rise of Vijayanagar dynasty was the result of political and cultural movement against the Tughlaqs. • Presumably Harihar I and Bukka I were the founders of this dynasty. • This dynasty had to face the invasion from Bhamani Sultan Ahmed Lin. • The kings of this dynasty were generous and worked for the social welfare of the people. • Some of the kings were great patronage of literature.
Saluva Dynasty	• Saluva Narasimha Deva Raya (1485–1491) • Thimma Bhupala(1491) • Narasimha Raya II(1491–1505)	• The Saluva started ruling soon after Saluva Narasimha had a fight with the Sambetas of Peranipadu and the Paligers of Ummattur but they couldn't sustain power for a very long period
Tuluva Dynasty	• Tuluva Narasa Nayaka (1491–1503) • Vira Narasimha Raya (1503–1509) • Krishna Deva Raya (1509–1529) • Achyuta Deva Raya (1529–1542)	• Founded by Tuluva Narasa Nayak, the third Hindu dynasty of Vijayanagar Empire seemed to be the most powerful dynasties. • Krishan Deva Raya the most powerful king of this dynasty.
Aravidu Dynasty	• Venkata I 1542 • Sadasiva Raya (1542–1570)	• Believed to be the golden period of Telugu literature • Worshipped Nagaraja Vasuki hence called as Nagavanshis

	• Aliya Rama Raya 1542–1565 • Tirumala Deva Raya 1565–1572 • Sriranga I 1572–1586 • Venkata II 1586–1614 • Sriranga II 1614 • Rama Deva Raya 1617–1632 • Venkata III 1632–1642 • Sriranga III	• The last dynasty of Vijayanagar empire founded by Tirumal Deva Raya • The battle of Raksa –Tangadi happened hence the Aravidu dynasty as well as Vijayanagar empire came to an end by the combined forces of Bijapur muslims

Religious Movement

During fifteenth and sixteenth century religious movements have emerged in India so as to liberate people from dogmatic beliefs, ritualism, caste and communal hatred etc. Two major movements that carried out juxtaposing by both Hindu and Muslim communities were Bhakti and Sufi Movement.

Bhakti Movement

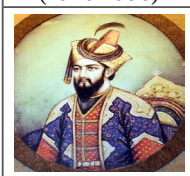
- **Bhakti** means personal devotion to God. It stresses the Union of the individual with God.
- **Bhakti movement** originated in South India between the 15th and the 17th centuries AD.
- The **Nayanars**, who worshipped Siva, and the Alwars, who worshipped Vishnu, preached the idea of Bhakti
- Saints like Sankara, Ramanuja and Madhwa gave their concepts of God and the individual soul.
- Teachings of Ramanuja were based on the Upanishads and Bhagwad Gita.
- **Ramananda** was disciple of Ramunaja. He was the first reformer to preach in Hindi.
- **Kabir** was an ardent disciple of Ramananda. He wanted unity between the Hindus and the Muslims
- He preached that both the Hindus and the Muslims are the children of a single God.
- The devotees of Kabir were known as Kabir Panthis.
- **Namdeva** was a waterman by birth. He composed beautiful hymns in Marathi.
- **Nanak** was the founder of the Sikh religion.
- Nanak's teachings were in the form of verses. They were collected in a book called the Adi Granth.
- Later Adi Grantham was written in a script called Gurmukhi.
- **Chaitaniya**, a great devotee of Lord Krishna, was a saint from Bengal.
- **Meerabai** was a Rajput princess. She married the Rana of Mewar. She was a pious devotee of Lord Krishna.
- **Chatrapati Shivaji**, the great Maratha ruler, was a follower of Ramdas.
- **Tukaram** was a saint who lived in Maharashtra. He composed a large number of verses called Abhangas
- **Tulsidas** composed the famous Ramcharitamanas in Hindi, expounding the various aspects of Hindu dharma.
- **Surdas** was a devotee of Lord Krishna and Radha. His works include Sursagar, Sahitya Ratna and Sur Sarawali.
- **Dadu Dayal** was a disciple of Kabir. His followers were known as Dadu Panthis.

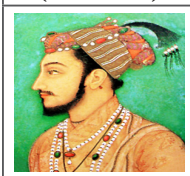
- **Eknath** was a devotee of Vithoba. He wrote commentary on verses of the Bhagavad Gita.

The Sufi Movement

- **Sufism** is basically a religion based on the truth of life. The mystics of Islam are called Sufis.
- The founders of the most important Sufi lineage Chisti, Suhrawardi, Qadiri, Naqshbandi originally came from central and west Asia.
- The prominent sufi saints were Khwaja Nizamuddin Aulia, Ganj-e-Shakar Fariduddin, Qutubuddin Bakhtiyar Kaki and Hamuddin Nagori .
- **Hazrat Nizam-ud-Din** was the disciple of Fariduddin Ganj-i-Shakkar.
- **Qutbuddin Bakhtiar Kaki** was the disciple and the spiritual successor of Moinuddin Chishti.

MUGHAL DYNASTY

Sultans	Important accomplishments
 **Babur** (1526-1530)	• Babur won Delhi sultanate by defeating the last king of Lodhi dynasty. • Two major battles won by Babur were Battle of Panipat I (April 1526) and Khanwa Battle (March 1527) • Continued to conquer places in the coming years and his territory extended almost up to the northern part of India.
 **Humayun** (1530-1556)	• Came to power soon after the death of his father Babur in 1530. • Forcefully driven to Afghanistan by the Muslim rebel Sher Shah and returned to India after twelve years. • Encouraged Persian artists for their fine arts; brought two of them from the school of Bihzad to teach Akbar, the lessons of drawing. • Died accidentally by falling down from stone stair case
 **Akbar** (1556-1605)	• Ruled from 1555 till his death. • His power influenced entire country because of the dominance of Mughal military, politics, culture and economy. • Was quite different from other mughal emperors in terms of his liberal behaviour with the society, religious practices and administrative policies • Abolished pilgrimage tax which the common people had to pay while visiting to pilgrim spots • Rajputs were made equal partners in government. • Driven by the thought of religious equality, formulated his own religion Din-i-Ilahi which focused on universal harmony. • His great passion about knowledge made him appoint intellectual people in his court and name them as Navratna.

 **Jahangir** (1605-1627)	• The only heir survived and ruled the mughal dynasty after Akbar. • First military expedition was against Rana Amar Singh, son of Rana Pratap of Mewar. • Art, literature, and architecture prospered under Jahangir's rule, and the Mughal gardens in Srinagar remain an enduring testimony to his artistic taste.
 **Shahjahan** (1628-1658)	• The fifth ruler of Mughal dynasty and famous for his great administration • Not liberal for other religions like Akbar, ordered to abolish the churches and temples of the then society. • As a great lover of art and culture took interest in the construction and architecture and the master piece is Taj Mahal built in the memory of his beloved wife Mumtaz Mahal
 **Aurangzeb** (1658-1707)	• Started ruling the dynasty as its sixth emperor. • Was a ruler with religious orthodoxy and used to support Islam • Was not much passionate about art and culture, so during his tenure only few monuments have been developed - gateway of the Red Fort and the exquisite Moti (Pearl) Mosque at Delhi. • Reintroduced Jaziya i.e. taxation on non-muslims.

Advent of European Commerce in India

The Portuguese

Vasco de Gama discovered new sea route to India via coast of South Africa and reached Calicut coast on 20th May 1498 and established factories at Cochin. Successively Francis co de Almeida reached India in September 1505 and became the Portuguese governor in India. He built a fort and settled there and named it as Anjadiav. Like him his other successors continued the same practice of building forts and expanding their territory from Malabar port in South to the northern ports of Gujarat. The territory of Portugal was based on the command of the sea and the possession of ports along the sea coast.

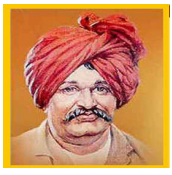
The Dutch

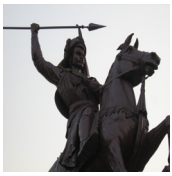
The first Dutch expedition reached East Indies under the leadership Cornelius Houtman in the year1565. The expedition aimed at opening spice roots to India. However, in between 1595 to 1601 several such expeditions were made to monopolize the entire spice trade to Europe with their skill administration and vigour commercialization.

The French

The very first attempt of the French community to enter Indian coast was in the early days of sixteenth century but they failed to do so due to the monopoly of Dutch Territory. Later on they discovered land routes through Asia minors under the guidance of Richelieu. They were permitted to sail to Madagascar and the neighbouring islands and establish colonies and trade there.

THE KINGDOM OF THE GREAT MARATHA

Eminent Persons	Notable accomplishments
 **Shivaji Bhonsle** (1630-80 A.D)	• Known as the father of Maratha nation, • Before killing Adilshahi general Afzal Khan in 1647, he gradually started capturing forts in the region like Purandar, Rajgad, Torna. • The guerrilla tactics and brilliant military strategies was his key to success in every war • Fought with Jai Singh, general of Aurangzeb in which he lost and arrested in 1666, but soon he escaped and regained his lost territory • Assumed the title of "Chhatrapati" at his elaborate coronation in 1674. • Died in 1680 and at that time had control over most of western Maharashtra and had made 'Raigad' capital.
 **Sambhaji**	• Was the first son of Chhatrapati Shivaji and succeeded his father after his death in the first week of April 1680. • Gave shelter to Sultan Muhammad Akbar, the fourth son of Aurangzeb, who sought Sambhaji's aid in winning the Mughal throne from his emperor father. • During this period Mughals sieged the Maratha fort of Ramsej in 1682, but after five months of failed attempts, including planting explosive mines and building wooden towers to gain the walls, the Mughal siege failed. • Was imprisoned and executed by Aurangzeb, in 1689
 **Rajaram**	• After the execution of Shambhaji, Rajaram, the second son of Shivaji had taken the charge of Marathas in 1689 but soon died in 1700. • Tarabai the widow of Rajaram, put her young son Sambhaji II on the throne after his father's death, at the tender age of ten, and continued the fight against Mughals until the death of Aurangzeb in 1707.
 **Sahuji**	• Sahuji the son of Sambhaji was released from Mughals captivity in 1707. • He attacked Tarabai and Sambhaji II from the throne of Maratha with the help of Peshwa Balaji Biswanathan and won the battle. Soon had his own territory. • Didn't posses a strong affinity towards politics he settled down in Satara.

 **Balaji Vishwanath**	• He was appointed as Prime Minister of Sahuji and assisted him on political issues. • This was the beginning of another great dynasty in 1718 known as Peshwa dynasty. • He was died in 1721.
 **Bajirao Peshwa I**	• As the eldest son to his father Balaji Vishwanath, Bajirao Peshwa I took the charge of Peshwa dynasty after his death in 1721. • During his tenure, Pune regained the status of capital Maratha Kingdom from Raigad. • In 1734, captured the Malwa territory in the north, and in 1739, drove out the Portuguese from nearly all their possessions in the Western Ghats. • He was died in 1740.
 **Balaji Bajirao (Nanasaheb)**	• Succeeded as Peshwa after his father Bajirao Peshwa's Death. • Fought the third war of Panipat with Ahmad Shah Abdalli in 1761 but lost the war. • Was shattered by the loss of his elder son and brother in the war and died soon after the war ended.
 **Madhav Rao**	• Assumed the title of Peshwa in 1761. • His leading achievements included the defeat of Nizam of Hyderabad, Hyder Ali of Mysore and Bhosle of Nagpur. • Defeated Jats and took the hold of Agra and Mathura in 1769 with the help of Mahadaji Shinde and Nana Phadnis. • In 1772, died at an early age of 27 years.
 **Mahadaji Shinde**	• Was a trusted lieutenant of the Peshwa and one of the three pillars of Maratha Resurrection • Wiped out the power of Jats of Mathura and during 1772-73 and destroyed the power of Pashtun Rohillas in Rohilkhand and captured Najibabad. • Died of typhoid fever, at his camp at Wanavdi near Pune on 12 February 1794 while he was at the zenith of power.

 **Nana Phadnavis**	• Was a prominent minister and statesman of the Maratha Empire during the Peshwa administration in Pune. • Handled the Peshwai well and with great unity among Maratha chiefs. • The then rising powers have been halted by his great efforts and continued to serve the Peshwas until his death in 1800AD.

MODERN HISTORY

British India (1612–1947)

In 1617 the British East India Company was given permission by Mughal Emperor Jahangir to trade in India. As a result of three Carnatic Wars, the British East India Company gained exclusive control over the entire Carnatic region of India. The Anglo-Mysore Wars (1766–1799) and later the Anglo-Maratha Wars (1772–1818) led to control of the vast regions of India. Ahom Kingdom of North-east India first fell to Burmese invasion and then to British after Treaty of Yandabo in 1826. Punjab, North-West Frontier Province, and Kashmir were annexed after the Second Anglo-Sikh War in 1849; however, Kashmir was immediately sold under the Treaty of Amritsar to the Dogra Dynasty of Jammu and thereby became a princely state.

The border dispute between Nepal and British India, which sharpened after 1801, had caused the Anglo-Nepalese War of 1814–16 and brought the defeated Gurkhas under British influence. In 1854, Berar was annexed, and the state of Oudh was added two years later. Their policy was sometimes summed up as Divide and Rule, taking advantage of the enmity festering between various princely states and social and religious groups.

In 1757, Clive was appointed by the company as its first 'Governor of Bengal'. In same year Treaty of Allahabad was concluded by which the Mughal Emperor granted the Diwani rights to the English East India Company. Thus the British power in India was thoroughly established.

Governors (1757–1854)
• Robert Clive 1757–1760
• Henry Vansittart 1760–1764
• Robert Clive 1765–1766
• Harry Verelst 1767–1769
• John Cartier 1769–1772
• Warren Hastings 1772–1774
• Charles Cornwallis 1786–1793
• Richard Wellesley 1798–1805
• Charles Cornwallis 1805–1805
• James Broun-Ramsay 1848–1854

East India Company before 1857		
Event	**Involved**	**Consequences**
First Carnatic War (1746-1748)	French La Bourdonnais and British Admiral Edward Peyton fought at Negapatam	British victory
Second Carnatic War (1749-1754)	Nasir Jung aided by France while England aided Muzaffar Jung	• Ended with the Treaty of Pondicherry in 1754 and Muzafar Jung became the Nizam. • Dupleix was replaced by Godeheu as the French governor.
Third Carnatic War (1758-1763)	At Wandiwash (1760) Count de Lally French commander was defeated by British General Sir Eyre Coote	• Defeat of French • Treaty of Paris (1763) was signed, which returned Chandernagore and Pondichéry to France.
Battle of Plassey (23 June 1757)	French supported Siraj-ud-Daula and East India Company led by Robert Clive.	• Paved way for British mastery of Bengal and eventually whole of India. • Rich revenue of Bengal helped British to maintain strong army.
Battle of Buxar, 22nd October, 1764	East India Company led by Hector Munro and Mughal Emperor along with the Nawab of Bengal	• Treaty of Allahabad secured Diwani Rights for the Company to collect and manage the revenues of real estate.
1781 War	Forces of the Kingdom of Mysore and Great Britain.	• Eyre Coote defeated Haider Ali at Port Novo.
1784, Pitt's Act		• British government supreme got control over the company's affair and its administration.
War 1789 -1792	Tipu Sultan and East India Company	• Treaty of Seringapatam was signed. Tipu had to cede half of his territories to English and paid ₹ 330 lakhs as indemnity.
Awadh annexation 1856	Lord Dalhousie	• Introduced the famous Doctrine of Lapse.
The rebellion of 1857 Sepoy Mutiny	East India Company and united force of Indian leaders like (Bahadur Shah, Bakt Khan, Begum Hazart Mahal of Avadh, Tanti Tope, Nana Saheb, Azimullah, Rani Lakshmibai, Kunwar Singh etc.), The revolt marked the end of the East India Company's rule, now India came under the direct rule of the British Crown.	



SOCIAL AND CULTURAL REFORMS		
Date	**Person**	**Event**
1815	Raja Rammohan Roy	Established Atmiya Sabha. He was the first Indian to start an agitation for social, religious and political reforms.
1828	Raja Rammohan Roy	Established Brahmo Samaj to preach monotheism and purify Hinduism.
1839	Debendranath Tagore	Founded Tatvabodhini Sabha to propagate Ram Mohan Roy's ideas.
1850	Vidyasagar	Protest against child-marriage and promoted women education.
1850	Vishnu Shankar Pundit	Founded widow remarriage association.
1851	Naoroji Furdonji, Dadabhai Naoroji and S.S.Bengalee	Rehnumai Mazdayasan Sabha or Religious Reform Association.
1852	Kassondas Mulji	In Gujarat advocated widow remarriage.
1866	Dadabhai Naoroji	Established East India Association in London.
1872	Baba Ram Singh	Namdhari Movement originated in north-west corner of Sikh kingdom. It was also known as Kuka movement.
23 September, 1873	Mahatma Jyotirao Govindrao Phule	Formed Satyashodhak Samaj (Society of Seekers of Truth).
1875	Swami Dayanand Saraswathi	Founded Arya Samaj in Bombay. Called Vedas to be source of "true knowledge" and gave the motto "back to Vedas". Was against idol worship, child marriage and caste system.

1897	Vivekananda	Founded the Ramakrishna Mission to carry out humanitarian relief and social work.
1902	Swami Shradhananda	Started Gurukul near Hardwar to propagate more traditional idea of education.

THE FREEDOM STRUGGLE TIME LINE	
1885	Pherozeshah Mehta, K.T. Telang, Badruddin Tyabji formed Bombay Presidency Association.
28 Dec. 1885	Indian national congress was formed by Allan Octavian Hume
28-31 Dec. 1885	First session of Indian national congress was attended by 72 delegates under the presidency of W.C. Bannerjee.
1896-97	Bal Gangadhar Tilak initiated a no-tax campaign in Maharashtra.
20 July, 1905	Partition of Bengal order was passed by lord Curzon.
Dec. 1905	Gokhale then the president of Congress condemned the partition of Bengal and supported Swadeshi and Boycott movement.
1906	Dadabhai Naoroji became the president of National Congress and clearly declared their goal to be self-government or Swaraj like the other colonies.
30 Dec. 1906	All India Muslim League was formed by Aga Khan III and the founding meeting was hosted by Nawab Sir Khwaja Salimullah.
1909	The Indian councils Act or Morley-Minto Reform was announced.
1911	Government announced the withdrawal of Partition of Bengal.
1913	Ghadar Party founded by Punjabi Indians in the United States and Canada aiming at securing India's independence.
April, 1915	First session of Hindu Mahasabha was held under the presidentship of Maharaja of Kasim Bazar.
26 Dec. 1916	Lucknow Pact was signed dealing with the structure of the government of India and with relation to the Hindu and Muslim communities.
1917	Satyagraha started by M.K. Ghandhi in Champaran, Bihar.
1918	Edwin Montagu, then the Secretary of State and lord Chelmsford, the Viceroy produced a scheme of constitutional reform which was called as the Montague-Chelmsford reforms.
1919	Enactment of the Government of India Act.
March, 1919	Rowlatt Act was passed which enabled government to imprison people without trial.

13 April, 1919	Unarmed crowd gathered at Jallianwala Bagh to protest against the arrest of Dr. Saifuddin Kitchlew and Dr. Satyapal was attacked by the British army as commanded by Gerneral Dyer.
31 August, 1920	Khilafat Committee launched a non-cooperation movement.
1 February, 1922	M.K. Ghandhi announced mass civil disobedience.
5 Feb. 1922	Protesters participating in the Non-cooperation movement turned violent, leading to police opening fire in Chauri Chaura. Congress as a result halted the non-cooperative movement
1925	Communist Party came into existence.
Nov. 1927	Simon headed commission was set up to submit report on working of Indian constitution established by Government of India Act, 1919.
17 Nov. 1928	Lala Lajpat Rai died due to the injuries by the beating of local police during a protest demonstration at Lahore.
Dec. 1928	Gandhi joined back the active politics at Calcutta session.
26 Jan.1930	Was fixed as the first independences day and since then was celebrated every year up to 1947.
Feb. 1930	Chandra Shakhar Azad was shot dead in a park called Azad Park at Allahabad, in an encounter with police.
12 March, 1930	Dandi March lead by M.K.Ghandhi took place. Together with 78 companions he walked 375 km from Sabarmati Ashram to Dandi.
6 April, 1930	Gandhi reached Dandi and broke the Salt law.
12 Nov. 1930	First round table conference was held in London, was chaired by British Prime Minister Ramsay MacDonald.
5 March, 1931	Gandhi-Irwin Pact was signed between Gandhi and then viceroy of India Lord Irwin. According to which British agreed to withdraw all ordinances and end prosecutions and release all political prisoners.
24 August, 1932	Poona Pact was signed between Gandhi and Dr. B.R. Ambedkar at Yerwada Central Jail.
1935	Government of India Act was passed according to which All India Federation was established including British India and Princely States (representative were appointed by the rulers) forming a bicameral federal legislature.
October, 1940	Gandhi gave an order for a limited satyagraha (for few individuals only).
8 August, 1942	Quit India Movement was launched by M.K.Gandhi.
1945	Congress working committee adopted a resolution to abolish landlordism.

2 Sept. 1946	Interim government of India was formed the newly elected Constituent Assembly of India. This Idea was rejected by Muslim league.
9 Dec. 1946	The Constituent Assembly met for the first time.

INTERIM GOVERNMENT		
External Affairs and Commonwealth Relations	:	Jawaharlal Nehru
Defence	:	Baldev Singh
Home (including Information and Broadcasting)	:	Vallahbhai Patel
Finance	:	Liaquat Ali Khan
Posts and Air	:	Abdur Rab Nishtar
Food and Agriculture	:	Rajendra Parsad
Labour	:	Jagjivan Ram
Transport and Railways	:	M. Asaf Ali
Industries and Supplies	:	John Matthai
Education and Arts	:	C. Rajgopalacharia
Works, Mines and Power	:	C.H. Babha
Commerce	:	I.I. Chundrigar
Law	:	Jogindar Nath Mandal
Health	:	Ghazanfar Ali Khan

Mountbatten Plan

The Indian Independence Act 1947 also called 3 June Plan or Mountbatten Plan, declared that power would be handed over by 15 August 1947. It gave India and Pakistan a dominion status. The Act received the royal assent on 18 July 1947. The boundaries between the two dominion states were determined by a Boundary Commission which was headed by Sir Cyril Radcliff.

List of Presidents of the Party		
C. Vijayaraghavachariar	1920	Nagpur
Hakim Ajmal Khan	1921	Ahmedabad
Deshbandhu Chittaranjan Das	1922	Gaya
Mohammad Ali Jouhar	1923	Kakinada
Abul Kalam Azad	1923	Delhi (Special Session)
Mohandas Gandhi	1924	Belgaum
Sarojini Naidu	1925	Kanpur
S. Srinivasa Iyengar	1926	Gauhati
Mukhtar Ahmed Ansari	1927	Madras
Motilal Nehru	1928	Calcutta
Jawaharlal Nehru	1929 & 30	Lahore
Vallabhbhai Patel	1931	Karachi
Madan Mohan Malaviya	1932	Delhi

Madan Mohan Malaviya	1933	Calcutta
Nellie Sengupta	1933	Calcutta
Rajendra Prasad	1934 & 35	Bombay
Jawaharlal Nehru	1936	Lucknow
Jawaharlal Nehru	1936& 37	Faizpur
Subhas Chandra Bose	1938	Haripura, Gujarat
Subhas Chandra Bose (resigned) Rajendra Prasad replaced Bose after the session.	1939	Tripuri, Madhya Pradesh / Chhatisgadh
Abul Kalam Azad	1940–46	Ramgarh
J. B. Kripalani	1947	Meerut
Pattabhi Sitaraimayya	1948 & 49	Jaipur
Purushottam Das Tandon	1950	Nasik
Jawaharlal Nehru	1951 & 52	Delhi
Jawaharlal Nehru	1953	Hyderabad
Jawaharlal Nehru	1954	Calcutta

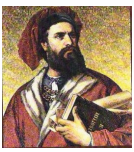
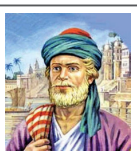
NEWPAPER/JOURNAL NAME

Newspaper/Journal Name	Founder
Bengal Gazette (1780) (India's First Newspaper)	J.K.Hikki
Kesari	B.G.Tilak
Amrita Bazar Patrika	Sisir Kumar Ghosh and Motilal Ghosh
Vande Mataram	Aurobindo Ghosh
Kavivachan Sudha	Bhartendu Harishchandra
Rast Goftar(first newspaper in Gujarati)	Dadabhai Naoroji
Statesman	Robert Knight
Hindu	Vir Raghavacharya and G.S. Aiyar
Yugantar	Bhupendranath Data and Barinder Kumar Ghosh
Bombay Chronicle	Firoze Shah Mehta
Hindustan	M.M. Malviya
Mooknayak	B.R. Ambedkar
Comrade-1914	Mohammad Ali
Tahzib-ul-Akhlaq	Sir Syed Ahmed Khan
Al-Hilal-1914	Abul Kalam Azad
Al-Balagh	Abul Kalam Azad

Independent	Motilal Nehru
Punjabi	Lala Lajpat Rai
New India(Daily)	Annie Besant
Pratap	Ganesh Shankar Vidyarthi
Samvad Kaumudi (Bengali)	Ram Mohan Roy
Mirat-ul-Akbhar	Ram Mohan Roy (first Persian Newspaper)
Young India-1919	M.K Ghandhi
Harijan-1933	M.K Ghandhi
Hindustan Times	K.M. Pannikar

GREAT TRAVELERS IN INDIAN HISTORY

 **Megasthenes**	**Identity:** Greek ethnographer & ambassador. **Time of Visit to India:** during the rule of Chandragupta Maurya. **Duration of Stay:** 302-298 BC. **Contribution:** wrote the book **Indica**.
 **Fa Hsien**	**Identity:** a Buddhist Monk who came from China. **Time of Visit to India:** reign of Chandragupta II. **Duration of Stay:** 405-411 AD. **Contribution:** wrote **'Record of Buddhist kingdoms'.**
 **Husuain-tsang/ Xuanzang**	**Identity:** Chinese Buddhist monk. **Time of Visit to India:** reign of Chandragupta II. **Duration of Stay:** 630-645 AD. **Contribution:** wrote **Si-yu-ki** or the 'Records of Western World.
 **Al-Biruni/ Abu Rayhan Muhammad**	**Identity:** Muslim scholar and polymath from Persia **Time of Visit to India:** Came along with Mahmud of Ghazni. **Duration of Stay:** 1024-1030 AD **Contribution:** wrote **Taharikh-al-Hind**, about social religious, political nature of India this time.
 **Marco Polo**	**Identity:** Italian merchant traveler **Time of Visit to India:** Came during the Period of Rudramani Devi of Kakatiya Dynasty. **Duration of Stay:** 1292-1294 AD **Contribution:** wrote "**The book of sir Marcopolo**", describing about Indian Economy at that time.

 **Ibn Battuta**	**Identity:** Traveller of Morocco **Time of Visit to India:** Came in India at the reign of Muhammad bin Tughluq. **Duration of Stay:** 1333-1347 AD **Contribution:** write **Rihla**, relating geographical, social and economical behaviour of this time.
 **Nicolo Conti**	**Identity:** Russian merchant Traveller **Time of Visit to India:** Came in India in Bahmani Sultanate. **Duration of Stay:** 1469-1472 **Contribution:** 'The Journey beyond Three Seas'.
 **William Hawkins**	**Identity:** Ambassador of James II, king of England **Time of Visit to India:** Came in India at the reign of Jahangir, the great mogul along with William finch came with him. **Duration of Stay:** First Visit: 1421 Revisited: 1430
 **Afanasy Nikitin**	**Identity:** Italian Traveller **Time of Visit to India:** Came during the rule of Devaraya I of Sangam dynasty of vajay nagar empire. **Duration of Stay:** First Visit :1421 Revisited: 1430 **Contribution:** Author of "Voyage aux Indes.
Abdur Razzaq	**Identity:** Persian traveller **Time of Visit to India:** Came in India in Bahmani Sultanate. **Duration of Stay:** 1443-1444 AD

WORLD HISTORY MIND MAP

ANCIENT

- Mesopotamian Civilization (5000 – 900 BC)
- Egyptian Civilization (500 – 30 BC)
- Israel Kingdom (1300 – 63 BC)
- Greek Civilization (776 – 388 BC)
- Roman Civilization (753 BC - 476 AD)

MEDIEVAL

- Medieval Europe Civilization
  - Feudalism
  - Crusades
- African Civilization
- Mongol Empire Civilization
- Arab civilization

MODERN

- Renaissance
- Reforms
- Major Revolutions of World
  - Glorious Revolution
  - Industrial Revolution
  - American Revolution
  - French Revolution
  - Russian Revolution
- An insight into World Wars
- Major wars of World
  - Trojan War
  - Persian War
  - Peloponnesian War
  - Punic Wars
  - Hundred Years War
  - Russo-Japan War
  - Vietnam War
  - Iraq War

ANCIENT HISTORY

MESOPOTAMIAN CIVILIZATION

Time Period	Events
5000-3500 BC	The first city built by Sumerian people in southern Mesopotamia.
3500 BC	Writing started with pictogram based script and took about a thousand year to be evolved in full cuneiform script
2300 BC	The first akkadian ruler Sargon started to conquer Sumerian cities
2112-2095 BC	The central city of Ur was built by Ur-Nammu and called as the third dynasty of Mesopotamian.
1792-49 BC	Development of Babylonian civilization by king Hammurabi along Euphrates River.
1530 BC	Kassite came into being in Hammurabi's rule in 1750 BC and categorized into minorities of Mesopotamia.
1500 BC	Northern Mesopotamia is conquered by an Indo-European ruler called Mittani. He has also conquered Syria and Asia Minor.
1200 - 900 BC	Assyria started to lose its importance due to political instability engulfing Anatolia, Syria, and the Levant coast.

EGYPTIAN CIVILIZATION

Time Period	Events
5000 BC	Farming started along the bank of Nile River.
3500-3000 BC	Starting of Pre dynastic period which was characterized by permanent settlement.
2650 BC	Old kingdom began to flourish which was known to be the era of dynamic development of Egyptian art.
2575-2465BC	Pharaoh Khufu built Great pyramid of Giza having a height of 481 feet.
2381-2345BC	The Old Kingdom ended during the realm of Unas.
2055 BC-c. 1650 BC	The era of middle kingdom started with reunion of Egypt.
1539 BC	With the expulsion of the Hyksos and reunification of Egypt, it became the leading power in the Middle East.
1344-1328BC	The first ever instance of monotheism had been illustrated by the religious reforms of pharaoh Akhenaton.
1336-1327BC	The realm of Tutankhamen.
1279-1213BC	The existence of Ramses Realm when Egypt experienced the height of its power.
728BC	Nubian kings took over the power of Egypt.

639BC	The period of revival started with the expulsion of Assyrians by Egyptians.
525BC	Persians started ruling the Egypt.
332BC	Alexander the great conquered Egypt.
305BC	A greek-speaking dynasty was established by one of the generals of Alexander the Great.
30BC	the last queen of independent Egypt died and Roman empire occupied Egypt.

THE KINGDOM OF ISRAEL

Time Period	Events
1300-1200 BC	The land of Canaan occupied by the Israelites
1050-970BC	The kingdom was ruled by Soul followed by David
970BC	David's son Solomon became the new king
931BC	The kingdom divided into north (Israel) and south(Judah) parts
722BC	The Assyrians destroyed the northern kingdom,
620BC	A religious revival took place in southern kingdom of Judah
597-582	The destruction of both Judah and Jerusalem occurred
538BC	The Persian king Cyrus repatriated the kings of Judah and Jerusalem and encouraged them to rebuild the temple in Jerusalem
164BC	The revolution broke out against the Seleucid kings under the leadership of the Maccabbees brothers by Jews
63BC	Judaea was conquered by Romans and the family of Herod the Great started ruling.

GREEK CIVILIZATION

Time Period	Events
776 BC	The first official date of Olympic Games
750BC	Greek started planting colonies on the Mediterranean coast
490-479	Athens and Sparta took lead for defending their land against invasion from the huge Persian Empire
447BC	Athenian Empire was at the height of its power
431-404	Athens was defeated by Sparta in the Second Peloponnesian War
399	Socrates, the famous philosopher of Athens was sentenced to death as he was questioning conventional ideas
338	The Greek city-states were defeated by King Phillip II of Macedon

ROMAN CIVILIZATION

Time Period	Events
753 BC	Rome was founded
509BC	Roman republic was built
390BC	Rome was sacked by the Gauls
264-241BC	First Punic War between Carthage and Rome took place
218-202 BC	Second Punic War consisting of several small battles took place where Rome was the ultimate winner
83-31 BC	Decline of Roman Republic due to the continuous phase of civil wars
27 BC	Augustus established himself as the first of the Roman emperors
117AD	Roman Empire became the largest empire of its time
312AD	Constantine the great got converted to Christianity
410AD	Goths sacked Roman Empire
476AD	The last Roman emperor was thrown out by German Tribes

MEDIEVAL HISTORY

MEDIEVAL EUROPE CIVILIZATION

Time Period	Events
500-600AD	• A monastery was built in Italy. • Christianity was introduced in England. • The foundation stone of Roman Catholic Church was laid by Gregory the Great.
650-700AD	History of the English Church and People was written by Bede
800AD	Charlemagne, the King of the Franks, was crowned as Holy Roman Emperor.
850-900AD	First Russian states founded at Kiev and Novgorod
900-950AD	Viking raids across Western Europe
1000-1050	Medical school set up in Salerno, Italy (1030)
1050-1100 AD	• William of Normandy invaded England and becomes king • First Crusade was proclaimed
1150-1200 AD	Construction of the cathedral of Notre Dame
1200-1250 AD	• St Francis of Assisi sets up a monastic order, emphasizing austerity and compassion • Rebellion against the king by the Lords of England as he signed the Magna Carta, accepting to rule according to law.
1250-1300 AD	Establishment of the Hapsburg dynasty that continued to rule Austria till 1918

Feudalism was a socio-political hierarchy which started in 8th century AD in Europe and ended in 14th century AD.

Crusades were the series of military campaign organized under the banner of the cross so as to recover the holy places of Palestine from Muslim occupation.

AFRICAN CIVILIZATION

Time Period	Events
830AD	Ghana Empire was created
1050-1100AD	Expansion of Almoravid kingdom from Ghana to southern Spain
1100-1150AD	Emergence of Zimbabwe as a centre for producing gold and copper artifacts and long distance trade.
1200-1250 AD	• Christian churches established in Ethiopia • Kingdom of Mali was established in West Africa, with Timbuktu as a centre of learning
1375 AD	Gao rebelled against and Songhai started to expand its realm
1465 AD	Songhai conquered Mema and after three years seized Timbaktu
1588–91 AD	Songahi was attacked by Moroccan forces with firearms and they kept on conquering Tondibi, Timbuktu and Gao one after the other

MONGOL EMPIRE

Time Period	Events
1206 AD	Temüjin from the Orkhon Valley received the title Genghis Khan, and started ruling the unified nomads of Mongolia homeland
1227 AD	Death of Genghis Khan
1250–1350 AD	Pax Mongolica or stabilization of Mongol empire
1260-1294 AD	Fragmentation of Mongol Empire into Ilkhanate Yuan dynasty, Chagatai Khanate, Golden Horde
1368 AD	Fall of Yuan dynasty
1687 AD	Collapse of Chagatai Khanate

ARAB CIVILIZATION

Time Period	Events
571AD	• The great Prophet of Islam, was born in Mecca • With the rise of new religion Islam, the Arab civilization started expanding its realm
632AD	After the death of Mohammad his successors continued to spred his teachings and were known as Caliphs or Khalifas
13th Century AD	The Islamic Empire came to end with the defeat of Abbasids by Seljuq Turks

MODERN HISTORY

Renaissance

The European era between 14th to 17th centuries AD was designated as the Age of Renaissance generally known for "Revival of Learning". The Florence city of Italian region Tuscany was well known as the birth place of Renaissance.

Reformation

Reformation It was a social movement initiated by Martin Luther during 16th century in Europe against Roman Catholic Church. He started criticizing the selling of self indulgence of higher authorities in the church by highlighting the fact that the Pope had no authority over the purgatory and there was no evidence of catholic doctrine of the merits of the saints in the gospel.

Major Revolutions of Modern World

Glorious Revolution It was otherwise known as the Bloodless Revolution primarily focused on securing freedom of worship from Catholics and unifying Whigs and Tories of Anglican church against the Roman Catholic ruler James II.

Industrial Revolution It was the process of change in earning livelihood by adopting industrial processes rather than agriculture. It started during mid 18th century in Britain with the invention of several technological aids such as spinning jenny by James Hargreaves in 1764, water-powered spinning frame by Richard Arkwright in 1769, spinning mule by Samuel Crompton in 1779, power loom by Edmund Cartwright in 1785, steam engine by James Watt in 1769 etc.

American Revolution It was the mutiny of people leaving in thirteen colonies of England in North America in late eighteenth century. Various factors such as French and Indian War, stamp act, Townshend Acts, Boston Massacre, Boston Tea Party/Intolerable Acts, can be considered as the triggering fact of this revolution in 1775-83.

French Revolution It was one of the greatest revolutions of eighteenth century which put an end to French monarchy. It was lasted from 1789 until 1799, and partially carried forwarded by Napoleon during the later expansion of the French Empire

Russian Revolution Based on the ideology of Marxism, Russian revolution took place in1917 and eventually ended up in creating the Russian Soviet Union. The prime causes of these revolutions were the autocratic rule Czars, inefficient and vigorous use of power, low living standard of people in the society, to support church forcefully.

AN INSIGHT INTO WORLD WARS

Event	World War I	World War II
Countries Involved	Germany, Austria-Hungary, Bulgaria, Turkey vs. France, Russia, Britain, US, Italy.	Britain, France, USSR, US, Other nations vs. Germany, Italy, Japan
Duration of War	July 28, 1914 – November 11, 1918	September 1, 1939 – September 2, 1945

Causes	**Immediate** Murder of Austrian King Archduke Ferdinand at Serajevo by a Serbian which resulted in strong hostility between Austria-Hungary and Serbia. **Associated** • Militarism • Nationalism or Competitive Patriotism • Economic Imperialism • Anglo-German Rivalry and the charter of William II • Lack of International Organization	**Immediate** Germany's ultimatum and Poland's rejection for surrender of Port Dazing. Refusal of Poland to establish rail link between Germany and West Prussia through Polish corridor **Associated** • The treaty of Versailles (1919) • Nationalist movement of Germany & Italy. • Ideological conflict between Dictatorship and Democracy • Inefficiency of League of Nation • Colonial and commercial rivalry • Aggressiveness of Berlin-Rome –Tokyo axis
Consequences	• End of the German, Russian, Ottoman and Austro-Hungarian empires • Formation of new countries in Europe and the Middle East. • Transfer of German colonies and regions of the former Ottoman Empire to other powers • Establishment of the League of Nations	• Collapse of Nazi Germany • Fall of Japanese and Italian Empires • Creation of the United Nations • Emergence of the United States and the Soviet Union as superpowers • Beginning of the Cold War

Major Wars in History

Trojan War:

- **Participants:** City of Troy Vs City of Sparta
- **Duration of War:** 10 years
- **Causes of War:** The war resulted due to the kidnapping of Queen Helen from her husband, the king of Sparta by the Trojan Prince
- **Outcome of war:** The war ended with victory of Greek and destruction of Troy.

Persian War

- **Participants:** Greek vs. Persia
- **Duration of War:** 499 BC–449 BC
- **Causes of War:** The king of Persia, Darius I attacked Athens when the series of Greeek uprisings were suppressed.
- **Outcome of war:** The Greek made its victory against Persia,

Peloponnesian War:

- **Participants:** Athens vs. Sparta
- **Duration of War:** 431 BC – 404 BC

- **Causes of War:** The war occurred due to the political fragmentation and mutual two city states of Greece, Athens and Sparta .
- **Outcome of War:** Eventually Sparta registered its victory by defeating Athens in Decelean war (known to be the third phase of Peloponnesian War), with the help of Persian Empire.

Punic Wars:

First

- **Participants:** Rome vs. Carthage
- **Duration of War:** 264 BC -241 BC
- **Causes of War:** the war broke out as the Carthaginians established a base of Island that seemed to be a potential threat to Rome.
- **Outcome of War:** the Romans won the war.

Second

- **Participants:** Greek vs. Trojan
- **Duration of War:** 218 BC- 201 BC
- **Causes of War:** The war occurred when Carthage started expanding its power in Spain and striving for the coastal city of Saguntum (the present day Sagunto) which was allied with Rome.
- **Outcome of War:** Finally Rome won over Carthage in the battle of Zama forcing the Carthaginians to give up Spanish territories and its navy.

Third

- **Participants:** Greek vs. Persian
- **Duration of War:** 149 BC- 146 BC
- **Causes of War:** The fear of Carthaginian resurgence led to the war in the city streets of Carthage
- **Outcome of War:** Ultimately Romans destroyed the city of Carthage

Hundred Years War

- **Participants:** France vs. England
- **Duration of War:** 1337 BC -1453 BC
- **Causes of War:** The war broke out after King Edward III of England invaded the country of France and continued to seize its land and became its ruler.
- **Outcome of War:** At the end France managed to defy the England's reign with the help of Scotland.

Russo-Japan War

- **Participants**: Russia vs. Japan
- **Duration of War:** 1904 – 05 AD
- **Causes of War:** The war fought for having imperial authority over Manchuria and Korea
- **Outcome of War:** Japanese won the war.

Vietnam War

- **Participants**: Democratic Republic of Vietnam allied with Soviet Union vs. China.
- **Duration of War:** 1955 – 75 AD
- **Causes of War:** The war fought for checking communism to spread all over South-Asia
- **Outcome of War:** the war ended with the victory of North Vietnam by empowering the Communist government in South Vietnam, Laos and Cambodia with annexure of South Vietnam. The American-led forces had to back out from Indochina.

Iraq –Iran War

- **Participants:** Islamic Republic of Iran and the Republic of Iraq
- **Duration of War:** 1980 – 88 AD
- **Causes of War:** The war started with the invasion of republic of Iran resulting from a border dispute of two Republics
- **Outcome of War**: Iraq failed to take over the east bank of the Shatt al-Arab and strengthen Arab separatism in the region of Khuzestan. The Iranian invasion failed and the idea of deposing Saddam Hussein was shattered.

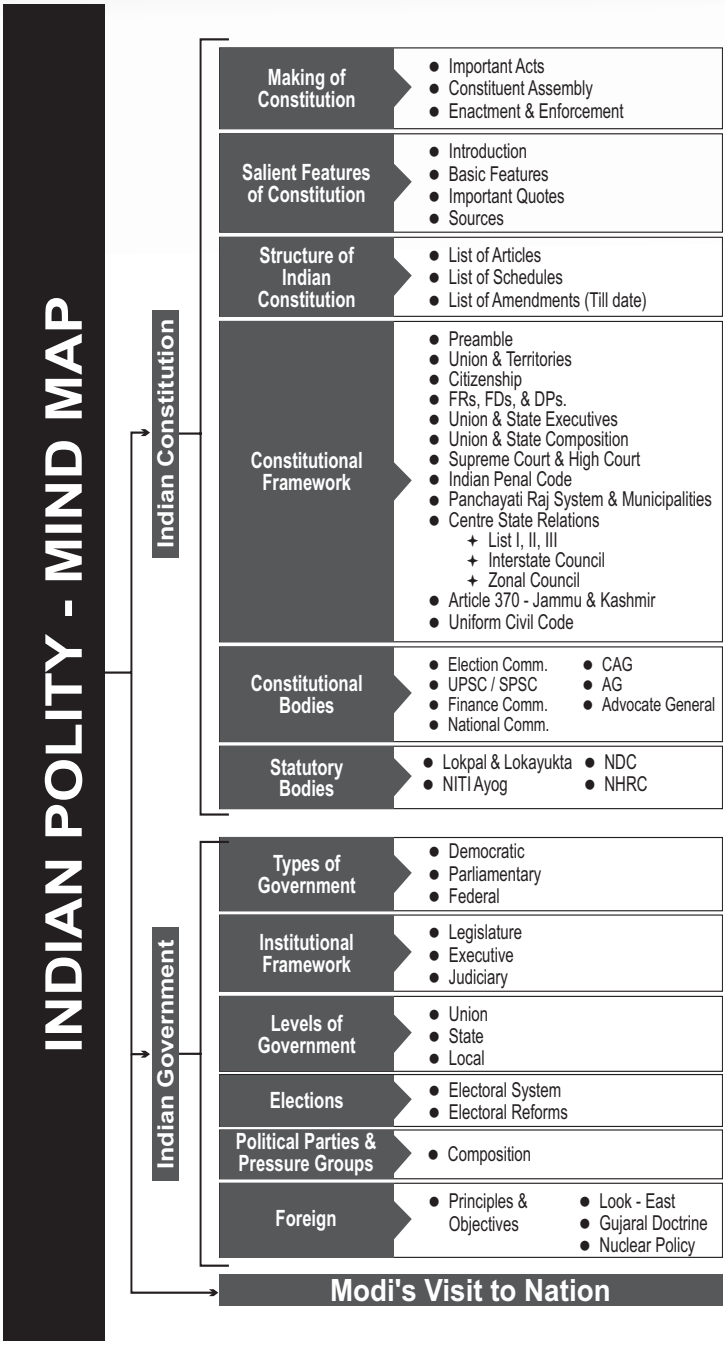






POLITY

- India
- World


INDIAN POLITY - MIND MAP
Indian Constitution
Making of Constitution
Important Acts
Constituent Assembly
Enactment & Enforcement
Salient Features of Constitution
Introduction
Basic Features
Important Quotes
Sources
Structure of Indian Constitution
List of Articles
List of Schedules
List of Amendments (Till date)
Constitutional Framework
Preamble
Union & Territories
Citizenship
FRs, FDs, & DPs.
Union & State Executives
Union & State Composition
Supreme Court & High Court
Indian Penal Code
Panchayati Raj System & Municipalities
Centre State Relations
List I, II, III
Interstate Council
Zonal Council
Article 370 - Jammu & Kashmir
Uniform Civil Code
Constitutional Bodies
Election Comm.
UPSC / SPSC
Finance Comm.
National Comm.
CAG
AG
Advocate General
Statutory Bodies
Lokpal & Lokayukta
NITI Ayog
NDC
NHRC
Indian Government
Types of Government
Democratic
Parliamentary
Federal
Institutional Framework
Legislature
Executive
Judiciary
Levels of Government
Union
State
Local
Elections
Electoral System
Electoral Reforms
Political Parties & Pressure Groups
Composition
Foreign
Principles & Objectives
Look - East
Gujaral Doctrine
Nuclear Policy
Modi's Visit to Nation

INDIAN CONSTITUTION

Making of Constitution

Important Acts

Constitutional Landmark	Important Provisions
Pitts India Act, 1784	• Indian affairs under direct control of British government. • Board of control was established.
Government of India, 1858	• Company rule replaced by British crown. • Secretary of state for India appointed to exercise the power of the crown. He was a member of British cabinet, responsible to it & was assisted by council of India with 15 members. • Governor General became the agent of the crown and now known as Viceroy of India.
Indian Councils Act, 1861	• Parliamentary system started in India. • Indians become non-official members of the legislature. • Started decentralization of power.
Indian Councils Act, 1909 (Morley-Minto Reforms. Lord Morley was the then secretary of state for India and Lord Minto was then Viceroy of India).	• Central legislative council becomes imperial legislative council with officials forming the majority. • Provincial legislative councils had a majority of non-official members. • Introduced communal representation for Muslims with a separate electorate system. Legalized communalism. Lord Minto created a communal electorate.
Government of India Act, 1919/ Montague - Chelmsford Reforms. Montague was the secretary of state for India and Lord Chelmeford was the Viceroy of India.	• Separated central subjects from provincial subjects. • Provincial subjects were: transferred and reserved. • Transferred subjects were administered by Governor with help of ministers who were responsible to the legislature. • Reserved subjects were administered by Governor and executive council who were not responsible to the legislature. • Diarchy/ Dual system of government was introduced. • Bicameral legislature with upper and lower houses were formed with direct elections. • Majority of members in both houses were directly elected. • 3 of the 6 members of governor-general's council had to be Indians.
Government of India Act, 1935	• Established All India federation of provinces & princely states as constituent units. • Federal, provincial & concurrent were introduced. • Abolished diarchy in provinces which now had provincial autonomy. • Introduced diarchy at the centre & bicameralism in the provinces. • Introduced responsible governments in provinces.

The August Offer, 1940	• Expansion of the Governor-General's Executive council to include more Indians. • Establishment of an advisory war council.
Cripps Proposals, 1942	• Provision made up for participation of Indian states in the constitution making body. • The leaders of the principle sections of the Indian people were invited to take active and effective participation in the councils of their country.
Cabinet Mission Plan, 1916	• There should be a Union of India, embracing both British India and the states which should deal with foreign affairs. • A Constituent Assembly should be set up to draw up the future constitution of the country.
Indian Independence Act, 1947	• Declared India as independent & sovereign state. • Established responsible government at the center & provinces. • Designated Governor General of India & Provincial Governors as Constitutional heads or nominal heads.
Objective Resolution	• On Jan 22, 1947 the Constituent Assembly adopted Objective resolution as advocated by Jawahar Lal Nehru. It contained fundamental propositions of the constitution & set forth the political ideas that should guide its deliberations.

Constituent Assembly

- The Constituent Assembly was constituted in Nov. 1946 under the scheme formulated by the Cabinet Mission Plan 1946.
- Total members – 389
- Members elected indirectly from British India – 296
- Members nominated by princely states. – 93
- The Constituent Assembly had both Nominated & Elected members. The elected members were indirectly elected by members of the Provincial Assemblies.
- 1st meeting of Constituent Assembly –Dec.9, 1946.
- Muslim League boycotted the Constituent Assembly.
- Temporary president of the Assembly – Dr. Sachidanand.
- Permanent President of the Assembly – Dr. Rajendra Prasad.
  Vice President of the Assembly – H.C. Mukherjee.
  Constitutional Advisor to the Assembly – Sir B.N.Rau

Important Committees	
COMMITTEE	**CHAIRMAN**
Drafting Committee	Dr. B.R. Ambedkar
Flag Committee	J. B. Kriplani
Union Constitution Committee	Jawaharlal Nehru
Provincial Constitution Committee	Sardar Vallabh Bhai Patel
Union Powers Committee	Jawaharlal Nehru

Committee on Fundamental Rights and Minorities	Sardar Vallabh Bhai Patel
Special Committee to Examine the Draft Constitution	(Chairman: Alladi Krishnaswamy Iyer)
Expert Committee on Financial Provisions	
Ad-hoc Committee on Supreme Court	
Ad-hoc Committee on National Flag	
Committee on Chief Commissioners' Provinces	

Drafting Committee

It consisted of 7 members –

1 Dr. B.R. Ambedkar (Chairman)
2 N. Gopalaswamy Ayyangar
3 Alladi Krishnaswamy Ayyar.
4 Dr. K.M. Munshi
5 Syed mohammad Saadullah.
6 N. Madhava Rau
7 T.T Krishnamachari

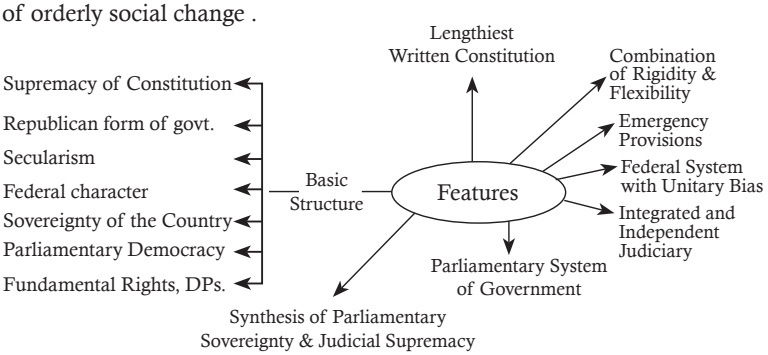
The Drafting Committee took less than 6 months to prepare its draft. In all it sat only for 141 days. Indian Constitution was formed by a Constituent Assembly in a long time of 2 years, 11 months & 18 days.

Enactment & Enforcement of the Constitution

The constitution was adopted on Nov. 26,1949, contained a Preamble, 395 Articles & 8 Schedules. Now, it increased to 447 Articles & 12 Schedules. It came into force on January 26,1950. This day is celebrated as the Republic Day.

Salient features of the Constitution

The term Constitution is derived from Latin word "Constituere" which means "to establish". A Constitution is something established as the basis of government (whether by a constitutional convention or by process of evolution). The Constitution of our country is a collection of legal rules which provides the framework of the governmental machinery & also it is an effective instrument of orderly social change .



Features of Indian Constitution

Sources of Indian Constitution

Indian constitution has borrowed its provisions from following sources.

Country	Provisions Borrowed
Government of India Act, 1935	Federal scheme Declaration of emergency powers Ordinance defining the power of the President and Governors Office of the Governor Power of federal judiciary Administration at the centre and state level
United Kingdom	Parliamentary system Bicameral parliament Prime minister Council of ministers Single citizenship Office of CAG Writ jurisdiction of courts Rule of law
USA	Written constitution Fundamental rights Supreme Court President as executive head of the state Impeachment of the president, removal of S.C and HC judges Vice President as chairman of Rajya Sabha Judicial review, independence of judiciary
Australia	Concurrent list Cooperative federalism Centre State relationship Joint sitting of two houses of parliament
USSR	Fundamental duties
Weimer Constitution of Germany	Suspension of fundamental rights during emergency Ballot system
Canada	Federal system Residuary powers Appointment of Governor Advisory jurisdiction of S.C.
South Africa	Procedure of constitutional amendment. Electing member to Rajya Sabha
Ireland	Concept of Directive Principles of State Policy. Nomination of members to Rajya Sabha by the President. Presidential election.

Schedules of the Constitution

Numbers	Subject Matter	Articles Covered
First Schedule	Names of the States and their territorial jurisdiction.	1 and 4
	Name of the Union Territories and their extent.	

Second Schedule	Provisions relating to the emoluments, allowances, privileges and so on of:	59, 65, 75, 97, 125, 148, 158, 164, 186 & 221
	The President of India	
	The Governors of States	
	The Speaker and the Deputy Speaker of the Lok Sabha	
	The Chairman and the Deputy Chairman of the Rajya Sabha	
	The Speaker and the Deputy Speaker of the Legislative Assembly in the states	
	The Chairman and the Deputy Chairman of the legislative Council in the states	
	The Judges of the Supreme Court	
	The Judges of the High Courts	
	The Comptroller and Auditor - General of India	
Third Schedule	Forms of Oaths or Affirmations for:	75, 84, 99, 124, 146, 173, 188 and 219
	The Union ministers	
	The candidates for election to the Parliament	
	The members of Parliament	
	The Judges of the Supreme Court	
	The Comptroller Auditor - General of India	
	The state ministers	
	The candidates for election to the state legislature	
	The members of the state legislature	
	The judges of the High Courts	
Fourth Schedule	Allocation of seats in the Rajya Sabha to the states and the union territories.	4 and 80
Fifth Schedule	Provisions relating to the administration and control of scheduled areas and scheduled tribes.	244
Sixth Schedule	Provisions relating to the administration of tribal areas in the states of Assam, Meghalaya, Tripura and Mizoram.	244 and 275
Seventh Schedule	Division of power betweeen the Union and the States in terms of List I (Union List), List II (State List) and List III (Concurrent List). Presently, The Union List contains 100 subjects (originally 97), The State list contains 61 subjects (Originally 66) and the concurrent list contains 52 subjects (originally 47).	246
Eighth Schedule	Languages recognized by the Constitution. Originally, it had 14 languages but presently there are 22 languages. They are: Assamese, Bengali, Bodo Dogri (Dongri), Gujarati, Hindi, Kannada, Kashmiri, Konkani, Mathili(Maithili), Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, sanskrit, Santhali, Sindhi, Tamil, Telugu and Urdu. Sindhi was added b the 21st Amendment Act of 1967: Konkani, Manipuri and Nepali were added by the 71st Amendment Act of 1967; Konkani, Manipuri and Nepali were added by the 71st Amendment Act of 1992; And Bodo, Dongri, Maithili and Santhali were added by the 92nd Amendment Act of 2003.	344 and 351

Ninth Schedule	Acts and Regulations (originally 13 but presently 282) of the state legislatures dealing with land reforms and abolition of the zamindari system and of the Parliament dealing with other matters. This schedule was added by the 1st Amendment (1951) to protect the laws included in it from judicial scrutiny on the ground of violation of fundamental rights. However, in 2007, the Supreme Court ruled that the laws included in this schedule after April 24, 1973, are open to judicial review.	31 - B
Tenth Schedule	Provisions relating to disqualification of the members of Parliament and State Legislatures on the ground of defection. This schedule was added by the 52nd Amendment Act of 1985, also known as anti defection Law.	102 and 191
Eleventh Schedule	Specifies the powers, authority and responsibilities of Panchayats. It has 29 Matters. This schedule was added by the 73rd Amendment Act of 1992.	243 - G
Twelfth Schedule	Specifies the powers, authority and responsibilities of Municipalities. It has 18 matters. This schedule was added by the 74th Amendment Act of 1992.	243 - W

List of Important Amendment

No	Amendments	Enforced since	Objectives
1	Amend articles 66 and 71.	19 December 1961	Election of Vice President by Electoral College consisting of members of both Houses of Parliament, instead of election by a Joint Sitting of Parliament. Indemnify the President and Vice President Election procedure from challenge on grounds of existence of any vacancies in the electoral college
2	Amend article 31. Insert article 31C.	20 April 1972	Restrict property rights and compensation in case the state takes over private property
3	Amend articles 81, 330 and 332.	17 October 1973	Increase size of Parliament from 525 to 545 seats. Increased seats going to the new states formed in North East India and minor adjustment consequent to 1971 Delimitation exercise
4	Amend article 371. Insert articles 371D and 371E. Amend schedule 7.	1 July 1974	Protection of regional rights in Telangana and Andhra regions of State of Andhra Pradesh

5	Amend articles 31, 31C, 39, 55, 74, 77, 81, 82, 83, 100, 102, 103, 105, 118, 145, 150, 166, 170, 172, 189, 191, 192, 194, 208, 217, 225, 226, 227, 228, 311, 312, 330, 352, 353, 356, 357, 358, 359, 366, 368 and 371F. Insert articles 31D, 32A, 39A, 43A, 48A, 131A, 139A, 144A, 226A, 228A and 257A. Insert parts 4A and 14A. Amend schedule 7.	1 April 1977	Amendment passed during internal emergency by Indira Gandhi. Provides for curtailment of fundamental rights, imposes fundamental duties and changes to the basic structure of the constitution by making India a "Socialist Secular" Republic
6	Amend articles 330 and 332.	16 June 1986	Provide reservation to Scheduled Tribes in Nagaland, Meghalaya, Mizoram and Arunachal Pradesh Legislative Assemblies
7	Amend article 326.	28 March 1989	Reduce age for voting rights from 21 to 18
8	Amend article 356.	16 April 1990	Article 356 amended to permit President's rule up to three years and six months in the state of Punjab
9	Amend article 338.	12 March 1990	National Commission for Scheduled Castes and Scheduled Tribes formed and its statutory powers specified in The Constitution.
10	Amend article 16.	9 June 2000	Protect SC / ST reservation in filling backlog of vacancies
11	Amend article 335.	8 September 2000	Permit relaxation of qualifying marks and other criteria in reservation in promotion for SC / ST candidates
12	Amend articles 45 and 51A. Insert article 21A.	12 December 2002	Provides Right to Education until the age of fourteen and Early childhood care until the age of six
13	Amend article 338. Insert article 338A.	28 September 2003	The National Commission for Scheduled Castes and Scheduled Tribes was bifurcated into The National Commission for Scheduled Castes and The National Commission for Scheduled Tribes

14	Amend Art 19 and added Part IXB.	12 January 2012	Added the words "or co-operative societies" after the word "or unions" in Article 19(l)(c) and insertion of article 43B i.e., Promotion of Co-operative Societies and added Part-IXB i.e., The Co-operative Societies. The amendment objective is to encourage economic activities of cooperatives which in turn help progress of rural India. It is expected to not only ensure autonomous and democratic functioning of cooperatives, but also the accountability of the management to the members and other stakeholders.
15	Insertion of new articles 124A, 124B and 124C. Amendments to Articles 127, 128, 217, 222, 224A, 231.	13 April 2015 [103]	The amendment provides for the formation of a National Judicial Appointments Commission. 16 State assemblies out of 29 States including Goa, Rajasthan, Tripura, Gujarat and Telangana ratified the Central Legislation, enabling the President of India to give assent to the bill.[104] The amendment is in toto quashed by Supreme Court on 16 October 2015.
16	Amendment of First Schedule to Constitution[105]	1 August 2015	Exchange of certain enclave territories with Bangladesh and conferment of citizenship rights to residents of enclaves consequent to signing of Land Boundary Agreement (LBA) Treaty between India and Bangladesh.

PREAMBLE	
Meaning	• Introduction or preface to the constitution. • Summary or essence of the Constitution
Components	• Source of Authority – People of India • Nature of Indian State – Sovereign, Socialist, Secular, Democratic & Republican. • Objectives of Constitution –Justice, Liberty, Equality & Fraternity.
Amendment	• 42nd Amnd Act 1976 added 3 new words – Socialist, Secular & Integrity.
Part of the Constitution	• In kesavananda Bharati case (1973), Supreme court held that preamle is an integra part of the constitution.

The Union & Its Territory

- Article 1 stipulates that India, that is Bharat, shall be Union of states.
- The country is described as 'Union' beacuse it is indestructible.
- The 'territory of India' includes the entire area over which the Sovereignty of India extends.
- Under Articles 2 &3, Parliament has the power to establish new States, form a new State from the territory of any State or by uniting two or more

States, increase or decrease the area of any State, or after the boundaries or the name of any State.

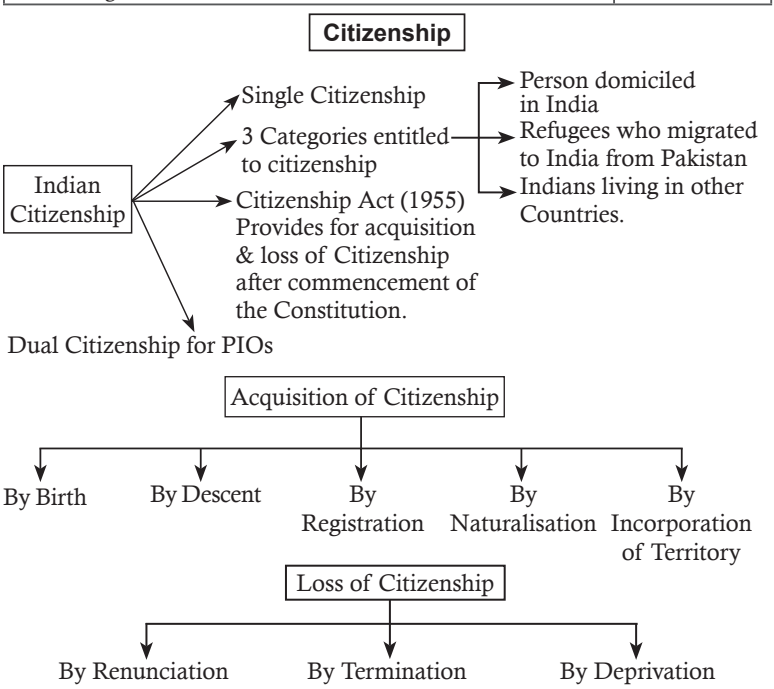
- First Linguistic State – Andhra Pradesh.

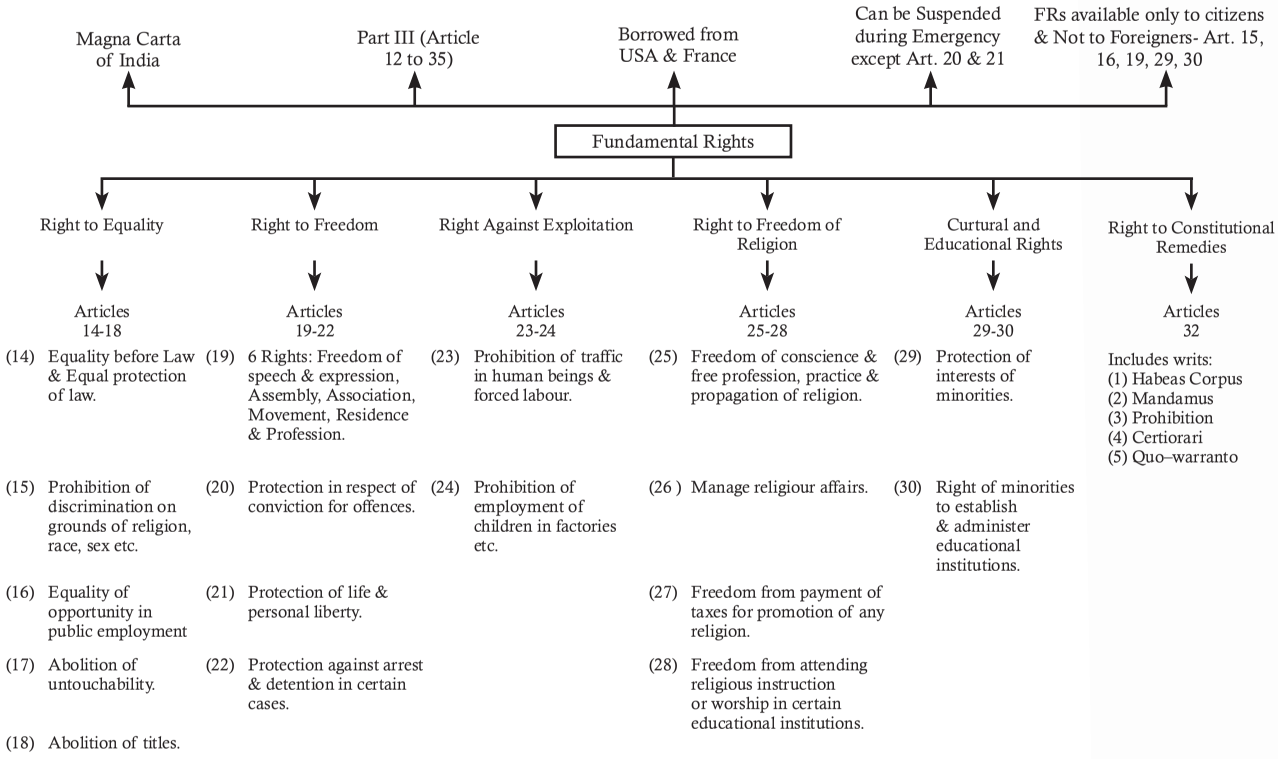
State Recorganisation Act 1956

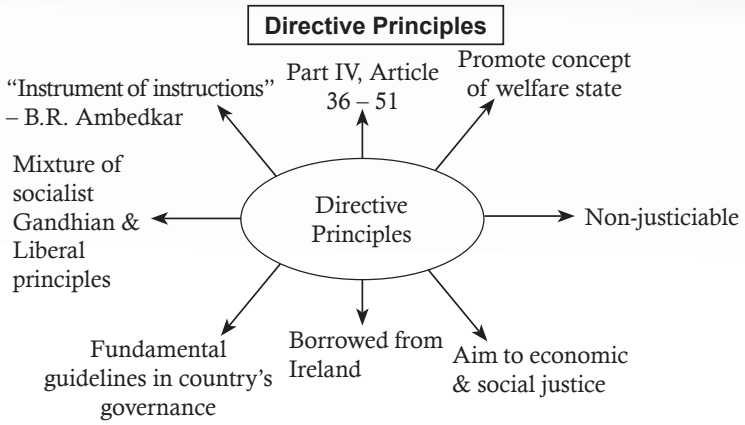
States Recorganisation Act 1956 was adopted by the Govt. of India that resulted in the formation of new states & UTs.

LIST OF NEW STATES & UTs CREATED AFTER 1956

STATES/UTs	YEAR
1. Maharashtra & Gujarat	1960
2. Dadra & Nagar Haveli	1961
3. Goa, Daman & diu	1962
4. Goa (Statehood)	1987
5. Puducherry	1962
6. Nagaland	1963
7. Haryana, Chandigarh	1966
8. Himachal Pradesh (Statehood)	1971
9. Manipur, Tripura & Meghalaya (Statehood)	1972
10. Sikkim (full – fledged State)	1975
11. Arunachal Pradesh & Mizoram	1987
12. Chhattisgarh, Uttarakhand & Jharkhand	2000
13. Telangana	2014




Magna Carta of India
Part III (Article 12 to 35)
Borrowed from USA & France
Can be Suspended during Emergency except Art. 20 & 21
FRs available only to citizens & Not to Foreigners- Art. 15, 16, 19, 29, 30
Fundamental Rights
Right to Equality
Articles 14-18
(14) Equality before Law & Equal protection of law.
(15) Prohibition of discrimination on grounds of religion, race, sex etc.
(16) Equality of opportunity in public employment
(17) Abolition of untouchability.
(18) Abolition of titles.
Right to Freedom
Articles 19-22
(19) 6 Rights: Freedom of speech & expression, Assembly, Association, Movement, Residence & Profession.
(20) Protection in respect of conviction for offences.
(21) Protection of life & personal liberty.
(22) Protection against arrest & detention in certain cases.
Right Against Exploitation
Articles 23-24
(23) Prohibition of traffic in human beings & forced labour.
(24) Prohibition of employment of children in factories etc.
Right to Freedom of Religion
Articles 25-28
(25) Freedom of conscience & free profession, practice & propagation of religion.
(26) Manage religiour affairs.
(27) Freedom from payment of taxes for promotion of any religion.
(28) Freedom from attending religious instruction or worship in certain educational institutions.
Curtural and Educational Rights
Articles 29-30
(29) Protection of interests of minorities.
(30) Right of minorities to establish & administer educational institutions.
Right to Constitutional Remedies
Articles 32
Includes writs:
(1) Habeas Corpus
(2) Mandamus
(3) Prohibition
(4) Certiorari
(5) Quo–warranto



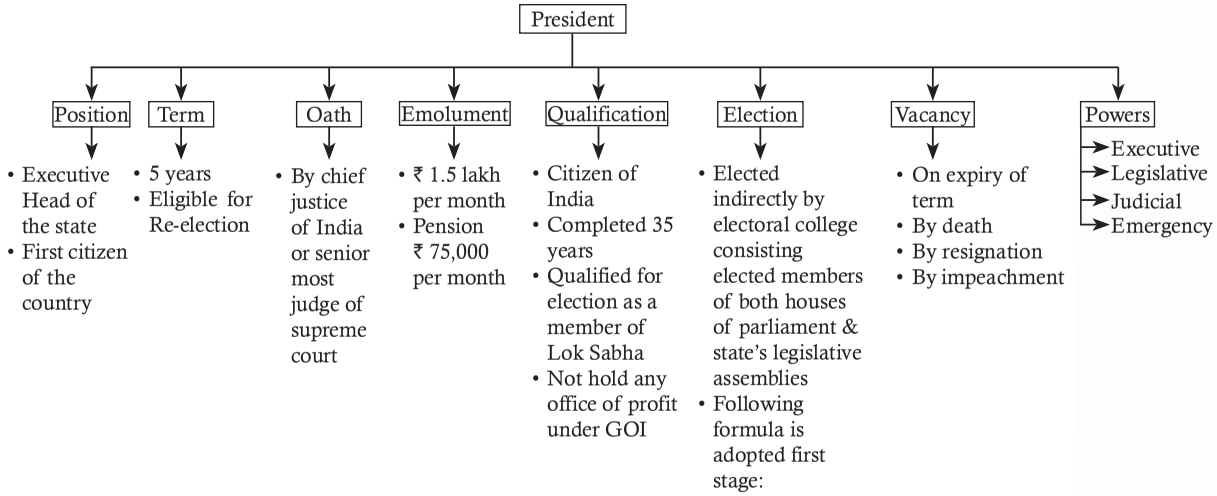
ARTICLES RELATED TO DIRECTIVE PRINCIPLES OF STATE POLICY AT A GLANCE

Article No.	Subject - matter
36	Definition of State
37	Application of the principles contained in this part
38	State to secure a social order for the promotion of welfare of the people
39	Certain principles of policy to be followed by the State • Means of livelihood to all. • Use of resources for common good. • Prevention of concentration of wealth • Equal pay for equal work • Protection of workers, children & youth
39 A	Equal justice and free legal aid
40	Organisation of village panchayats
41	Right to work, to education and to public assistance in certain cases
42	Provision for just and humane conditions of work and maternity relief
43	Living wage, etc., for workers
43 A	Participation of workers in management of industries
43 B	Promotion of co-operative societies
44	Uniform civil code for the citizens
45	Provision for early childhood care and education to children below the age of six years

46	Promotion of educational and economic interests of scheduled Castes, Scheduled Tribes and other weaker section.
47	Duty of the State to raise the level of nutrition and the standard of living and to improve public health
48	Organisation of agriculture and animal husbandry
48 A	Protection and improvement of environment and safeguarding of forests and wildlife
49	Protection of monuments and places and objects of national importance
50	Separation of judiciary from executive
51	Promotion of international peace security

FUNDAMENTAL DUTIES

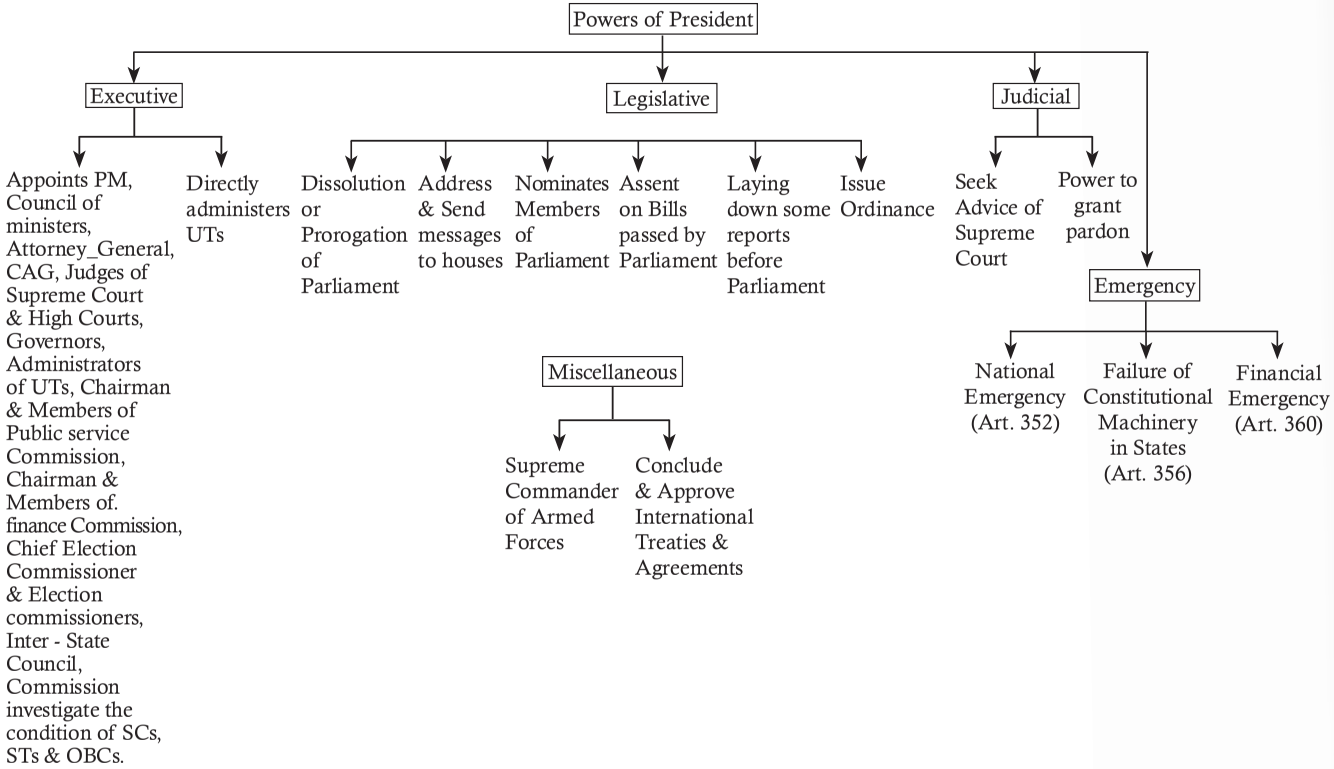
	Fundamental Duties
Covered	Part IV A, Article 51–A
Borrowed from	USSR
Amendment	42nd Amendment 1976, introduced Article 51 A in the constitution.
Recommended by	Swaran Singh Committee.
Numbers	Originally–10 duties Now–11 duties (added bye 86th Amendment ACT, 2002)
List of F.Ds	51 A (a) Abide by the Constitution and respect National Flag & National Anthem B Follow ideals of the freedom struggle C Protect sovereignty & integrity of India D Defend the country and render national services when called upon E Spirit of common brotherhood F Preserve composite culture G Protect natural environment H Develop scientific temper I Safeguard public property j Strive for excellence K Duty of all parents & guardians to send their children in the age group of 6-14 years to school..



$$\text{Value of vote of an MLA} = \frac{\text{Total population of state}}{\text{Total no. of elected members in the state legislative assembly}} \times \frac{1}{1000}$$

$$\text{Value of vote of an MP} = \frac{\text{Total value of votes of all MLAs of all states}}{\text{Total no. elected MPs}}$$

- At second stage, a complex system of calculating Quota of individual candidate is used which is based on the order of preference of candidates.


Powers of President
Executive
Legislative
Judicial
Appoints PM, Council of ministers, Attorney_General, CAG, Judges of Supreme Court & High Courts, Governors, Administrators of UTs, Chairman & Members of Public service Commission, Chairman & Members of. finance Commission, Chief Election Commissioner & Election commissioners, Inter - State Council, Commission investigate the condition of SCs, STs & OBCs.
Directly administers UTs
Dissolution or Prorogation of Parliament
Address & Send messages to houses
Nominates Members of Parliament
Assent on Bills passed by Parliament
Laying down some reports before Parliament
Issue Ordinance
Seek Advice of Supreme Court
Power to grant pardon
Emergency
National Emergency (Art. 352)
Failure of Constitutional Machinery in States (Art. 356)
Financial Emergency (Art. 360)
Miscellaneous
Supreme Commander of Armed Forces
Conclude & Approve International Treaties & Agreements

List of Presidents till date

List of President	Joining date	Leaving date
Dr.Rajendra Prasad	1/26/1950	5/13/1962
Sarvepalli Radhakrishnan	5/13/1962	5/13/1967
Zakir Hussain	5/13/1967	5/3/1969
Varahagiri Venkata Giri	5/3/1969	7/20/1969
Muhammad Hidayatullah	7/20/1969	8/24/1969
Varahagiri Venkata Giri	8/24/1969	8/24/1974
Fakhruddin Ali Ahmed	8/24/1974	2/11/1977
Basappa Danappa Jatti	2/11/1977	7/25/1977
Neelam Sanjiva Reddy	7/25/1977	7/25/1982
Giani Zail Singh	7/25/1982	7/25/1987
Ramaswamy Venkataraman	7/25/1987	7/25/1992
Shankar Dayal Sharma	7/25/1992	7/25/1997
Kocheril Raman Narayanan	7/25/1997	7/25/2002
A.P.J. Abdul Kalam	7/25/2002	7/25/2007
Smt. Pratibha Patil	7/25/2007	7/25/2012
Pranab Mukherjee	7/25/2012	Incumbent

Vice President

Qualification

(1) Citizen of India.
(2) Completed 35 years.
(3) Qualified for election as a member of of Rajya Sabha.
(4) Not hold any office of profit under Union/State government or any Local Authority.

Term

(1) 5 years.
(2) Elegible for re-election.

Oath

(1) Administered by the President.

Emoluments

(1) ` 1.25 Lakh per month salary.

Election

(1) Indirectly elected
(2) Elected by an electoral college consisting of the members of both Houses of Parliament & in accordance with the system of Proportional representation by means of the single transferable vote.

Functions

(1) Ex-officio chairman of Rajya Sabha.
(2) Suspend or adjourn the business of the House.(Rajya Sabha)
(3) Issues direction to the Chairman of various committees.
(4) Acts as President when vacancy occurs in the office of the President due to his resignation. Removal, death, or otherwise.

Removal

(1) He can be removed by a resolution of the Rajya Sabha passed by an absolute majority & agreed to by the Lok Sabha. But, no such resolution can be moved unless at least 14 days advance notice has been given.

Prime Minister

Appointment

(1) By President

Position

(1) Real executive authority (de facto executive).
(2) Head of the government.
(3) Leader of the majority party in the Lok Sabha.

Election

(1) Elected directly by the people.

Term

(1) 5 years
(2) The PM actually stays in office as long as he enjoy the confidence of the parliament, but the normal term is automatically reduced if the Lok sabha is dissolved earlier.

Powers

(1) Advise the president to summon & prorogue the Parliament & dissolve the Lok Sabha.
(2) Act as a Link between the cabinet & the President.
(3) All the members of the council of ministers are appointed by the president on the recommendations of the Prime Minister.
(4) Allocates Portfolios among the various ministers & reshuffles them.
(5) Presides over the meetings of the council of Ministers.
(6) Ask a minister to resign.
(7) Coordinates the policies of the various departments & Ministries.

List of Prime Ministers of India Till Date		Party Name
Narendra Modi	2014 till date	Bharatiya Janata Party
Manmohan Singh	2004-14	Indian National Congress
Atal Bihari Vajpayee	1998-2004	Bharatiya Janata Party
IK Gujral	1997-98	Indian National Congress
HD Deve Gowda	1996-97	Janata Dal (Secular)
AB Vajpayee	1996	Bharatiya Janata Party
PV Narasimha Rao	1991-96	Indian National Congress
Chandra Shekhar	1990-91	Samajwadi Janata Party
VP Singh	1989-90	Janata Dal (National Front)
Rajiv Gandhi	1984-89	Indian National Congress
Indira Gandhi	1980-84	Indian National Congress
Charan Singh	1979-80	Janata Dal (Secular)
Morarji Desai	1977-79	Janata Dal
Indira Gandhi	1966-77	Indian National Congress
Gulzarilal Nanda	1966-66	Indian National Congress
Lal Bahadur Shastri	1964-66	Indian National Congress
Gulzarilal Nanda	1964	Indian National Congress
Jawaharlal Nehru	1947-64	Indian National Congress

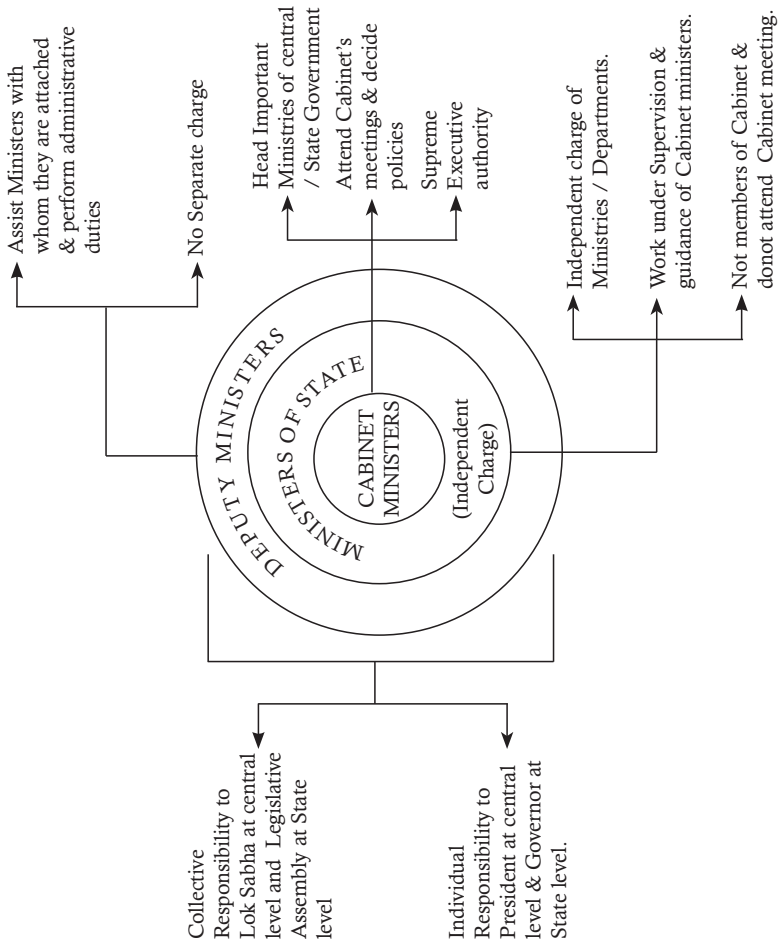
Governor

Position	• Chief Executive of the State. • Act as an head agent of the Central Government.
Qualification	• Citizen of India. • Completed 35 years. • Not hold any office of profit under government. • Not a member of Parliament or State legislature.
Appointment & Tenure	• Appointed by President. • Term is 5 years.
Oath	• Administered by chief justice of high court
Powers and Functions	• (A) Executive Powers – • Appoints Chief Minister & other ministers, Advocate General, chairman & Members of State PSC, State Election Commissioner & Finance Commission, Vice Chancellors of Universities in State. • Nominate one member of Anglo Indian Community to the legislative Assembly of his State & 1/6th members of Sate legislative council. • Recommend President that government of the Sate cannot be carried on in accordance with the Provisions of the Constitution. • (B) Legislative Powers – • Summon, adjourn & Prorogue State legislature & Dissolve the State legislative assembly. • Address the state legislature at the commencement of the first session after each general election and the first session of each year. • Give or withold Assent to the bill. • Return or reserve the Bill. • Submission reports from auditor General, State PSC, State finance commission before the legislature. • (C) Discretionary Powers – • Appointing a new Chief Minister when no Single Party Commands a clear-cut majority in legislative Assembly. • Dismissal of ministry if he is convinced that it has lost majority support. • (D) Other powers – • Grant Pardons & Suspend the sentence of any person but cannot Pardon in case of death sentence. • No demand of grants can be made except on the recommendation of the governor. • Ensures that Budget of State is laid before State legislature every year.

Chief Minister

Appointment	By Governor
Tenure	5 years
Qualification	Member of either house of the State legislature
Powers & Functions	(1) Chief link between the Governor & the council of Ministers. (2) Head of the Council of Ministers. (3) Recommends to the Governor the names of persons to be appointed as members of the Council of Ministers (4) Allocates portfolios among Ministers. (5) Supervises & coordinates Policies of the several Ministries & Departments.

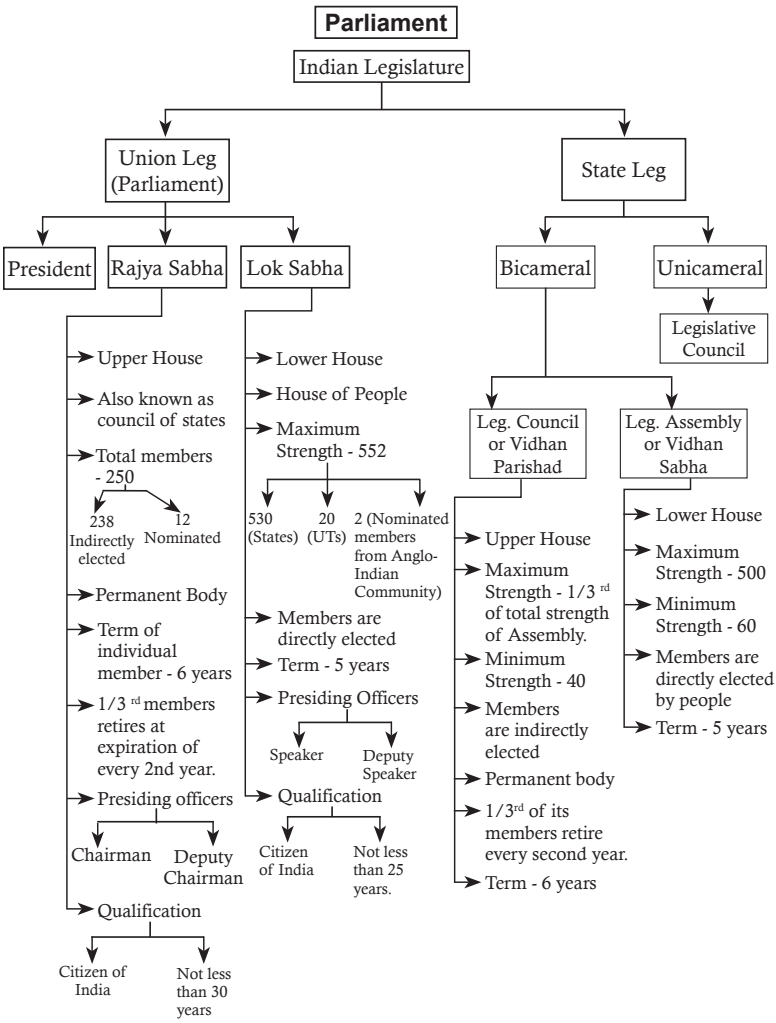
COUNCIL OF MINISTERS (AT CENTRE & STATE LEVEL) : COMPOSITION

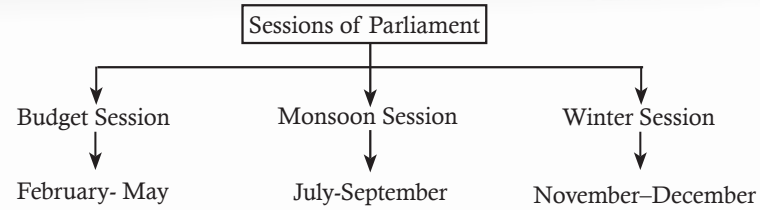


COUNCIL OF MINSTERS IN 12TH FIVE YEAR PLAN		
Prime Minister		
	Shri Narendra Modi	Personnel, Public Grievances and Pensions Department of Atomic Energy Department of Space
Cabinet Ministers		
1	Shri Raj Nath Singh	Home Affairs
2	Smt. Sushma Swaraj	External Affairs Overseas Indian Affairs
3	Shri Arun Jaitley	Finance Corporate Affairs Information & Broadcasting
4	Shri M. Venkaiah Naidu	Urban Development Housing and Urban Poverty Alleviation Parliamentary Affairs
5	Shri Nitin Jairam Gadkari	Road Transport and Highways Shipping
6	Shri Manohar Parrikar	Defence
7	Shri Suresh Prabhu	Railways
8	Shri D. V. Sadananda Gowda	Law & Justice
9	Sushri Uma Bharati	Water Resources, River Development and Ganga Rejuvenation
10	Dr. Najma A. Heptulla	Minority Affairs
11	Shri Ram Vilas Paswan	Consumer Affairs, Food and Public Distribution
12	Shri Kalraj Mishra	Micro, Small and Medium Enterprises
13	Smt. Maneka Sanjay Gandhi	Women and Child Development
14	Shri Ananth Kumar	Chemicals and Fertilizers
15	Shri Ravi Shankar Prasad	Communications and Information Technology
16	Shri Jagat Prakash Nadda	Health and Family Welfare
17	Shri Ashok Gajapathi Raju Pusapati	Civil Aviation
18	Shri Anant Geete	Heavy Industries and Public Enterprises
19	Smt. Harsimrat Kaur Badal	Food Processing Industries
20	Shri Narendra Singh Tomar	Mines, Steel
21	Shri Chaudhary Birender Singh	Rural Development Panchayati Raj Drinking Water and Sanitation
22	Shri Jual Oram	Tribal Affairs
23	Shri Radha Mohan Singh	Agriculture
24	Shri Thaawar Chand Gehlot	Social Justice and Empowerment
25	Smt. Smriti Zubin Irani	Human Resource Development
26	Dr. Harsh Vardhan	Science and Technology Earth Sciences
Ministers of State (Independent Charge)		
1	General V. K. Singh	Statistics and Programme Implementation External Affairs Overseas Indian Affairs

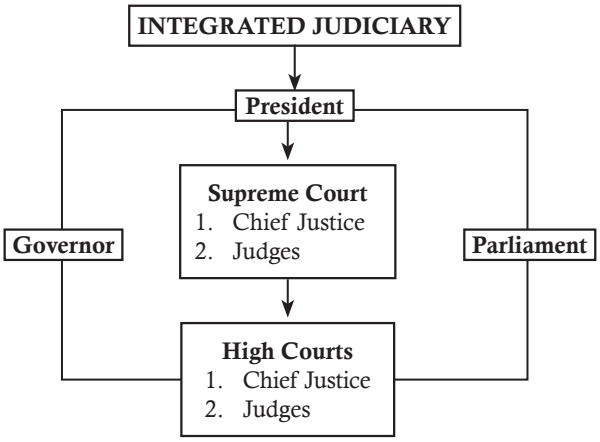
2	Shri Inderjit Singh Rao	Planning Defence
3	Shri Santosh Kumar Gangwar	Textiles
4	Shri Bandaru Dattatreya	Labour and Employment
5	Shri Rajiv Pratap Rudy	Skill Development & Entrepreneurship Parliamentary Affairs
6	Shri Shripad Yesso Naik	AAYUSH Health & Family Welfare
7	Shri Dharmendra Pradhan	Petroleum and Natural Gas
8	Shri Sarbananda Sonowal	Shri Sarbananda Sonowal
9	Shri Prakash Javadekar	Environment, Forest and Climate Change
10	Shri Piyush Goyal	Power Coal New and Renewable Energy
11	Dr. Jitendra Singh	Development of North Eastern Region Prime Minister's Office Personnel, Public Grievances & Pensions Department of Atomic Energy Department of Space
12	Smt. Nirmala Sitharaman	Commerce and Industry
13	Dr. Mahesh Sharma	Culture Tourism Civil Aviation
	Ministers of State	
1	Shri Mukhtar Abbas Naqvi	Minority Affairs Parliamentary Affairs
2	Shri Ram Kripal Yadav	Drinking Water and Sanitation
3	Shri Haribhai Parthibhai Chaudhary	Home Affairs
4	Shri Sanwar Lal Jat	Water Resources River Development and Ganga Rejuvenation
5	Shri Mohanbhai Kalyanjibhai Kundariya	Agriculture
6	Shri Giriraj Singh	Micro, Small & Medium Enterprises
7	Shri Hansraj Gangaram Ahir	Chemicals & Fertilizers
8	Shri G. M. Siddeshwara	Heavy Industries and Public Enterprises
9	Shri Manoj Sinha	Railways
10	Shri Nihalchand	Panchayati Raj
11	Shri Upendra Kushwaha	Human Resources Development
12	Shri Radhakrishnan P	Road Transport & Highways, Shipping
13	Shri Kiren Rijiju	Home Affairs
14	Shri Krishan Pal	Social Justice & Empowerment
15	Dr. Sanjeev Kumar Balyan	Agriculture
16	Shri Mansukhbhai Dhanjibhai Vasava	Tribal Affairs
17	Shri Raosaheb Dadarao Danve	Consumer Affairs, Food and Public Distribution
18	Shri Vishnu Deo Sai	Mines Steel

19	Shri Sudarshan Bhagat	Rural Development
20	Prof. (Dr.) Ram Shankar Katheria	Human Resource Development
21	Shri Y. S. Chowdary	Science and Technology Earth Science
22	Shri Jayant Sinha	Finance
23	Col. Rajyavardhan Singh Rathore	Information & Broadcasting
24	Shri Babul Supria (Babul Supriyo) Baral	Urban Development Housing and Urban Poverty Alleviation
25	Sadhvi Niranjan Jyoti	Food Processing Industries
26	Shri Vijay Sampla	Social Justice & Empowerment





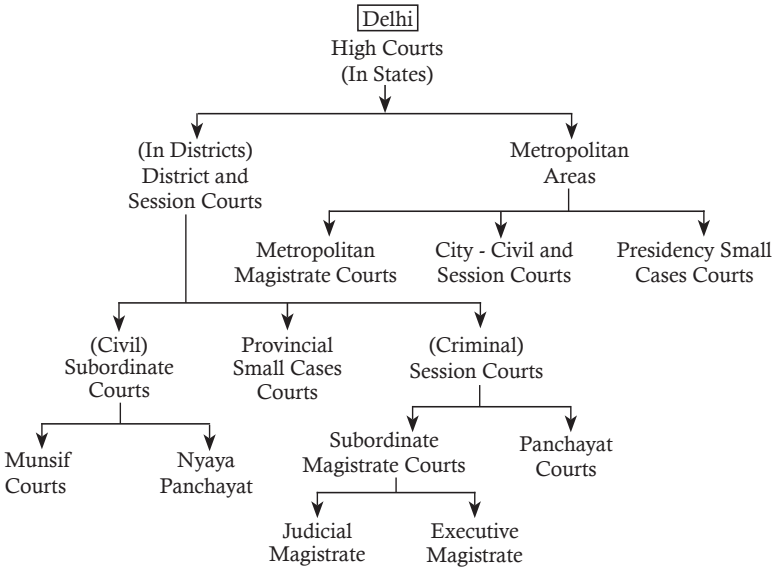
Indian Judicary



COURTS

The Supreme Court

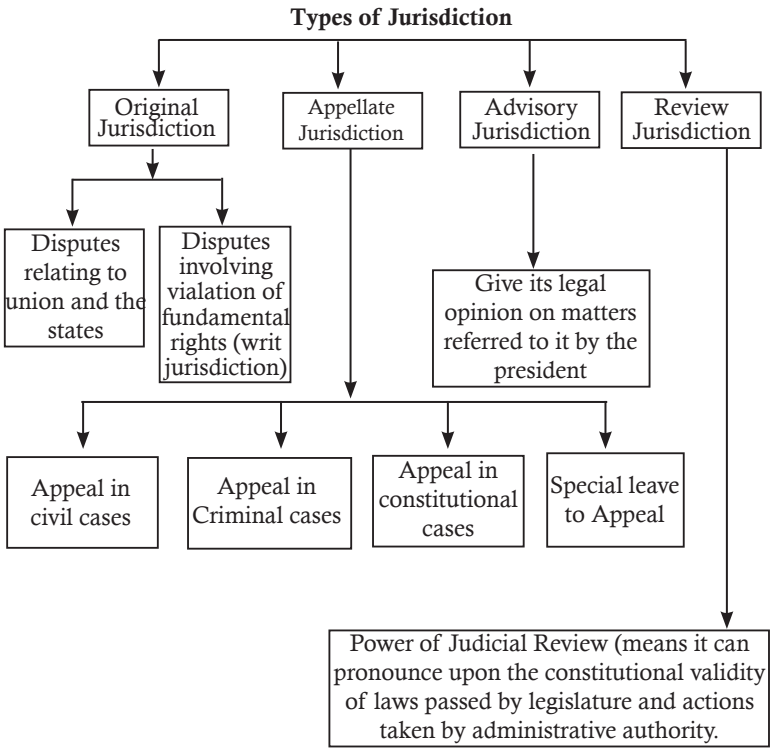
Delhi



Supreme Court

- Supreme court is the final interpreter & guardian of our constitution. It is the highest court of appeal in India.
- Presently there are 31 judges (including Chief justice) in Supreme Court.
- The CJI is appointed by the President. The present CJI is Hon'ble Mr. TS Thakur.
- There is no fixed period of office for SC judges. Once appointed, they hold office till the age of 65 years.
- A judge of SC can be removed from his office only by the process of impechment.
- According to Article 129, SC is a "Court of Record". It means:-
  (a) Court records are admitted to be of evidentiary value.
  (b) It can punish for Contempt of the court.
- Qualification for appointment as a Judge of SC :-
  (1) Citizen of India.
  (2) Either be a distinguished jurist, or one who has been a High Court Judge for atleast 5 years or an advocate of a High Court (or 2 or more such courts in Succession) for atleast 10 years.

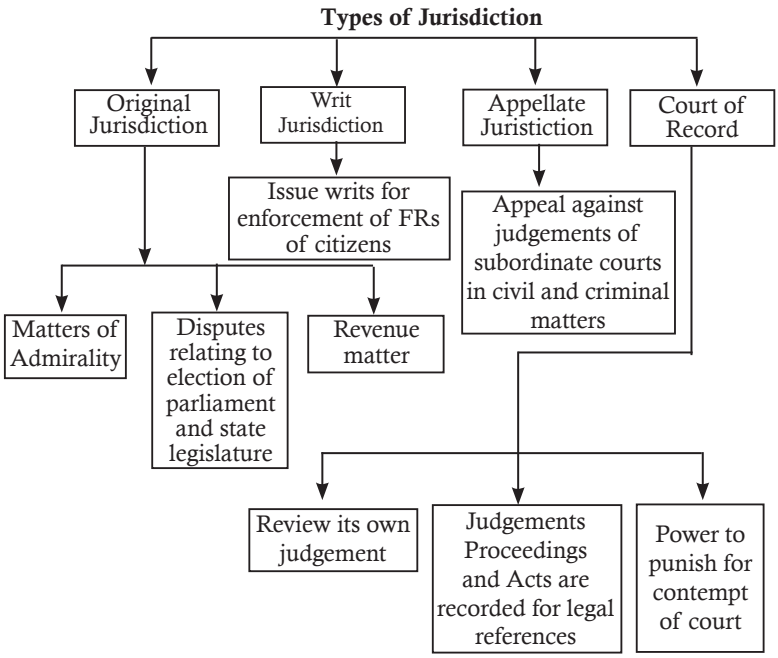
JURISDICTION OF SUPREME COURT



High Court

- The judiciary in a State consists of a HC & a hierarchy of Subordinate courts.
- The judges of HC are appointed by the President .
- The judge of a HC holds office until he attains the age of 62 years. He can be removed by the process of Impeachment.
- Qualification a person appointed as a judge of HC should
  (1) Citizen of India.
  (2) Held a judicial office in the territory of India for 10 years or have been on advocate a high court for 10 years.

JURISDICTION OF HIGH COURT



Crime

The Indian Penal Code was passed in the year 1860 and came into effect from January 1, 1862. The Indian Penal Code applies to the whole of India except for the state of Jammu & Kashmir. It contains 23 Chapters and 511 Sections. Before the Indian Penal Code came into effect, the Mohammedan Criminal Law was applied to both Mohammedans and Hindus in India.

Broad classification of crimes under the Indian Penal Code (IPC)

1. Crimes Against Body: Murder, Its attempt, Culpable Homicide not amounting to Murder, Kidnapping & Abduction, Hurt, Causing Death by Negligence;
2. Crimes Against Property: Dacoity, its preparation & assembly, Robbery, Burglary, Theft;

3. Crimes Against Public order: Riots, Arson;
4. Economic Crimes: Criminal Breach of Trust, Cheating, Counterfeiting;
5. Crimes Against Women: Rape, Dowry Death, Cruelty by Husband and Relatives, Molestation, Sexual harassment and Importation of Girls;
6. Crimes Against Children: Child Rape, Kidnapping & Abduction of Children, Procreation of minor girls, Selling/Buying of girls for Prostitution, Abetment to Suicide, Exposure and Abandonment, Infanticide, Foeticide;
7. Other IPC crimes.

Few Known Sections

Section 120: Concealing design to commit offence punishable with imprisonment
Section 120-A and B: Definition of criminal conspiracy and Punishment of criminal conspiracy
Section 141: unlawful assembly
Section 146 and 147: Rioting and Punishment for rioting
Section 169: Public servant unlawfully buying or bidding for property
Section 171-B: Bribery
Section 279: Rash driving or riding on a public way
Section 295: Injuring or defiling place of worship with intent to insult the religion of any class
Section 298: Uttering, words, etc., with deliberate intent to hurt the religious feelings of any person
Section 300: Murder
Section 304-B: Dowry death
Section 307: Attempt to murder
Section 317: Exposure and abandonment of child under twelve years, by parent or person having care of it.
Section 369: Kidnapping or abducting child under ten years with intent to steal from its person
Section 372: Selling minor for purposes of prostitution, etc.
Section 373: Buying minor for purposes of prostitution, etc.
Section 378 : Theft
Section 375: Rape
Section 376: Punishment against rape
Section 383: Extortion
Section 390: Robbery
Section 397: Robbery, or dacoity, with attempt to cause death or grievous hurt

LEGAL TERMS

Affidavit: This is a sworn statement made by a party, in writing, made in the presence of an oath commissioner or a notary public which is used either in support of applications to the Court or as evidence in court proceedings.

Alimony : The maintenance given by a husband to his divorced wife.

Amicus curiae : Translated from the Latin as 'friend of the Court'. An advocate appears in this capacity when asked to help with the case by the Court or on volunteering services to the Court.

Arbitration : Settling disputes by referring them to independent third parties as an alternative to court proceedings.

Audi alteram partem : This is a rule of natural justice which translates from the Latin as 'hear the other side' or 'hear both sides'.

Bequeath : To dispose of personal property by Will.

Caveat : Where it is apprehended that an opposite party may file a case, a party may file a document requesting the court that no order be made in the case without hearing the caveator.

Cognizable offence : An offence in which arrest can be made without a warrant.

Dasti Notice : Dasti is a persian word, which means 'by hand'. Dast Notice means service of the notice by the Petitioner on the Respondent(s) in person, and not by the Registry through post.

Decree : The formal expression of an adjudication which, so far as regards the Court expressing it,

Estoppel : A legal principle that bars a party from denying or alleging a certain fact owing to that party's previous conduct, allegation, or denial.

Habeas Corpus : A writ requiring a person under arrest to be brought before a judge or into court, especially to secure the person's release unless lawful grounds are shown for their detention.

In pari delicto : When both the parties are equally in fault.lk

Interim Order : Any order by a court before a final order is made.

Interlocutory Application : Petition seeking a relief even while the main petition remains in the Court.

Intervenor : A person who is not a party to the proceedings may, with the permission of the court, intervene if it is shown that the outcome of the case will affect such person in some way.

Judgment-debtor : Any person against whom a decree has been passed or an order capable of execution has been made;

Judicial Review : A term that describes the function of the judiciary being able to examine and correct the actions of all the organs of State—the executive, the legislature and the judiciary itself.

Justiciable : A matter is justiciable if it lends itself to adjudication by a court. This is determined by criteria laid down in law.

Litigation : The totality of the legal proceedings in any dispute.

Locus Standi : Translated from Latin as 'place of standing', locus standi gives the right to pursue a litigation. Under this rule, only a person or group of persons affected by the issue may **petition the Court.**

Ordinance : A codified law made, as a temporary measure, by the President of India or the Governor of a State when the Parliament or legislature of a state is not in session.

Perjury : This occurs when a person gives false evidence or false affidavit in a case.

Petition : A written document filed in a court asserting a claim or a right and seeking relief on legal grounds.

Pleadings : A collective noun for all the petitions, affidavits, replies, rejoinders drafted by or on behalf of the parties to a case.

Prima facie : At first sight; on the face of it.

Pro bono publico : Translated from the Latin as 'for the public good'. In PIL, this refers to a petitioner acting bonafide in the public interest.

Respondent : A party against whom a petition is filed. A proforma respondent is a party against whom no relief is sought.

Stare decisis : The principle that decisions of Courts in previous cases must be followed in subsequent cases of similar nature.

Statute : A codified law that is enacted by the Parliament or a State Legislature.

Stay Order : A party filing a petition may require some immediate relief, even before the respondents can be heard or a final decision given.

Suo Motu : The Court may take action on its own when facts requiring legal

intervention reach its notice. The Court is then said to be acting suo moto.

Void : One that law regards as never having taken place.

Vox populi : Translated from the Latin as 'the voice of the people'.

Writ : A writ is a direction that the Court issues, which is to be obeyed by the authority/person to whom it is issued.

Writ Petition : A petition seeking issuance of a writ is a writ petition.

Panchayati Raj Institution (PRI)

The term Panchayati Raj (PRI) in India signifies the system of rural local self government. It has been established in all the States of India by the Acts of the state Legislatures to build democracy at the grassroot level. It is entrusted with rural development. It was constitutionalised through the 73rd Constitutional Amendment Act 1992.

COMMITTEES ON PANCHAYATI RAJ

Committee	Year	Important Recommendations
1. Balwant Rai Mehta	1957	• Three – tier Panchayati Raj System – Gram Panchayat at Village level, Panchayat Samiti at Block level & Zila Parishad at district level.
2. Ashok Mehta	1977	• Two – tier PR System – Mandal Panchayats at Village level & Zila Panchayat at district level. • Official representation of Political Parties at all levels of Panchayat elections. • Seat for SCs & STs should be reserved. • Constitutional recognition to PRIs.
3. GVK Rao	1985	• Regular elections to the PRIs.
4. LM Singhvi	1986	• Regular, Free & fair elections to PRIs. • Establishment of Nyaya Panchayats. • More financial resources to village Panchayats.

Constitutionalisation

73rd Amendment Act 1993

The Parliament has passed 73rd and 74th Constitutional Amendment Acts in 1993 to ensure the effective participation of rural & urban people in the institutions of local Self government.

- Added part -IX (Articles 243 to 243-0) & the 11th Schedule to the Constitution.
- 11th Schedule contains 29 functional items & deals with Article 243 – G.
- The important provisions of 73rd **Constitutional Amendment Act are as Follows –**

1. It made mandatory to hold the elections of Panchayats in due time on regular basis.
2. Reservation of seats for women, SCs, STs & OBCs in Panchayats, at all levels.
3. Elections to the panchayats shall be held with in a period of 6 months from the date of dissolution.
4. Members of Block Panchayat & Zilla Panchayats are to be elected by people directly along with the election of members of Gram Panchayat. The heads of Gram Panchayat shall be elected by the directly elected members of these bodies.
5. Establishment of an independent State Election commission in every State.

6. Power to the Panchayats to impose and collect taxes in accordance with the provisions made by the State government.
7. Establishment of a State Finance Commission.
8. Prepare & implement the plans for economic development.

Municipalities

For the establishment of self-government in urban areas urban bodies have been established. The urban institutions have been granted constitutional status by **74th constitutional Amendement** (enforced with effect from January 1,1993). In the **Part IX A** of the Constitution the provisions for Municipalities have been made from Article 243 P to 243 ZG. Besides a 12th Schedule also has been incorporated in the Constitution, which contains 18 subjects relating to the jurisdiction of Municipalities.

As per this Constitutional Amendment 3 types of urban institutions have been established on the basis of population they are –

1. Nagar Panchayat for a transitional area.
2. Municipal council for a smaller urban area.
3. Municipal corporation for a larger urban area.

Centre – State Relations

The basic provisions regarding the distribution of powers between the central & provincial governments are in Part XI & XII of the Constitution. Both the Union & the States derive their authority from the Constitution, which divides all powers Legislative, executive & financial between them. Our Constitution makers elaborate provisions to govern centre state relations. A total of 56 Articles, from Article 245 to 300 deal with the centre state relations.

Committees Appointed to study Centre -state relation.

1. Setalvad committee (1966).
2. Rajamannar committee (1969)
3. Sarkaria committee (1983).

Division of Legislative Powers between Centre & the States

I. Three Lists

1. Union List – List I – 97 subjects
2. State List – List II – 66 subjects
3. Concurrent List – List III – 52 subjects

IMPORTANT SUBJECTS IN VARIOUS LISTS

Union List (List I)

1. Atomic energy and mineral resources.
2. Extradition.
3. Banking.
4. Insurance.
5. Stock exchanges and futures markets.
6. Patents, inventions and designs; copyright; trade-marks and merchandise marks.
7. Census.
8. Corporation tax.
9. Any other matter not enumerated in List II or List III including any tax not mentioned in either of those lists.

State List (List II)

1. Public order.
2. Local government.
3. Public health and sanitation.
4. Libraries, museums and other similar institutions.
5. Agriculture.
6. Fisheries.
7. Gas and gas-works.
8. Markets and fairs.
9. Captivation taxes.

Concurrent List (List III)

1. Criminal law.
2. Criminal procedure.
3. Preventive detention.
4. Marriage and divorce.
5. Transfer of property other than agricultural land.
6. Contracts.
7. Civil procedure.
8. Contempt of court, but not including contempt of the Supreme Court.
9. Prevention of cruelty to animals.
10. Economic and social planning.
11. Legal, medical and other professions.
12. Electricity.
13. Archaeological sites.

II. Inter state Council

Inter–State Council is one of the important extra judicial bodies formed in 1990 on the recommendation of Sarkaria Commission. The Article 263 of Constitution empowers the President to appoint or establish an Inter–State Council for (1) enquiring into & advising upon inter–state disputes. (2) Investigate & Discuss on subjects in which states alone or states & union have common interest. The Council is headed by the Prime Minister & its members include 6 Cabinet Ministers & Chief Ministers of States.

III. Zonal Council

Zonal Councils were constituted on the recommendation of States Reorganization Commission 1956. In 1956, five zonal councils were established – North, South, East, West & Central. In 1971, the 6th zonal council was established i.e. North–east zonal council. Its objectives are:–

(a) To promote collective approach & sorting out common problems of the member states.

(b) For providing cooperation for the implementation of development plans & progress.

Composition : The Union Home Minister is the ex–officio chairman of all the Zonal Councils. Each Zonal council includes the Chief Ministers of the member states & the Administrators of the Union Territories. The chief secretaries of the member states are also included.

Uniform Civil Code

No specific definition is available on UCC. All we know is that some common law covering issues relating to marriage, succession and property is called Uniform Civil Code but what these laws would be is anyone's guess. In article 44, our constitution clearly specifies the UCC: "The State shall endeavour to secure the citizen a Uniform Civil Code throughout the territory of India". The constitution is thus, very clear that unless a uniform civil code is followed, integration cannot be imbibed. However, the fact is that it is only a "directives principle" laid down in the constitution and as Article 37 of the Constitution itself makes clear, the directive principles "shall not be enforceable by any court". Nevertheless, they are "fundamental in the governance of the country". This shows that although our constitution itself believes that a Uniform Civil Code should be implemented in some manner, it does not make this implementation mandatory. Hence, the debate on having a uniform civil code for India still continues. The demand for a uniform civil code essentially means having one set of laws that will apply to all citizens of India irrespective of their religion. Though the exact contours of such a uniform code have not been spelt out, it should presumably incorporate the

most modern and progressive aspects of all existing personal laws while discarding those which are retrograde.

Article 370

Under Article 370 of the Indian Constitution, Jammu & Kashmir is granted autonomy. It is a 'temporary provision' that accords special status to the state. All the provisions of the Constitution are not applicable to J&K, unlike other states. Except finance, defence, communications, and foreign affairs, central government needs the state government's consensus for applying all other laws. Because of this article, residents of Kashmir follow separate set of laws in terms of citizenship, property ownership, and other rights.

Moreover, as per Article 370, the power of Parliament to make laws for the said State is "limited to those matters in the Union List and the Concurrent List." It doesn't have the authority to increase or reduce the borders of the state. For those uninitiated, the article was drafted by N. Gopalaswami Ayyangar in 1949 against the wish of Dr BR Ambedkar, who found it discriminatory and against the interest of India. Despite Jawaharlal Nehru's promise that Article 370 will be gradually abrogated, it has not happened even after more than six decades have whiled away.

It is not known to many that the article 370 has been eroded time and again due to a series of Presidential Orders. These orders over a period of time have made almost all Union laws applicable to J&K. Today, the state is within the "scope and jurisdiction" of almost every institution of India.

How J&K Different from Other States?

- Directive Principles of State Policy (DPSP) are not applied to J&K but applied to other states. DPSP = states are required to do some things for the welfare of community.
- President can't declare financial emergency (salaries and allowances reduction etc.) in relation to J&K.
- High Court of J&K can issue writs only for enforcement of Fundamental Rights.
- Right to property is still guaranteed in J&K.
- Permanent residents of J&K have some special fundamental rights.
- Although Supreme Court, EC and CAG are applicable to J&K along with all other states.

CONSTITUTIONAL BODIES

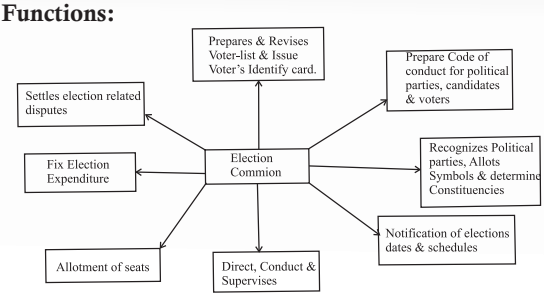
Election Commission

It is a permanent & an independent body established by the Constitution of India directly to ensure free & fair elections in the country. Elections to Parliament, State legislatures, President & Vice–President are vested in it.

Composition: The Election Commission consists of a Chief Election Commissioner & such other commissioners as the President may, form time to time, decide.

Appointment & Term: The CEC & other Election Commissioners are appointed by the President for a term of 6 years. The Regional Commissioners may also be appointed by the President in consultation with the Election Commission for assisting the Election Commission. The CEC can be removed from office before expiry of his term by the President on the basis of a Resolution passed by the Parliament by a special majority on the ground of proved misbehavior or incapacity. The other Election Commissioners may be removed by the President on the recommendation of the CEC.

Powers & Functions:



Current Chief Election Commissioner is Mr. Nasim Zaidi

Public Service Commissions

I. Union Public Service Commissions (UPSC)

- Independent Constitutional body.
- Recruitment of civil servants at the union level.
- Chairman & members are appointed by the President & have tenure of 6 years or until age of 65 years.
- The President can also remove them before expiry of their term on grounds of proved misbehaviour. The President can issue orders for the removal of the members of the UPSC only after the Supreme court makes such a recommendation on the basis of an enquiry.

Functions:

1. Conduct examinations for appointment to the services of the union.
2. Assists the states in framing & operating schemes of joint recruitment.
3. Advises the President of India–
   (a) All matters relating to methods of recruitment in civil services & for civils posts.
   (b) Suitability of Candidates for appointments for promotions.
   (c) On all disciplinary matters person serving under the goverment of India.
4. Presents annually to the President a report on its performance. The President places this report before both the Houses of Parliament.

II. State Public Service Commission

- Recruitment of Civil Services at the state level.
- Two or more states, if parliament provides by law, may have a Joint Public Service Commission.
- Service conditions of SPSC's members are determined by Governor whereas service conditions of Joint PSC are determined by President.
- Chairman & members of SPSC are appointed by Government & in case of JPSC by the President.
- Chairman & members of SPSC & JPSC have tenure of 6 years or until age of 62 years.
- Members may resign by writing to Governor. It is only the President who can make a reference to the Supreme Court & make an order of removal in pursuance of the report of the Supreme court.

Functions

1. Conduct examinations for appointments to the services of the state.

2. Advise on matter that may be referred by the Governor.
3. Present Annual report to the Governor who shall cause it to be laid before the state legislature.
4. Any other function that state legislature may by law assign.

Finance Commission

An instrument which the constitution has evolved for the purpose of distributing financial resources between centre & states is the Finance Commission,. According to Article 280 of the Constitution, it is to be constituted by the President once every 5 years consisting of a chairman & four other members appointed by the President.

Functions

The duty of the Commission is to make recommendations to the President as to–

1. The distribution between the Union & the States of the net proceeds of taxes which are to be divided between them and the allocation between the states themselves of the respective shares of such proceeds.
2. The principles which should govern the grant– in–aid of the revenue of the states out of the Consolidated fund of India.
3. The measures needed to augment the consolidated fund of a state to supplement the resources of the Panchayats & the Muncipalities in the state on the basis of the recommendation by the State Finance Commission.
4. Any other matter referred to the commission by the President in the interests of sound finances.

National Commission for Scheduled Castes & Tribes

The President has power to appoint a National Commission for SCs & STs. The Commission shall consist of a Chairman, a Vice–Chairman & 5 other members. This Commission was given contitutional status by the 65th Amendment Act 1990.

Functions

1. To investigate & monitor all matters relating to the safeguards provided for SCs & STs under the Constitution of India & to evaluate the working of such safeguards.
2. To enquire specific complaints with respect to the deprivation of rights & safeguards of SCs & STs.
3. To submit its Annual Report to the President.

National Commission for Backward Classes

Article 340 empowers the President to appoint a Commission to investigate the conditions of the socially & educationally backward classes. The Commission recommends removal of all difficulties of Backward Classes & raising them to a higher social, educational & economic standard.

After constitution was adopted two 'Backward Class Commissions' were appointed – (1) Kaka Saheb Kalelkar Committee & (2) B.P. Mandal Committee.

Comptroller & Auditor – General (CAG)

The CAG is the custodian of public purse & controls the entire financial system of the country. He is appointed

by the President for a period of 6 years or till he attains the age of 65 years whichever is earlier. It is his duty to see that no money is spent out of the Consolidated fund of India or of a State without the authority of the appropriate legislation. The reports of the CAG are presented to the President or the Governor, as the case may be, & laid before the Parliament & the respective State legislatures. In Lok Sabha, the Public Accounts Committee considers this Report.

The current CAG of India is Shashikant Sharma.

Functions

He can audit & report on:–

1. All expenditure from consolidated fund of India & each state & each Union Territories having a legislative Assembly & see whether expenditure has been in accordance with the law.
2. All expenditure from the Contingency Funds & Public Accounts of the Union & the states.
3. All trading, manufacturing, profit & loss accounts etc.., Kept by any Department of the Union or a State.
4. The receipts & expenditure of the Union & of each state to satisfy himself that the rules & procedures are designed to secure an effective check on the assessment, Collection & proper allocation of revenue.
5. The receipts & expenditure of all bodies & authorities substantially financed from the Union or state Revenues.

Attorney General (AG)

The AG is the highest legal officer of the Goverment of India. He is appointed by the President & holds office during the pleasure of the President. He must have the same qualifications as are required to be a judge of the Supreme Court.

Though the AG of India is not a member of the Cabinet, he shall have the right to address in the House of Parliment but shall have no right to vote. In the performance of his official duties the AG is entited to audience in all Courts in the territory of India.

Functions:

1. Give advice on all such legal matters & to perform all such other duties of a legal character as may, from time to time, be referred to him by the President.
2. Discharge the functions conferred on him by the constitution or any other law for the time being in force.
3. Appear before the Supreme Court & various High Courts in cases involving the Goverment of India.

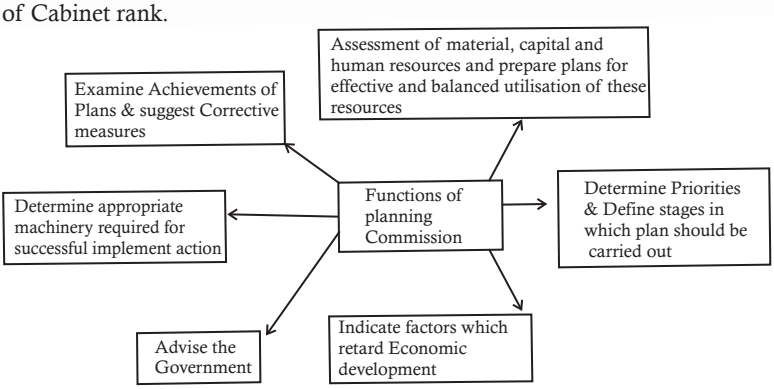
Advocate General

Each state shall have an Advocate General. He is the state's counter part of the Attorney General of India. He is appointed by the Governor of the State who holds office during the pleasure of the Governor. A person qualified to be a High Court Judge can be appointed Advocate– General. He has the right to address & take part in the proceedings of the House of the State Legislature. But he has no right to vote. His functions are similar to those of the Attorney – General.

NON–STATUTORY BODIES

PLANNING COMMISSION

The Planning Commission of India was established on March 15, 1950 on the basis of a resolution of the Cabinet to that effect. It is a non–statutory/ extra constitutional body. Prime Minister is the ex–officio Chairman of the Planning Commission. The Deputy Chairman of planning Commission is of Cabinet rank.



National Development Council (NDC)

NDC is one of the key organizations of the Planning system in India. It was set up by a resolution of Central goverment on August 6, 1952. It is an extra–constitutional body. It is described as a Super Cabinet. It should meet atleast twice every year.

Composition = Prime minister (Chairman) + Chief Minister of all states + Administrators of all union territories

All Union Cabinet Ministers + Members of Planning Commission

Objectives

- Strengthen & mobilize the efforts for national planning & the national resources.
- Prescribe common economic policies.
- Ensure rapid & balanced economic development of all parts of country.

Functions

- Lays down the guidelines for the formulation of 5 year plans.
- Approving & Reviewing the Plan from time to time.
- Securing Corrdinated implementation of the plans.
- Consider important questions of social & economic policy affecting national development.

NITI Aayog

The government of India has replaced Planning Commission with a new institution named NITI Aayog (National Institution for Transforming India).

The institution will serve as 'Think Tank' of the Government - a directional and policy dynamo.

NITI Aayog will provide Governments at the Central and State Levels with relevant strategic and technical advice across the spectrum of key elements

of policy, this includes matters of national and international importance on the economic front, dissemination of best practices from within the country as well as from other nations, the infusion of new policy ideas and specific issue-based support.

Composition: NITI Aayog will have Prime Minister as its chairman, one Vice-Chairman cum chief-executive officer, 5 fulltime members and 2 part time members, apart from 4 central government ministers.

Lokpal

In India, the institution of Ombudsman (Swedish word meaning Commissioner) has given the name of Lokpal & use it as an anti-corruption institution. The Dictionary defines the Ombudsman as 'an official to investigate complaints by individual against maladministration by public authorities. Lokpal is visualised as the country's watch dog. The idea of creating Lokpal was first conceptualized in 1968 in 4th Lok Sabha. Thereafter in 1971, 1977, 1985, 1989, 1996, 1998 & 2001 efforts were made to enact legislation to create the institution of Lokpal. The Bill received Parliaments assent on 1st Jan 2013.

The Bill as passed by Parliament creates a Lokpal at the centre which shall consist of a chairperson & upto 8 members. Half of these members should have higher judicial experience & other half should have experience in public administration, finance, insurance & banking laws, anti corruption & vigilance. It also provides that half the members of Lokpal shall be from amongst SCs, STs, OBCs, minority & women.

The chairperson & members of Lokpal shall be appointed by a Selection Committee consisting of PM, Speaker of Lok Sabha, Leader of Opposition in Lok Sabha, Chief Justice of India & an eminent jurist to be nominated by the President based on the recommendations of the other members of the Selection Committee.

The jurisdiction of Lokpal extends to the PM, Ministers, Current & former MPs & members of legislative assemblies, government employees & employees of companies funded or controlled by the control or state government.

It specifies a time limit of 60 days for completion of inquiry & 6 months for completion of investigation by CBI.

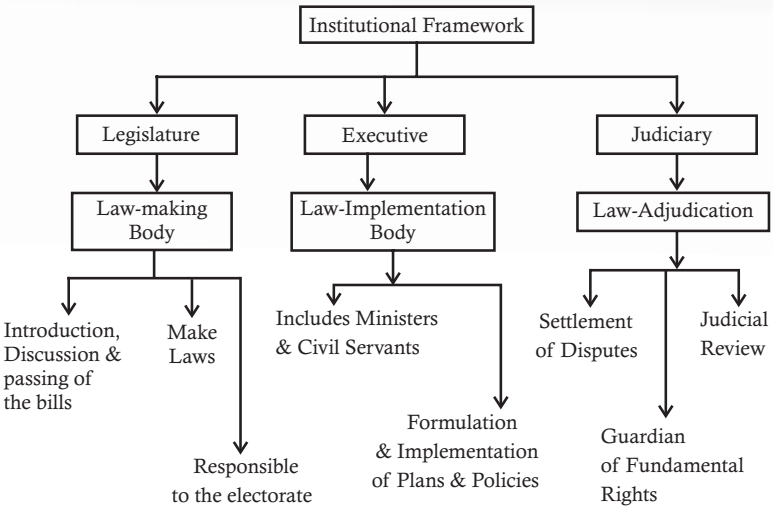
Lokayukta

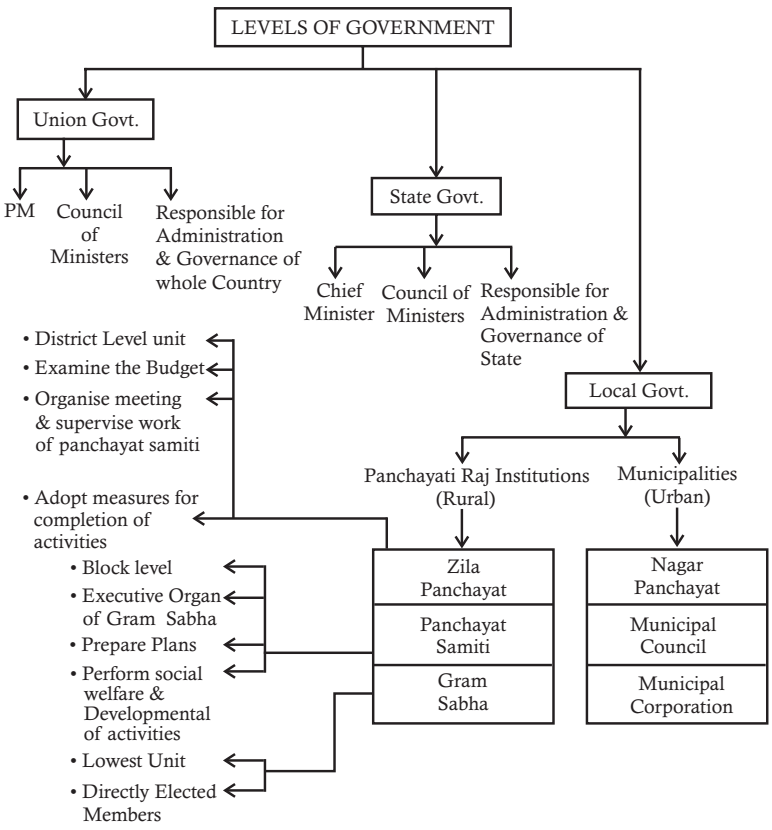
The anti-corruption institution of Lokayukta is set up at the state level. He is appointed by the Governor of the state. In most of the states, the term of office fixed for Lokayukta is of 5 years duration or 65 years of age, whichever is earlier.

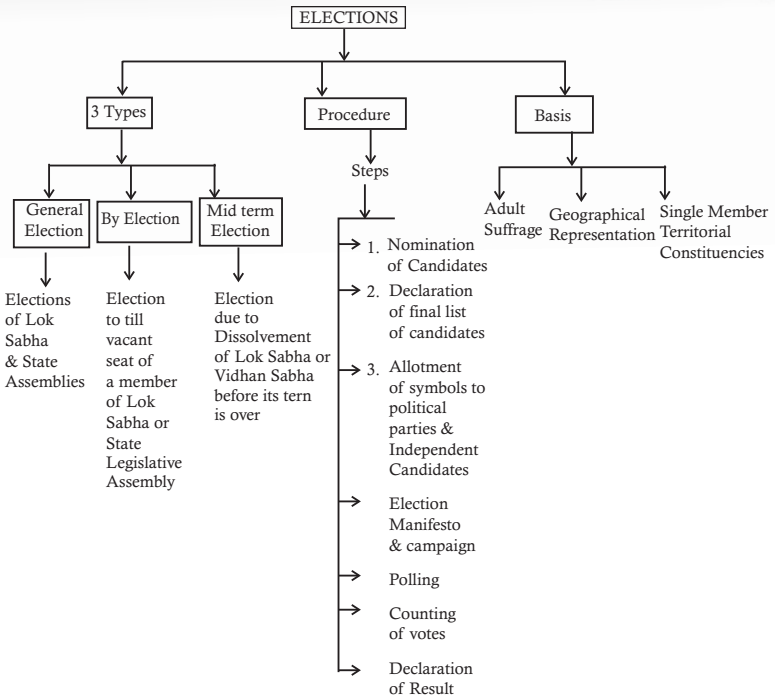
National Human Rights Commission (NHRC)

NHRC is a statutory body, established in 1993, to act as the watch dog of human rights in the country, that is the rights relating to life, liberty, equality & dignity of the individual guaranteed by the constitution or embodied in the international covenants & enforceable by courts in India. The commission is a multi-member body consisting of a chairman and four members. The Chairman and members are appointed by the President. They hold office for a term of 5 years or until they attain the age of 70 years.

INDIAN GOVERNMENT


Institutional Framework
Legislature
Executive
Judiciary
Law-making Body
Law-Implementation Body
Law-Adjudication
Introduction, Discussion & passing of the bills
Make Laws
Responsible to the electorate
Includes Ministers & Civil Servants
Formulation & Implementation of Plans & Policies
Settlement of Disputes
Judicial Review
Guardian of Fundamental Rights


LEVELS OF GOVERNMENT
Union Govt.
PM
Council of Ministers
Responsible for Administration & Governance of whole Country
State Govt.
Chief Minister
Council of Ministers
Responsible for Administration & Governance of State
Local Govt.
Panchayati Raj Institutions (Rural)
Municipalities (Urban)
• District Level unit
• Examine the Budget
• Organise meeting & supervise work of panchayat samiti
• Adopt measures for completion of activities
• Block level
• Executive Organ of Gram Sabha
• Prepare Plans
• Perform social welfare & Developmental of activities
• Lowest Unit
• Directly Elected Members
Zila Panchayat
Panchayat Samiti
Gram Sabha
Nagar Panchayat
Municipal Council
Municipal Corporation



Committees for Electoral Reform :

1. Tarkunde Committee (1974)
2. Dinesh Goswami Committee (1990)
3. Vohra Committee (1993)
4. Indrajit Gupta Committee (1998)
5. Election Commission of India Report on Proposed Electoral Reforms (2004)
6. Tankha Committee (2010)

Important Electoral Reforms :

- Lowering of voting age from 21 years to 18 years.
- Use of Electronic Voting Machines.
- Adjournment of poll or countermanding of elections in case of Booth capturing.
- Listing of candidates Names
  - Candidates of Recognised Parties
  - Candidates of Registered Unrecognised Parties
  - Other Independent Candidates

- Contestants restricted to Two constituencies.
- Campaigning period reduced from 20 to 14 days.
- Declaration of criminal antecedents, assets, etc., by candidates on nomination paper.
- Ceiling on Election Expenditure Increased.

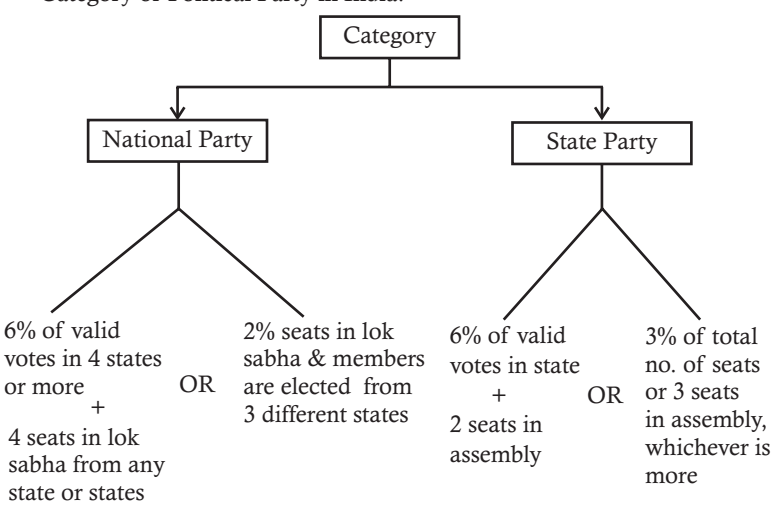
Political Parties & Pressure Group

Political Parties

- **Meaning :** Group of persons who agree on some ideology & seek to capture the power & form the government on the basis of collective leadership.
- **Type of Party System in India : Multi Party System :**
- Functions

(i) Representation
(ii) Elite Formation & Recruitment
(iii) Goal Formulation
(iv) Interest Articulation & Aggregation
(v) Socialization & Mobilization
(vi) Organization of Government.

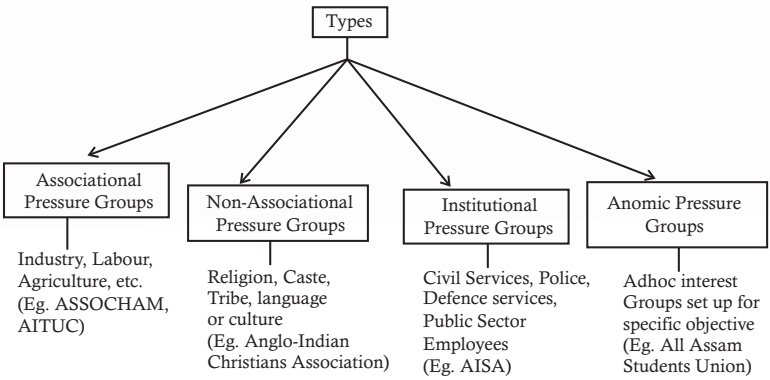
- Category of Political Party in India:-



Pressure Groups

- Represents socio-economic & political interests of a particular section in political system. Eg. farmers, industrial workers etc.
- Organised on basis of common goals & share similar values.
- Seek support of party leaders, legislators & bureaucracy in vigorous pursuit of their goals.
- Exert pressure on government in order to obtain laws and administrative measures in favour of their specific interests.
- Termed as a "Anonymous Empire"

Types of Pressure Group in India



NATIONAL POLITICAL PARTIES OF INDIA

No.	Name	Abbreviation	Symbol	Foundation Year	Current Leaders
1.	Bharatiya Janata Party	BJP	Lotus	1980	Amit Shah
2	Indian National Congress	INC	Hand	1885	Sonia Gandhi
3	Communist Party of India (Marxist)	CPI-M	Hammer, Sickle and star	1964	Sitaram Yechury
4	Communist Party of India	CPI	Ears of corn and sickle	1925	Suravaram Sudhakar Reddy
5	Bahujan Samaj Party	BSP	Elephant	1984	Mayawtai
6	Nationalist Congress Party	NCP	Clock	1999	Sharad Pawar

DIFFERENCE BETWEEN POLITICAL PARTY & PRESSURE GROUP

Political Party	Pressure Group
1. Strive to organise public opinion in issues of public concern. (Wider objectives)	Specific or sectional interets (united objectives)
2. Represents aggregation of interests. (Large membership)	Represents specific interest. (Limited Membership)
3. Generalist in organisation of opinion.	Specialist in organisation of opinion.
4. Contest Elections.	Do not contest Elections.
5. Intention of gaining political power.	No intention of gaining political power.
6. Help in formulating policies.	Tend to influence the policies of government.

FOREIGN POLICY OF INDIA

I. Principles and objectives

1. Preservation of India's sovereign independence.
2. Non-alignment.
3. Opposition to Imperialism, colonialism & Racial discrimination.
4. Opposition to discriminatory international regimes & hedonistic policies.
5. Panchsheel
- mutual respect for each other's territorial integrity &sovereignty.
- non-aggression
- Non-interference in each other's internal affairs.
- equality & mutual benefit.
- peaceful co-existence.

6. Support for United Nations & international peace.
7. Promotion of unity & solidarity of Third world for securing an equitable share in world politics.

II. Look East Policy

India's 'Lok East' Policy was first initiated in 1992 by the then Prime Minister P. V. Narasimha Rao. Since then, the policy has been one of the cornerstones of India's foreign policy. It lays emphasis on improving cooperation with India's neighbouring south-east & east. Asian countries (eg. China, Bangladesh, Myanmar, Thailand etc.) & also engagement with various regional organisations such as ASEAN, East Asia Summit, BIMSTEC & Mekong Ganga Cooperation (MGC). The policy is pursued in a multi faceted manner in diverse areas such as improved connectivity, promotion of trade, investment & cultural exchanges.

III. Gujral Doctrine

The Gujral Doctrine is a milestone in India's foreign policy. It was propounded & initiated in 1996 by I.K. Gujral, the then Foreign Minister in the Deve. Gowda Government. The Doctrine is a 5-point roadmap to guide the conduct of India's foreign relations with its neighbours.

These 5 principles are as follows

1. With the neighbours India should not ask for reciprocity, but give to them what it can is good faith.
2. No south asian country should allow its territory to be used against the interest of another country of the region.
3. No, country should interfere in the internal affairs of another country.
4. All South Asian Countries should respect each other's territorial integrity & sovereignty.
5. All South Asian countries should settle all their disputes through peaceful bilateral negotiations.

IV. Nuclear Policy of India

India adopted its Nuclear doctrine in 2003. Its main objectives are:-

1. India shall pursue a doctrine of credible minimum nuclear deterrence.
2. India will not resort to the use or threat of use of nuclear weapons against states which donot possess nuclear weapons, or are not aligned with nuclear weapon powers.
3. Deterrence requires that India maintain:-
   (a) Sufficient, survivable & operationally prepared nuclear forces.
   (b) Robust command & control system.
   (c) Effective intelligence & early warning capabilities.

India's first nuclear test - 18 May 1974.
India second nuclear test- 11 May & 13 May, 1998.

MODI'S VISIT TO NATIONS

1	**Place**	Victoria, Seychelles
	Date	10th-11thMarch
	Purpose	To strengthen maritime and bilateral ties
	Agreements	Cooperation in: • hydrography • renewable energy • infrastructure development • Sale of navigation charts and electronic navigational charts.

2	**Place**	Port Louis, Mauritius
	Date	11th -13th March
	Purpose	To build strategic asset with the island nation.
	Agreements	Cooperation in: • MoU in the field of Ocean Economy. • Programme for Cultural Cooperation for the year 2015-18. • MoU on Cooperation in the field of Traditional System of Medicine and Homeopathy.

3	**Place**	Colombo, Sri Lanka
	Date	13th -14th March
	Purpose	State Visit.
	Agreements	The two sides signed four agreements on : • visa • customs • youth development, • And building Rabindranath Tagore memorial in Sri Lanka.

4	**Place**	Paris, Toulouse, Neuve-Chapelle in France
	Date	9th-12th April
	Purpose	Strengthening International Relations.
	Agreements	• MoU between L&T and AREVA to improve the financial viability of Jaitapur project. • MoU between ISRO and CNES on Megha Tropiques, the joint project for sharing and use of data from the satellite. • Railway protocol between Indian Ministry of Railways and French National Railways (SNCF) for semi-high speed rail and station renovation.

5	**Place**	Singapore
	Date	29th March
	Purpose	State funeral of Lee Kuan Yew
	Agreements	Along with attending the state funeral of Lee Kuan Yew, Prime Minister Modi met several world leaders including the Israeli President.

6	**Place**	Berlin, Hannover in Germany
	Date	12th-14th April
	Purpose	Strengthening Bilateral relations
	Agreements	No agreement signed until German Chancellor Angela Merkel visits India in October 2015.

7	**Place**	Ottawa, Toronto and Vancouver in Canada
	Date	14th-16th April
	Purpose	Bilateral Visit
	Agreements	• Commercial agreements and announcements worth 1.6 Billion Canadian Dollars under which Saskatchewan-based Cameco will supply India with over seven million pounds of uranium over the next five years.

8	**Place**	Xi'an, Beijing, Shanghai in China
	Date	14th-16th May
	Purpose	Strengthen the Bilateral ties
	Agreements	• MoU of skill development and entrepreneurship of India and the ministry of human resources and social security of China focussing on vocational education and skill development. • MoU on consultative mechanism for cooperation in trade negotiations. • MoU on education exchange programme. • MoU of Niti Aayog and the Development Research Centre, State Council of China. • MoU between Doordarshan and China Central Television on cooperation in the field of broadcasting.

9	**Place**	Ulan Bator, Mongolia
	Date	16th-17th May
	Purpose	International Relations

	Agreements	• Agreement for avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income. • MoU for Cooperation of National Security Council Secretariat of India and the Office of National Security of Korea. • MoU between the Ministry of Youth Affairs and Sports of India and the Ministry of Gender Equality and Family of Korea on Cooperation in Youth Matters.

10	**Place**	Seoul, South Korea
	Date	18th-19th May
	Purpose	Promote Make in India
	Agreements	• Cooperation in audio-visual co-production enabling the co-production of films, animation and broadcasting programmes. • MoU with Ministry of Power and the Ministry of Trade, Industry and Energy of South Korea on cooperation in the field of electric power development and new energy industries. • MoU in the fields of maritime transport and logistics including through sharing of technologies, information and experiences.

11	**Place**	Dhaka. Bangladesh
	Date	6th-7th June
	Purpose	Expand the cordial relationship
	Agreements	• Memorandum of Understanding between Coast Guards • MoU on Prevention of Human Trafficking • MoU on Prevention of Smuggling and Circulation Fake Currency Notes • MoU between Bangladesh and India and for Extending a New Line of Credit (LoC) of US$ 2 billion by Government of India to Government of Bangladesh • MoU on Blue Economy and Maritime Cooperation in the Bay of Bengal and the Indian Ocean • MoU on Use of Chittagong and Mongla Ports • MoU for a Project under IECC (India Endowment for Climate Change) of SAARC • Agreement on Dhaka-Shillong-Guwahati Bus Service and its Protocol • Agreement on Kolkata-Dhaka-Agartala Bus Service and its Protocol.

12	**Place**	Tashkent, Uzbekistan
	Date	6th July
	Purpose	To improve Bilateral and regional issues.
	Agreements	• Cooperation in Law Enforcement to Counter-Terrorism. • Cooperation in the field of defence and cyber security. • UN Security Council Reforms to reaffirm India's candidature for permanent membership of UN Security Council.

13	**Place**	Astana, Kazakhstan
	Date	7th July
	Purpose	Boosting trade, energy, defence and security cooperation
	Agreements	• MoU by JSC Kazxnex Invest and JSC Invest India to establish bilateral trade and economic relations. • MoU on Technical Cooperation in the sphere of railways between the NC Kazakhstan Temir Zholy JSC and India's railways ministry. • MoU on defence cooperation which includes supply of 5,000 tonnes of uranium to India during 2015-19. • Transfers of sentenced persons.

14	**Place**	Ufa, Russia
	Date	8th -10th July
	Purpose	BRICS summit
	Agreements	• MoU between Quality Council of India (QCI) and Federal Accreditation Service of Russian for elimination of technical barriers in trade and economic cooperation. • MoU by Indian Council of Medical Research (ICMR) and the Russian Foundation for Basic Research (RFBR) for cooperation in various areas of health research. • MoU between TATA Power and Russian Direct Investment Fund (RDIF) exploring opportunities in the energy sector. • MoU between ACRON of Russia and NMDC of Indiato acquire stake in a potash mine in Russia. • MoU between ESSAR and ROSNEFT to ensure ten year supply and purchasecrude oil and feed stocks/productsby India.

		• Agreement for Training of Indian Armed Forces Personnel in the Military Educational Establishments of the Defence Ministry of the Russian Federation establishing understanding between the two forces.

15	**Place**	Ashgabat, Turkmenistan
	Date	10th-11th July
	Purpose	To enhance cooperation among the two nations.
	Agreements	• MoU on Supply of Chemical Products between the Indian Public Sector Undertaking 'Rashtriya Chemicals and Fertilizers Limited' and the Turkmen State concern 'Turkmenhimiya' • MoU between the Foreign Service Institute of the Ministry of External Affairs of India and the Institute of International Relations of the Ministry of Foreign Affairs of Turkmenistan. • MoU between India and Turkmenistan on Cooperation in Yoga and Traditional Medicine.

16	**Place**	Bishkek,Kyrgyzstan
	Date	12th July
	Purpose	To counter threat of terrorism and extremism
	Agreements	• Agreement on Defence Cooperation in relation to matters of defence, security, military education and training. • MoU and Cooperation in the field of Electionsrelating to legislation on elections and referendums. • Agreement on cooperation in culture ensuringpreservation of cultural heritage, organisation of folk arts, theatre.

17	**Place**	Dushanbe, Tajikistan
	Date	12th-13th July
	Purpose	Bilateral ties
	Agreements	• Programme of Cooperation (POC) between Ministries of Culture of India and Tajikistan in the field of Culture for the years 2016-18 for greater cultural understanding between the countries. • Exchange of Note Verbale (NV) on setting up of Computer Labs in 37 Schools in Tajikistanto set up computer labs in 37 schools in Tajikistan for supporting Tajikistan's human resource and skill development efforts.

18		
	Place	Abu Dhabi, Dubai
	Date	16th -17th August
	Purpose	To counter threat of terrorism and enhance trade
	Highlights	• UAE's 'landmark' decision to allocate land for a temple. • UAE to invest 4.5 lakh crore rupees in India. • UAE - India to boost trade and establish a security dialogue.

19		
	Place	Dublin, Ireland
	Date	23rd September
	Purpose	To enhance trade and commerce and aviation.
	Highlights	• Promotion of business links and cooperation to boost tourism ties, which are already growing at a yearly rate of 14 per cent. • Economic partnership in the fields of information technology, biotechnology and pharmaceuticals, agricultural and clean energy. • Ireland to provide support for India's membership into the Nuclear Suppliers Group and permanent seat in the UNSC. • Exchange of views on important international issues like, terrorism, radicalism and the challenges emerging out of it in Europe and Asia.

20		
	Place	New York, San Francisco in USA
	Date	24th-30thSeptember
	Purpose	United Nations General Assembly
	Highlights	• PM Narendra Modi addressed the Indian diaspora at the SAP Center in Silicon Valley. • Google CEO Sundar Pichai announced a proposal for introduction of broadband connectivity, through Wi-Fi hotspots, at 100 railway stations. • Qualcomm Incorporated announced establishment of $150 million India-specific Venture Fund formed to foster promising Indian start-ups. • Modi launched Bharat Fund at India-U.S. StartUp Konnect programme. It is aimed at providing seed funding to Indian entrepreneurs. • Modi answered questions from the audience at a Townhall at the Facebook headquarters at Menlo Park, California.

21		
	Place	London, Chequers in United Kingdom
	Date	12th-14th November
	Purpose	To enhance and deepen economic engagement.
	Highlights	• India and the UK have announced commercial deals worth 9 billion pounds in London. • OPG Power Ventures plc will further invest in India by £2.9 billion to a total of £3.4 billion, creating around 100 UK jobs over next few years. • Merlin Entertainments to open a Madame Tussauds wax attraction in New Delhi in 2017. • Genus ABS to invest £1 million in India, creating latest dairy genetics and constructing a state-of-the-art facility near Pune. • Solar PV generator in the UK and Europe, Lightsource, has announced a £2 billion investment in India. • Vodafone has announced a range of further investments in India totalling £1.3 billion (₹ 13,000 crore) to support the Government of India's 'Digital India' and 'Make in India' campaigns. • Holland & Barrett International has partnered with Apollo Hospitals in a deal worth £20 million. • Bharti Airtel intends issuing its maiden sterling bond of up to £500 million to be listed on the London Stock Exchange. • Wipro has increased its investment in the UK with the opening of its newest office for Wipro Digital. • MoU signed between the two countries on tech cooperation in the rail sector.

22		
	Place	Antalya, Turkey
	Date	15th–16th November
	Purpose	G-20 Summit
	Highlights	• PM Modi met the leaders of Australia and Spain, and also the Saudi Arabia's King Salman Al-Saud on the sidelines of the G20 Summit. • India and Turkey to team up for infrastructure projects and tackling the problem of terrorism. • Modi urged the G20 nations to fulfil the global aspirations for clean energy. • India promised to increase renewable power capacity four-folds to 175 gigawatt by 2022 and cut fossil subsidies. • Nuclear-deal procedure for supplying uranium has been sealed between India and Australia.

23		
	Place	Kuala Lumpur, Malaysia
	Date	21-22 November
	Purpose	ASEAN-India summit and East Asia Summit
	Highlights	• MoU was signed on Performance Management Delivery Unit (PEMANDU) to ensure excellent cooperation in Public Administration and Governance. • PM urged Malaysian government for co-operation and enhanced participation in projects like 'Make in India' and 'Smart city' initiatives. • PM Modi also announced the inauguration of Torana Gate at the entrance of Little India in Bricksfield, Kuala Lumpur. • India and Malaysia to deepen their cooperation on security challenges and terrorism.

24		
	Place	Singapore
	Date	23rd-25th November
	Purpose	To elevate bilateral relations of both countries.
	Highlights	• MoUs on curtailing drug trafficking and improving cyber security. • Collaboration in urban planning and wastewater management. • MoU for cooperation in civil aviation services and airport management beginning with Jaipur and Ahmedabad airports. • Extending of long-term loan of Indian artefacts to the Asian Civilisations Museum of Singapore.

25		
	Place	France
	Date	30th November – 1st December
	Purpose	2015 United Nations Climate Change Conference COP21
	Highlights	• PM Modi inaugurated India Pavilion showcasing India's harmony with nature, environment and commitment to mitigate climate change. • PM Modi and French President Francois Hollande jointly unveiled the International Solar Alliance. • PM Modi also attended 'Mission Innovation' hosted by President of the United States.

26		
	Place	Russia
	Date	23rd December – 24th December

27		
	Place	Afghanistan
	Date	25th December

28		
	Place	Pakistan
	Date	25th December

World Polity

Cold War Era

Contemporary world politics is the direct outcome of World War II. In 1945, the Allied Forces, led by the US, Soviet Union, Britain and France defeated the Axis Powers led by Germany, Italy and Japan, ending the Second World War (1939- 1945). The war had involved almost all the major powers of the world and spread out to regions outside Europe including Southeast Asia, China, Myanmar and parts of India's northeast.

The First World War had earlier shaken the world between 1914 and 1918. The end of the Second World War was also the beginning of the Cold War. The world war ended when the United States dropped two atomic bombs on the Japanese cities of Hiroshima and Nagasaki in August 1945, causing Japan to surrender. With the defeat of Germany and Japan, the devastation of Europe and in many other parts of the world, the United States and the Soviet Union became the greatest powers in the world with the ability to influence events anywhere on earth. The Cold War — in spite of being an intense form of rivalry between great powers — remained a 'cold' and not hot or shooting war. The dominance of two superpowers, the United States of America and the Soviet Union, was central to the Cold War. As a result Non Aligned Movement (NAM) as a challenge to the dominance of the two superpowers was born.



Cuban Missile Crisis

The Cuban Missile Crisis is a time when the United States and the Soviet Union almost had a nuclear war. When the U.S. discovered offensive nuclear missiles in Cuba, it started a tense period of 13 days while the world watched to see if the Soviets would remove the missiles, just 90 miles from the U.S.

President Kennedy did not dare to invade Cuba, because that action could have started a world war - yet he could not let the missile sites be completed. With his advisers, he decided on a naval blockade to prevent Russian ships delivering the missiles for the Cuban sites.

Khrushchev warned that Russia would see the blockade as an act of war. Russian forces were put on alert; US bombers were put in the air carrying nuclear bombs; preparations were made to invade Cuba. There was massive tension in both Washington and Moscow. Everybody thought the world was going to come to an end. Secretly, the Americans suggested a trade-off of missile bases - US bases in Turkey for Russian bases in Cuba.

The Russians made the first public move. The ships heading for Cuba turned back, and Khrushchev sent a telegram offering to dismantle the Cuban bases if Kennedy lifted the blockade and promised not to invade Cuba. Then, as though having second thoughts, he sent a second letter demanding the dismantling of the Turkish bases. At the vital moment, a US U2 spy plane was shot down. However, Kennedy ignored the U2 attack and agreed publicly to the first letter, and secretly to the second. The crisis was over.

The Emergence of Two Power Blocs

The two superpowers were keen on expanding their spheres of influence in different parts of the world. In a world sharply divided between the two alliance systems, a state was supposed to remain tied to its protective superpower to limit the influence of the other superpower and its allies. The smaller states in the alliances used the link to the superpowers for their own purposes. They got the promise of protection, weapons, and economic aid against their local rivals, mostly regional neighbours with whom they had rivalries. The alliance systems led by the two superpowers, therefore, threatened to divide the entire world into two camps. This division happened first in Europe. Most countries of western Europe sided with the US and those of eastern Europe joined the Soviet camp. That is why these were also called the 'western' and the 'eastern' alliances.

The western alliance was formalised into an organisation, the North Atlantic Treaty Organisation (NATO), which came into existence in April 1949. It was an association of twelve states which declared that armed attack on any one of them in Europe or North America would be regarded as an attack on all of them. It was created in 1955 and its principal function was to counter NATO's forces in Europe. In East and Southeast Asia and in West Asia (Middle East), the United States built an alliance system called — the Southeast Asian Treaty Organisation (SEATO) and the Central Treaty Organisation (CENTO). The Soviet Union and communist China responded by having close relations with regional countries such as North Vietnam, North Korea and Iraq. The Cold War threatened to divide the world into two alliances. Communist China quarrelled with the USSR towards the late 1950s, and, in 1969, they fought a brief war over a territorial dispute. The other important development was the Non-Aligned Movement (NAM), which gave the newly independent countries a way of staying out of the alliances.

The Cold War did not eliminate rivalries between the two alliances, mutual suspicions led them to arm themselves to the teeth and to constantly prepare for war. Huge stocks of arms were considered necessary to prevent wars from taking place. In time, therefore, the US and USSR decided to collaborate in limiting or eliminating certain kinds of nuclear and non-nuclear weapons. A stable balance of weapons, they decided, could be maintained through 'arms control'. Starting in the 1960s, the two sides signed three significant agreements within a decade. These were the Limited Test Ban Treaty, Nuclear Nonproliferation Treaty and the Anti-Ballistic Missile Treaty. Thereafter, the superpowers held several rounds of arms limitation talks and signed several more treaties to limit their arms.

India and the Cold War

As a leader of NAM, India's response to the ongoing Cold War was two-fold: At one level, it took particular care in staying away from the two alliances. Second, it raised its voice against the newly decolonised countries becoming part of these alliances. India's policy was neither negative nor passive. During the Cold War, India repeatedly tried to activate those regional and international organisations, which were not a part of the alliances led by the US and USSR.

Arms Control Treaties

Limited Test Ban Treaty (LTBT): Banned nuclear weapon tests in the atmosphere, in outer space and under water. Signed by the US, UK and USSR in Moscow on 5 August 1963. Entered into force on 10 October 1963.

Nuclear Non-Proliferation Treaty (NPT): Allows only the nuclear weapon states to have nuclear weapons and stops others from aquiring them. For the purposes of the NPT, a nuclear weapon state is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967. So there are five nuclear weapon states: US, USSR (later Russia), Britain, France and China. Signed in Washington, London, and Moscow on 1 July 1968. Entered into force on 5 March 1970. Extended indefinitely in 1995.

Strategic Arms Limitation TalksI (SALT-I): The first round of the Strategic Arms Limitation Talks began in November 1969. The Soviet leader Leonid Brezhnev and the US President Richard Nixon signed the following in Moscow on 26 May 1972 – a) Treaty on the limitation of Anti-Ballistic Missile Systems (ABM Treaty); and b) Interim Agreement on the limitation of strategic offensive arms. Entered into force on 3 October 1972.

Strategic Arms Limitation Talks II (SALT-II): The second round started in November 1972. The US President Jimmy Carter and the Soviet leader Leonid Brezhnev signed the Treaty on the limitation of strategic offensive arms in Vienna on 18 June 1979.

Strategic Arms Reduction TreatyI (START-I): Treaty signed by the USSR President Mikhail Gorbachev and the US President George Bush (Senior) on the reduction and limitation of strategic offensive arms in Moscow on 31 July 1991.

Strategic Arms Reduction Treaty II (START-II): Treaty signed by the Russian President Boris Yeltsin and the US President George Bush (Senior) on the reduction and limitation of strategic offensive arms in Moscow on 3 January 1993.

UNITED NATIONS

The United Nations is an international organization founded in 1945 after the Second World War by 51 countries committed to maintaining international peace and security, developing friendly relations among nations and promoting social progress, better living standards and human rights.

Quick Facts

- Membership: 193 Member States
- Established: 24 October 1945
- Current UN peacekeeping operations : 16
- Official languages: Arabic, Chinese, English, French, Russian, Spanish.

- The first day approved by the UN General Assembly was United Nations Day, 24 October (by resolution 168 (II) of 31 October 1947).
- Based on five principal organs (formerly six–the Trusteeship Council suspended operations in 1994, upon the independence of Palau, the last remaining UN trustee territory); the General Assembly, the Security Council, the Economic and Social Council (ECOSOC), the Secretariat, and the International Court of Justice.
- General Assembly: 193 Member States
- Security Council: 5 permanent members and 10 non-permanent

The Permanent Members of the Security Council

- The Peoples' Republic of China;
- The Republic of France;
- The United Kingdom of Great Britain and Northern Ireland;
- The Russian Federation; and
- The United States of America.

Official Language of United Nations :

There are six official languages of the United Nations, used in intergovernmental meetings and documents. They are Arabic, Chinese, English, French, Russian and Spanish.

The UN Flag and the Emblem

The UN General Assembly adopted the UN flag on 20 Oct. 1947. The white UN emblem is super-imposed on a light blue back ground. The emblem consists of the globe map projected from the North pole and embraced in twin olive branches (symbol of peace). The UN emblem was approved on 7 Oct. 1946.

Aims and Objectives

The Main objectives of the UN are :

(1) To maintain peace and security in the world.
(2) To work together to remove poverty, disease and illiteracy and encourage respect for each other's rights of basic freedom.
(3) To develop friendly relations among nations.
(4) To be a centre to help nations achieve these common goals.

The six main organs of the United Nations System are :

General Assembly

The General Assembly is the main deliberative assembly of the United Nations. Composed of all United. Nations member states, the assembly meets in regular yearly sessions under a president elected from among the member states.

Security Council

The Security Council is charged with maintaining peace and security among countries. While other organs of the United Nations can only make 'recommendations' to member governments, the Security Council has the power to make binding decisions that member governments have agreed to carry out, under the terms of Charter Article 25. The decisions of the Council are known as United Nations Security Council resolutions.

The Security Council is made up of 15 member states, consisting of 5 permanent members–China, France, Russia, UK, USA and 10 non-permanent members.

Secretariat

The United Nations Secretariat is headed by the Secretary-General, assisted by a staff of international

civil servants worldwide. It provides studies, information, and facilities needed by United Nations bodies for their meetings. It also carries out tasks as directed by the UN Security Council, the UN General Assembly, the UN Economic and Social Council, and other UN bodies.

The Secretariat is headed by the Secretary-General, who acts as the spokesperson and leader of the UN. The current Secretary-General is Ban Ki-moon, who took over from Kofi Annan in 2007 and will be eligible for reappointment when his first term expires in 2011.

International Court of Justice

The International Court of Justice (ICJ), located in The Hague, Netherlands, is the primary judicial organ of the United Nations. Established in 1945 by the United Nations Charter, the Court began work in 1946 as the successor to the Permanent Court of International Justice.

Economic and Social Council

Economic and Social Council (ECOSOC) assists the General Assembly in promoting international economic and social cooperation and development. ECOSOC has 54 members, all of which are elected by the General Assembly for a three-year term.

Trusteeship Council

It is one of the principal organs of United Nations which armed at ensuring the fact that the trust territories were administered in the best interest of their in habitant and of international peace and security. It was formed in 1945 council the mission of the was fulfilled, it collapsed on 1 November 1994.

Secretaries-General of the United Nations

No.	Name	Country of origin	Took office	Left office
1	Trygve Lie	Norway	2-Feb-46	10-Nov-52
2	Dag Hammarskjold	Sweden	10-Apr-53	18-Sep-61
3	U Thant	Burma	30-Nov-61	1-Jan-72
4	Kurt Waldheim	Austria	1-Jan-72	1-Jan-82
5	Javier Pérez de Cuéllar	Peru	1-Jan-82	1-Jan-92
6	Boutros Boutros-Ghali	Egypt	1-Jan-92	1-Jan-97
7	Kofi Annan	Ghana	1-Jan-97	1-Jan-07
8	Ban Ki-moon	South Korea	1-Jan-07	Incumbent

SPECIALIZED AGENCIES OF THE UNITED NATIONS

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Headquarters : Place de Fontenoy, Paris, France
Established : 16 November 1945
Head : Irina Bokova,
Members : 195 member states and 9 associate members

Functions:

- Mobilizing for education by providing every child, irrespective of its gender quality education as a fundamental human right

- Creation of World Heritage Sites to support cultural diversity and protect sites of outstanding universal value.
- Pursuing scientific cooperation
- Protecting freedom of expression

The United Nations Children's Fund (UNICEF)

Headquarters : New York City
Established : 11 December 1946
Head : Anthony Lake
Members : 36 Member States

Functions :

- Child protection from violence, exploitation and abuse along with social inclusion for disabled.
- Basic education and gender equality through programmes like girls education innovation for education learning for the peace out-of-school initiative.
- Policy advocacies and partnership through data analysis, leveraging resources and child participation.

International Labour Organization (ILO)

Headquarters : Geneva, Switzerland
Established : 1919 Head: Guy Ryder
Members : 185 of the 193 member states of the United Nations plus the Cook Islands are members of the ILO

Functions :

- Creation of international labour standards
- Formulation of international policies,
- Technical assistance training,
- Education, research and publishing activities

World Bank (WB)

Headquarters : Washington, DC, USA
Established : July 1944
Head : Jim Yong Kim
Members : 188 states (187 UN countries and Kosovo)

Functions :

- World Bank provides various technical services to the member countries.
- Bank can grant loans to a member country up to 20% of its share in the paid-up capital.
- Quantities of loans, interest rate and terms and conditions are determined by the Bank itself.
- Bank grants loans for a particular project duly submitted to the Bank by the member country.

The International Monetary Fund (IMF)

Headquarters : Washington, D.C.
Established : 27 December 1945
Head : Christine Lagarde
Members : 188 countries

Functions :

- Surveillance over Members' Economic Policies
- Financing Temporary Balance of Payments Needs
- Combating Poverty in Low-Income Countries
- Mobilizing External Financing

The World Health Organization (WHO)

Headquarters : Geneva, Switzerland
Established : 7 April 1948
Head : Margaret Chan, Director General
Members : 194 member states

Functions :

- Providing leadership on matters critical to health and engaging in partnerships where joint action is needed;
- Shaping the research agenda and stimulating the generation, dissemination of valuable knowledge

- Providing technical support, catalyzing change, and building sustainable institutional capacity;
- Monitoring the health situation and assessing health trends.

International Fund for Agricultural Development Objective (IFAD)

Headquarters : Rome, Italy
Established : 1977
Head : Kanayo F. Nwanze
Members : 176 member statesv (174 UN members states along with the Cook Islands and Niue)

Functions :
To ensure that poor rural mass have access to:

- Natural resources, especially secure access to land and water
- Improved agricultural technologies and effective production services.
- A broad range of financial services

The Food and Agriculture Organization of the United Nations (FAO)

Headquarters : Palazzo, Rome, Italy
Established : 16 October 1945, in Quebec City, Canada
Head : José Graziano da Silva
Members : 197 members

Functions:

- Help eliminate hunger, food insecurity and malnutrition.
- Make agriculture, forestry and fisheries more productive and sustainable.
- Reduce rural poverty

International Atomic Energy Agency (IAEA)

Headquarters : Vienna, Austria
Established : July 29, 1957
Head : José Yukiya Amano
Members : 166 member states

Functions :

- Peaceful uses: Promoting the peaceful uses of nuclear energy by its member states.
- Safeguards: Implementing safeguards to verify that nuclear energy is not used for military purposes.
- Nuclear safety: Promoting high standards for nuclear safety.

United Nations Industrial Development Organization (UNIDO)

Headquarters : Vienna, Austria
Established : 1966(converted to a specialized agency in 1985)
Head : Li Yong
Members : 172 States

Functions :

- Assists developing countries in the formulation of development, institutional, scientific and technological policies and programmes in the field of industrial development;
- Analyzes trends, disseminates information and coordinates activities in their industrial development;
- Acts as a forum for consultations and negotiations directed towards the industrialization of developing countries;

The United Nations World Tourism Organization (UNWTO)

Headquarters : Madrid, Spain
Established : 1957
Head : Taleb Rifai
Members : 157 states

Functions :

To promote and develop sustainable tourism so as to contribute to economic development, international understanding, peace, prosperity etc.

The World Food Programme (WFP)

Headquarters : Rome, Italy
Established : 1961
Head : Ertharin Cousin
Members : 36 member states.

Functions :

- Save lives and protect livelihoods in emergencies.
- Support food security and nutrition and (re) build livelihoods in fragile settings
- Reduce risk and enable people, communities and countries to meet their own food and nutrition needs.

The World Intellectual Property Organization (WIPO)

Headquarters : Geneva, Switzerland
Established : July 14, 1967
Head : Francis Gurry (Director-General)
Members : 188 member states

Functions :

- Promoting creative intellectual activity and for facilitating the transfer of technology related to industrial property to the developing countries

World Meteorological Organization (WMO)

Headquarters :Geneva, Switzerland
Established : 1950 HeadMichel Jarraud (Secretary-General)
Members : 191 Member States and Territories

Functions :

- Provides a frame work for international cooperation in the development of meteorology and operational hydrology and their practical application.
- played a unique and powerful role in contributing to the safety and welfare of humanity
- Under WMO, National Meteorological and Hydrological Services contribute substantially to the protection of life and property against natural disasters

The United Nations Development Programme (UNDP)

Headquarters : New York City
Established : 1965
Head : Helen Clark
Members : 177 countries

Functions :

- Poverty reduction
- Crisis prevention and recovery
- Environment and Energy

The United Nations High Commissioner for Refugees (UNHCR)

Headquarters : Geneva, Switzerland
Established : 14 December 1950
Head : António Guterres
Members : 98 members

Functions :

- To lead and co-ordinate international action to protect refugees and resolve refugee problems worldwide.
- To protect and providing humanitarian assistance to whom it describes as other persons "of concern," including internally displaced persons

The United Nations Environment Programme (UNEP)

Headquarters : Nairobi, Kenya
Established : 5 June 1972
Head : Achim Steiner
Members : 54 countries on the African Continent

Functions :

- Assessing global, regional and national environmental conditions and trends
- Developing international and national environmental instruments
- Strengthening institutions for the wise management of the environment

The United Nations Population Fund (UNFPA)

Headquarters : New York City
Established : 1969
Head : Dr. Babatunde Osotimehin
Members : 36 countries

Functions :

- Universal access to reproductive health services by 2015
- Universal primary education and closing the gender gap in education by 2015
- Reducing maternal mortality by 75 per cent by 2015
- Reducing infant mortality

United Nations Conference on Trade and Developmental

Headquarters : Geneva, Switzerland
Established : 1964
Head : Dr. Babatunde Osotimehin
Members : 194 member states

Functions :

- To formulate policies relating to all aspects of development including trade, aid, transport, finance and technology.

UN INTERNATIONAL YEARS

Since 1959 the UN has designated International years in order to draw attention to major issues and to encourage international action to address concerns which have global importance and ramifications.

2000	International Year for the Culture of Peace; and International Year of Thanksgiving
2001	International Year of Volunteers; and United Nations Year of Dialogue among Civilizations; and International Year of Mobilization against Racism, Racial Discrimination, Xenophobia and Related Intolerance
2002	International Year of Mountains; and International Year of Culture Heritage; and International Year of Ecotourism
2003	International Year of Freshwater
2004	International Year to Commemorate the Struggle against Slavery and Its Abolition; and International Year of Rice
2005	International Year of Microcredit; and International Year for Sport and Physical Education
2006	International Year of Deserts and Desertification
2008	International Year of the Potato; and International Year of Planet Earth; and International Year of Sanitation; and International Year of Languages

2009	International Year of Human Rights Learning - from 10 December 2008 (Human Rights Day) to 10 December 2009 International Year of Reconciliation; and International Year of Natural Fibres; and International Year of Astronomy
2010	International Year of Biodiversity; and International Year for the Rapprochement of Cultures International Year of Youth: Dialogue and Mutual Understanding - from 12 August 2010 (International Youth Day) to 11 August 2011
2011	International Year of Forests; and International Year of Chemistry; and International Year for People of African Descent
2012	International Year of Cooperatives
2013	International Year of Water Cooperation.
2014	International Year of Family Farming International Year of Crystallagraphy

International decades

2011–2020	Third International Decade for the Eradication of Colonialism. United Nations Decade on Biodiversity. Decade of Action for Road Safety.
2010–2020	United Nations Decade for Deserts and the Fight against Desertification.
2008–2017	Second United Nations Decade for the Eradication of Poverty.
2006–2016	Decade of Recovery and Sustainable Development of the Affected Regions (third decade after the Chernobyl disaster).
2005–2015	International Decade for Action, "Water for Life".
2005–2014	United Nations Decade of Education for Sustainable Development. Second International Decade of the World's Indigenous People.
2003–2012	United Nations Literacy Decade: Education for All.
2001–2010	International Decade for a Culture of Peace and Non-violence for the Children of the World. Decade to Roll Back Malaria in Developing Countries, Particularly in Africa. Second International Decade for the Eradication of Colonialism.

International U.N. Week

- March 21–27 Week of Solidarity with the Peoples Struggling against Racism and Racial Discrimination, recognized by the UN.
- April 25 – May 2 (2009) — Vaccination Week In The Americas.
- May 25–31 Week of Solidarity with the Peoples of Non-Self-Governing Territories, recognized by the UN.
- 4th week of September - (International) Peace Week.
- October 4–10 - World Space Week, recognized by the UN.
- October 24–30 - Disarmament Week, recognized by the UN.
- October 25–31 - International Epidermolysis Bullosa Awareness Week.
- Road Safety Week - November
- Shark Week - Summer

UN WOMEN

The United Nations agreed to the formation of a new institution named "UN Women" on 2nd July 2010. The main objective will be the sexual/gender equality and women empowerment.

The fifty-ninth session of the Commission on the Status of Women took place at United Nations Headquarters in New York from 9 to 20 March 2015. Representatives of Member States , UN entities, and ECOSOC-accredited non-governmental organizations (NGOs) from all regions of the world attended the session. The main focus of the session was on the Beijing Declaration and Platform for Action, including current challenges that affect its implementation and the achievement of gender equality and the empowerment of women.

The sixtieth session of the Commission on the Status of Women will take place at the United Nations Headquarters in New York from 14 to 24 March 2016.

World Trade Organization (WTO)

The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. The goal is to help producers of goods and services, exporters, and importers conduct their business.

Facts :

Location : Geneva, Switzerland
Established : 1 January 1995
Created by : Uruguay Round negotiations (1986-94)
Membership : 161 members
Head : Roberto Azevedo
Functions :

- Administering WTO trade agreements
- Forum for trade negotiations
- Handling trade disputes
- Monitoring national trade policies
- Technical assistance and training for developing countries
- Cooperation with other international organizations

Event: Tenth WTO Ministerial Conference (15th to 19th Dec, 2015)
Place : Nairotri, Kenya

Agenda: Decision on agriculture, cotton and issues related to least developed countries.

OTHER AGENCIES

Non-Aligned Movement (NAM)

The Non-Aligned Movement (NAM) is an intergovernmental organization of states considering themselves not aligned formally with or against any major power bloc. As of now, the organization has 120 members and 17 observer countries. Generally speaking the Non-Aligned Movement members can be described as all of those countries which belong to the Group of 77 (along with Belarus and Uzbekistan), but which are not observers in Non-Aligned Movement and are not Oceanian (with the exception of Papua New Guinea and Vanuatu).

The organization was founded in Belgrade in 1961, and was largely the brainchild of Yugoslavia's first President, Josip Broz Tito, India's first Prime Minister, Jawaharlal Nehru, Egypt's second President, Gamal Abdel Nasser, and Indonesia's first President, Sukarno. All four leaders were prominent advocates of a middle course for states in the Developing

World between the Western and Eastern blocs in the Cold War.

The purpose of the organisation as stated in the Havana Declaration of 1979 is to ensure "the national independence, sovereignty, territorial integrity and security of non-aligned countries" in their "struggle against imperialism, colonialism, neo-colonialism, racism, and all forms of foreign aggression, occupation, domination, interference or hegemony as well as against great power and bloc politics." They represent nearly two-thirds of the United Nations's members and 55% of the world population, particularly countries considered to be developing or part of the third world.

Event: Working group meeting (14-July, 2015)

Place: Egypt Agenda total elimination of nuclear weapons.

THE COMMONWEALTH

The Commonwealth of Nations, normally referred to as the Commonwealth and previously known as the British Commonwealth, is an intergovernmental organisation of fifty-four independent member states. All except two (Mozambique and Rwanda) of these countries were formerly part of the British Empire.

The member states co-operate within a framework of common values and goals. These include the promotion of democracy, human rights, good governance, the rule of law, individual liberty, egalitarianism, free trade, multilateralism and world peace. The Commonwealth is not a political union, but an intergovernmental organisation through which countries with diverse social, political and economic backgrounds.

The symbol of their free association is the Head of the Commonwealth, which is a ceremonial position currently held by Queen Elizabeth II.

Member countries span six continents and oceans from Africa (19), Asia (8), the Americas (2), the Caribbean (12), Europe (3) and the South Pacific (10).

The Commonwealth Heads of Government Meeting, abbreviated to **CHOGM**, is a biennial summit meeting of the heads of government from all Commonwealth nations. Every two years the meeting is held in a different member state, and is chaired by that nation's respective Prime Minister or President, who becomes the Commonwealth Chairperson-in-Office.

Event: Young Professional Programme (2015)

Place: London

Agenda: Recruit young professionals in the division such as Economic Policy, Rule of Law, Human Resources and Youth.

European Union

The European Union (EU) is an economic and political union of 28 member states which are located primarily in Europe.

The Maastricht Treaty established the European Union under its current name in 1993. The last amendment to the constitutional basis of the EU, the Treaty of Lisbon, came into force in 2009.

Event: European Council, (17-18 December 2015)

Place: Brussels

Agenda: Focused on migration, fight against terrorism, the five presedent's report on the Economic and Monetary Union the completion of the single market and the UK plans for the referendum.

SAARC

The South Asian Association for Regional Cooperation (SAARC) is an

organization of South Asian nations, founded in 1985. Its seven founding members are Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Afghanistan joined the organization in 2007. Meetings of heads of state are usually scheduled annually; meetings of foreign secretaries, twice annually. Headquarters are in Kathmandu, Nepal.

- The concept of SAARC was first adopted by Bangladesh during 1977, under the administration of President Ziaur Rahman.
- Afghanistan was added to the regional grouping on 13 November 2005.
- On 2 August 2006 the foreign ministers of the SAARC countries agreed in principle to grant observer status to the US, South Korea and the European Union.
- The SAARC Secretariat was established in Kathmandu on 16 January 1986 and was inaugurated by Late King Birendra Bir Bikram Shah of Nepal.
- The SAARC Secretariat and Member States observe 8 December as the SAARC Charter Day .

SAARC SUMMITS

No.	Location	Date
1st	Dhaka	7-8 December 1985
2nd	Bangalore	16-17 November 1986
3rd	Kathmandu	2-4 November 1987
4th	Islamabad	29-31 December 1988
5th	Malé	21-23 November 1990
6th	Colombo	21-Dec-91
7th	Dhaka	10-11 April 1993
8th	New Delhi	2-4 May 1995
9th	Malé	12-14 May 1997
10th	Colombo	29-31 July 1998
11th	Kathmandu	4-6 January 2002
12th	Islamabad	2-6 January 2004
13th	Dhaka	12-13 November 2005
14th	New Delhi	3-4 April 2007
15th	Colombo	1-3 August 2008
16th	Thimphu	28-29 April 2010
17th	Maldives	November 2011
18th	Nepal	2014
19th	Pakistan	2016

DESIGNATED SAARC YEARS

1989	SAARC Year of Combating Drug Abuse and Drug Trafficking
1990	SAARC Year of Girl Child
1991	SAARC Year of Shelter
1992	SAARC Year of Environment
1993	SAARC Year of Disabled Persons
1994	SAARC Year of the Youth
1995	SAARC Year of Poverty Eradication
1996	SAARC Year of Literacy
1997	SAARC Year of Participatory Governance
1999	SAARC Year of Biodiversity
2002-2003	SAARC Year of Contribution of Youth to Environment
2004	SAARC Awareness Year for TB and HIV/AIDS
2005	South Asia Tourism Year
2006	South Asia Tourism Year
2007	Green South Asia Year

NATO

The North Atlantic Treaty Organization or NATO also called the (North) Atlantic Alliance, is an intergovernmental military alliance based on the North Atlantic Treaty which was signed on 4 April 1949. The NATO headquarters are in Brussels, Belgium, and the organization constitutes a system of collective defence whereby its member states agree to mutual defense in response to an attack by any external party.

On 1 April 2009, membership was enlarged to 28 with the entrance of Albania and Croatia.

Meetings of NATO Ministers of Foreign Affairs

Place: Brussels

Agenda: Open door policy

SEATO

The Southeast Asia Treaty Organization (SEATO) was an international organization for collective defense which was signed on September 8, 1954 in Manila. The formal institution of SEATO was established at a meeting of treaty partners in Bangkok in February 1955. It was primarily created to block further communist gains in Southeast Asia. The organization's headquarters were located in Bangkok, Thailand. SEATO was dissolved on June 30, 1977.

SEATO was planned to be a Southeast Asian version of the North Atlantic Treaty Organization (NATO), in which the military forces of each member would be coordinated to provide for the collective defense of the members' country.

INTERPOL

Interpol (the International Criminal Police Organization) is largest organization facilitating international police cooperation. It was established as the International Criminal Police Commission in 1923 and adopted its telegraphic address as its common name in 1956.

Its membership of 190 countries provides finance of around $78 million through annual contributions. The organization's headquarters is in Lyon, France.

Its current Secretary-General is Jiirgen Stock. Mireilli Ballestrazzi is the current president.

Events: Conference on strengthening law enforcement capacity in the Americas (14-15 December, 2015)

Place: Trenidad and Tabago.

Agenda: Discuss strategic and operational policing issues affecting the Americas region and to identify the ways to strengthen collaborating partnerships.

GROUP OF 8

The Group of Eight is a forum, created by France in 1975, for governments of six countries in the world: France, Germany, Italy, Japan, the United Kingdom, and the United States. In 1976, Canada joined the group (thus creating the G7). In 1997, the group added Russia thus becoming the G8. In addition, the European Union is represented within the G8, but cannot host or chair. "G8" can refer to the member states or to the annual summit meeting of the G8 heads of government.

Event: G8 Elmau Summit (7-8 June, 2015)

Place: Germany

Agenda: Biodiversity: A vital foundation for sustainable development.

Group of 77

The Group of 77 (G-77) was established on 15 June 1964 by seventy-seven developing countries signatories of the "Joint Declaration of the Seventy-Seven Countries" issued at the end of the first session of the United Nations Conference on Trade and Development (UNCTAD) in Geneva. Beginning with the first "Ministerial Meeting of the Group of 77 in Algiers (Algeria) on 10 - 25 October 1967, which adopted the Charter of Algiers", a permanent institutional structure gradually developed which led to the creation of Chapters of the Group of 77 with Liaison offices in Geneva (UNCTAD), Nairobi (UNEP), Paris (UNESCO), Rome (FAO/IFAD), Vienna (UNIDO), and the Group of 24 (G-24) in Washington, D.C. (IMF and World Bank). Although the members of the G-77 have increased to the original name was retained because of its historic significance.

GROUP OF 15

The Group of Fifteen (G-15) was established at a Summit Level Group of Developing Countries in September 1989, following the conclusion of the Ninth Non-Aligned Summit Meeting in Belgrade. The Group was originally founded by 15 developing countries. While there are now 17 member countries, the original name of the Group has been retained.

This forum was set up to foster cooperation and provide input for other international groups, such as the World Trade Organization and the Group of Eight. It is composed of countries from North America, South America, Africa, and Asia with a common goal of enhanced growth and prosperity. The G-15 focuses on cooperation among developing countries in the areas of investment, trade, and technology.

Group of 20

The Group of Twenty Finance Ministers and Central Bank Governors from 20 economies: 19 countries plus the European Union, which is represented by the President of the European Council and by the European Central Bank. Their heads of government or state have also periodically meet at summits since their initial meeting in 2008. Collectively, the G-20 economies comprise 85% of global gross national product, 80% of world trade (including EU intra-trade) and two-thirds of the world population.

The G-20 was proposed by former Canadian Finance Minister Paul Martin (later, Prime Minister) for cooperation and consultation on matters pertaining to the international financial system.

Event: Years Summit (15-16 November, 2015)

Place: Antalya, Turkey

Agenda: Concrete action to slrengthen the global economy, make goal growth more inclusive, enhance the resilience of international financial system, mobilize investment for long-term growth and implement previous commitments on economic reforms and labour markets.

Asian Development Bank

The Asian Development Bank (ADB) is a regional development bank established on 22 August 1966 to facilitate economic development of countries in Asia. The bank admits the members of the UN Economic Commission for Asia and the Far East (now UNESCAP) and nonregional developed nations.

Event: Loan Support Program to Improve Urban Health in India (28 May 2015)

Arab League

The Arab League is a regional organisation of Arab states in North and Northeast Africa, and Southwest Asia. It was formed in Cairo on 22 March 1945 with six members: Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, and Syria. Yemen joined as a member on 5 May 1945. The Arab League currently has 22 members and four observers. The main goal of the league is to "draw closer the relations between member States and co-ordinate collaboration between them, to safeguard their independence and sovereignty, and to consider in a general way the affairs and interests of the Arab countries.

Event: Arab League Summit 2015
Place: Egypt
Agenda: Yeman, Libya and Joint military force among tropics were discussed.

ASEAN

The Association of Southeast Asian Nations is a geo-political and economic organization of 10 countries located in Southeast Asia, which was formed on 8 August 1967 by Indonesia, Malaysia, the Philippines, Singapore and Thailand. Since then, membership has expanded to include Brunei, Burma (Myanmar), Cambodia, Laos, and Vietnam. Its aims include the acceleration of economic growth, social progress, cultural development among its members, the protection of the peace and stability of the region, and to provide opportunities for member countries to discuss differences peacefully.

If ASEAN were a single country, it would rank as the 9th largest economy in the world and the 3rd largest in Asia in terms of nominal GDP.

Event: 27th ASEAN summit (18-22 November, 2015)
Place: Kuala Lumpur
Agenda: Discuss the significant achievements in the implementation of the Road map for an ASEAN community (2009-2015)

OPEC

The Organization of the Petroleum Exporting Countries is a cartel of twelve developing countries made up of Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates and Venezuela. OPEC has maintained its headquarters in Vienna since 1965, and hosts regular meetings among the oil ministers of its Member Countries. Indonesia withdrew in 2008 after it became a net importer of oil, but stated it would likely return if it became a net exporter in the world again.

Event: OPEC 168th Meeting (4 December, 2015)
Place: Vienna
Agenda: Negotiated the importances COP-21/CMP-11 for all OPED member countries.

APEC

Asia-Pacific Economic Cooperation (APEC) is a forum for 21 Pacific Rim countries that seeks to promote free trade and economic cooperation throughout the Asia-Pacific region. Established in 1989 in response to the growing interdependence of Asia-Pacific economies and the advent of regional economic blocs (such as the European Union and the North American Free Trade Area) in other parts of the world, APEC works to raise living standards and education levels through sustainable economic growth and to foster a sense of community and an appreciation of shared interests among Asia-Pacific countries. Members account for

approximately 40% of the world's population, approximately 54% of world GDP and about 44% of world trade.

OECD

The Organisation for Economic Co-operation and Development is an international economic organisation of 34 countries founded in 1961 to stimulate economic progress and world trade. It defines itself as a forum of countries committed to democracy and the market economy, providing a platform to compare policy experiences, seeking answers to common problems, identifying good practices, and co-ordinating domestic and international policies of its members.

The OECD originated in 1948 as the Organisation for European Economic Co-operation (OEEC), led by Robert Marjolin of France, to help administer the Marshall Plan for the reconstruction of Europe after World War II. Later, its membership was extended to non-European states. In 1961, it was reformed into the Organisation for Economic Co-operation and Development by the Convention on the Organisation for Economic Co-operation and Development. Most OECD members are high-income economies with a high Human Development Index (HDI) and are regarded as developed countries (Chile being the only OECD member which is also a member in the organisation of developing countries, the Group of 77).

Event: OECD Forum 2015

Place: Paris

Agenda: Idea factories a new age and the future of the internet.

Amnesty International

Amnesty International was established on 28 May 1961, with its headquarters at London, by Peter Benson, a British lawyer.

A worldwide organization, it investigates violations of human rights. It campaigns for the release of all prisoners of conscience, provided they have not used or advocated violence, fair, and prompt trails for all prisoners, and abolition of torture and capital punishment. It now has more than 1,100,000 members in over 150 countries, with 6,000 local groups in 70 countries in Africa, the Americas, Asia, Europe, and the Middle East. It won the Nobel Prize for Peace in 1977.

Red Cross

Red cross was established in 1864 by Jean Henri Durant. In 1859, J.H. Durant, a Swiss businessman, travelling through Italy witnessed the Battle of Solferino, when France tried to free Italy from Austrian domination, in which about 30,000 soldiers were wounded of killed. He organized relief work for the wounded soldiers and subsequently called for the formation of a permanent relief society for those wounded in war. Durant's appeal had immediate results. An international conference took place in Geneva in 1864 where 26 governments were represented. The Conference led to the Geneva Convention and the emblem of Red Cross was adopted. Each year World Red Cross and Red Crescent Day is celebrated on May 8, the birthday of its founder Henri Dunant. Its motto is Charity in War. A red cross on a white background is its symbol (it is the reverse of the flag of Switzerland). The Red Cross completed 132 years on 8 May 1994

and in it 126th year, it adopted the slogan '125 Years at Work — and Stilll Developing'

In the Middle Fast, a Red Crescent replaces The Red cross. ICRC (International Committee of the Red Cross) together with the League of Red Cross Societies, constitutes the International Red Cross. The League of Red Cross Societies was founded in 1929.

BRICS

BRICS is the acronym for an association of five major emerging national economies: Brazil, Russia, India, China, and South Africa. The grouping was originally known as "BRIC" before the inclusion of South Africa in 2010. The BRICS members are all developing or newly industrialised countries, but they are distinguished by their large, fast-growing economies and significant influence on regional and global affairs; all five are G-20 members.

As of 2014, the five BRICS countries represent almost 3 billion people which is 40% of the world population, with a combined nominal GDP of US$16.039 trillion (20% world GDP) and an estimated US$4 trillion in combined foreign reserves. As of 2014, the BRICS nations represented 18 percent of the world economy.

Brazil held the chair of the BRICS group in 2014, having hosted the group's sixth summit in 2014.

Russia chaired the 7th BRICS summit on 8-9th july 2015.

Events: 7th annual diplomatic summit (8-9 July, 2015)

Place: Ufa, Russia

Agenda: Inaugural meetings of New Development Bank were held and BRICS contingent Reserve Arrangement were discussed.

MDG – 2015

The united Nation organisation started or fixed the millenium development Goal (MDG-2015) in 2000. There are eight main aims mentioned in the goal. These goals range from halving extreme poverty rates to halting the spread of HIV/AIDS and providing universal primary education.

LIST OF PARLIAMENT OF DIFFERENT COUNTRIES

Country	Parliament Name	Country	Parliament Name
India	Sansad/Parliament	Maldeep	Majlis
Pakistan	National Assembly	Span	Cortes
Bangladesh	Jatiya Sansad	Nepal	Rastriya Panchayat
China	National Peoples Congress	Russia	Duma
Bhutan	Tsondu	France	National Assembly
Srilanka	Parliament of Sri Lanka	Iran	Majlis
Afganistan	Shora	Malasiya	Diwan Nigara
England	Parliament	Switzerland	Fedral Assembly
Canada	Parliament	Turkey	Grand National Assembly
Australia	Parliament		
USA	Congress		
Germany	Wondstag		
Taiwan	Yuan		
Japan	Daet		
Israil	Neset		

Country	Ruling Party or Coalition	Parties in opposition
India	National Democratic Alliance led by Bharatiya Janata Party	UPA, NDA and Other non-UPA, non-NDA parties
Pakistan	Pakistan Muslim League (N)	
Bangladesh	Awami League,	Jatiyo Sangshad
China	Communist Party of China	National Assembly of Pakistan
Bhutan	Bhutan Peace and Prosperity Party	People's Democratic Party
United Kindoms	Conservative Party	Labour Party
Canada	Liberal Party of Canada	Loyal Opposition
Australia	Social Democratic Party of Austria, Austrian People's Party	Freedom Party of Austria
US	Democratic Party (President), Republican Party (Legislature)	
Germany	Christian Democratic Union, Christian Social Union, Social Democratic Party of Germany	
Srilanka	National Unity Government (consists of All Ceylon Muslim Congress, Jathika Hela Urumaya, Sri Lanka Freedom Party, Up-Country People's Front, National Union of Workers, Sri Lanka Muslim Congress, United National Party, Democratic People's Front)	Illankai Tamil Arasu Kachchi
Taiwan	Kuomintang	Democratic Progressive Party
Japan	Liberal Democratic Party, Komeito	Democratic Party
Burma	National League for Democracy	Aung San Suu Kyi
Iraq	State of Law Coalition, Al-Muwatin, Al-Ahrar Bloc, Kurdistan Democratic Party, Iraq Alliance	
Israel	Likud, The Jewish Home, United Torah Judaism, Kulanu, Shas	The Knesset
Spain	People's Party	Congress of Deputies
Nepal	Communist Party of Nepal (Unified Marxist–Leninist), Unified Communist Party of Nepal (Maoist), Rastriya Prajatantra Party Nepal, Madhesi Jana Adhikar Forum, Nepal (Loktantrik)	Nepali Congress
Russia	United Russia	Shadow Cabinet
France	Socialist Party, Radical Party of the Left	National front
Iran	Moderation and Development Party	Tudeh Party
Malaysia	National Front	Barisan Nasional
Turkey	Justice and Development Party	Republican Reople's Party


BAJAJ AUTO -0.11%
2.65
BAJAJ HIND -1.09%
2.25
203.80
NATIONAL STOCK EXCHANGE




11.560
1.286
2.286
0.156
N/A
0.12%
1.51%
0.11%
0.15%

ECONOMY

ECONOMY

Micro-Macro Economics

- Demand
- Supply
- Price
- Elasticity
- Marginal Utility
- Equilibrium
- Revenue & Cost
- Profit & Loss
- Recession & Depression
- Market
- Factors of Production
  - Land
  - Labour
  - Capital
  - Entrepreneur
- Inflation

Public Finance

- Budget
  - Revenue
  - Expenditure
  - Deficit
- Tax
  - Types
  - Classification
  - Methods
- Banking & Insurance
- Deficit Financing in India
- Government Subsidies
- Finance Commission
- Stock Exchanges
- SEBI

Indian Economy

- National Income
  - Terms
  - Measurement
- Human Development Index
- Five Year Plans
- Poverty
- Unemployment
  - Type
  - Schemes
- Foreign Trade
  - Foreign Exchange
  - Balance of Payment
  - Export – Import
- Agriculture
  - Green Revolution
  - NABARD
  - Food Security
- Industries
  - Manufacturing
  - Services

MICRO–MACRO ECONOMICS

Demand

Demand refers to how much (quantity) of a product (goods) or service is desired by buyers. The quantity demanded is the amount of a product people are willing to buy at a certain price; the relationship between price & quantity demanded is known as the demand relationship. The law of demand states that as the price of a good increases (or decreases), the quantity of that good demanded will decrease (increase).

Supply

Supply represents how much the market can offer. The quantity supplied refers to the amount of a certain good producers are willing to supply when receiving a certain price. The correlation between price & how much of a good or service is supplied to the market is known as the supply relationship.

The law of supply states that as the price of a good increases (or decreases), the quantity of that good supplied will increase (decrease).

Price

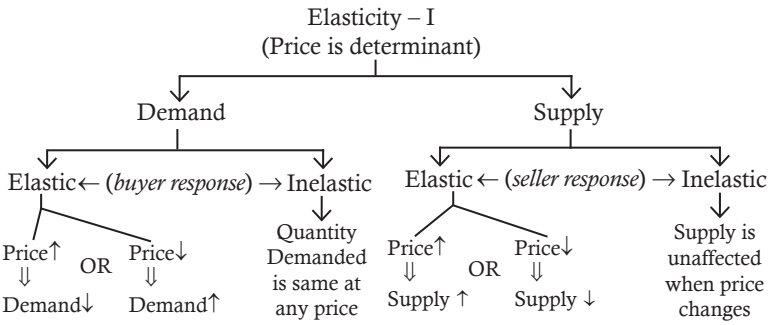
Price is the amount of money that has to be paid to acquire a given product. Price mechanism is based on the principle that only by allowing prices to move freely will the supply of any given commodity match demand. If supply is excessive, prices will be low & production will be reduced, this will cause prices to rise until there is a balance of demand & supply. In the same way, if supply is inadequate, prices will be high, leading to an increase in production that in turn will lead to a reduction in prices until both supply & demand are in equilibrium.

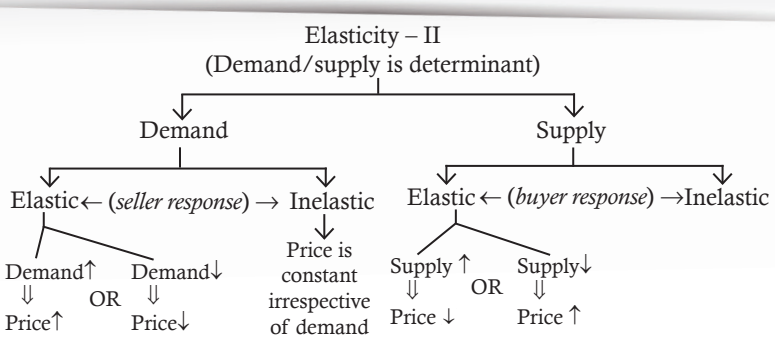
Elasticity

The concept of elasticity is intended to measure the degree of responsiveness of a buyer or seller to a change in a key determinant, in particular price.

OR

Elasticity is a ratio of relative changes in quantity demanded/ supplied & price.



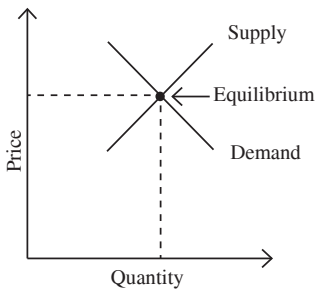


Marginal Utility

Marginal utility is the additional satisfaction a consumer gains from consuming one more unit of a goods or service. It is used by the economist to determine how much of an item a consumer will buy.

Equillibrium

When supply & demand are equal (i.e. when the supply function & demand function intersect) the economy is said to be at equilibrium. At this point, the suppliers are selling all the goods that they have produced & consumers are getting all the goods that they are demanding.



Revenue

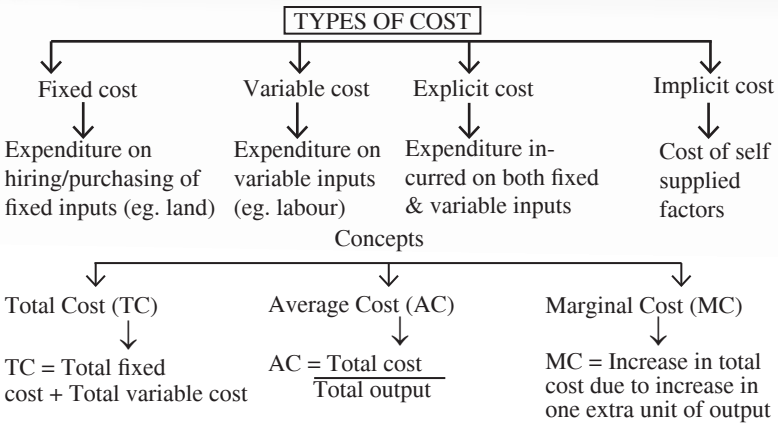
Revenue refers to the amount received by a firm or an individual from the sale of a given quantity of a commodity in the market. It is directly influenced by sales level, i.e. as sales increases, revenue also increases.

REVENUE

Total Revenue (TR)	Average Revenue (AR)	Marginal Revenue (MR)
TR = Quantity of commodity sold × Price of commodity	$AR = \frac{TR}{No.\ of\ units\ sold}$	MR = TR from number of units sold – TR from sale of one more unit of commodity

Cost

Cost is defined as the money expenditure incurred by the producer to purchase (or hire) factors of production & raw materials to produce goods & services.



Profit

Profit is the surplus of revenue over total cost of production.

Profit = Total Revenue – Total Cost

Normal profit: This occurs when total revenue is equal to total cost. This is the Break-even Point for a firm. It is the minimum profit level to keep the firm in the industry in the long run.

Supernormal profit: This occurs when total revenue is more than total cost

Loss

Loss is a situation in which a producer does not earn the level of profit that would justify remaining in business in the long run.

Loss = Total cost – Total revenue

Recession

A period of temporary economic decline during which trade and industrial activity are reduced, generally identified by a fall in GDP in two successive quarters.

Depression

A period during which business, employment, & stock-market values decline severely or remain at a very low level of activity.

MARKET

Market is a place where forces of demand & supply operate, & where buyers and sellers interact to trade goods, services, or contracts or instruments, for money or barter.

FEATURES OF MARKET STRUCTURE

S. No.	Market	Types of product	Numbers of sellers/firms	Entry & exit	Price determination
1.	Perfect competition	Homogeneous product	Many	Freedom of entry & exit	Firms are price-takers
2.	Monopoly	Unique	One	Barriers to entry	Firm is price-makers
3.	Oligopoly	Differentiated products	Few	Barriers to entry	Firm are price-makers
4.	Monopolistic Competition	Differentiated products	Many	Freedom of entry & exit	Firms are price - makers

Factors of Production

An economic term to describe the inputs that are used in the production of goods or services in the attempt to make an economic profit are called factors of production. The factors of production include – land, labour, capital & entrepreneurship.

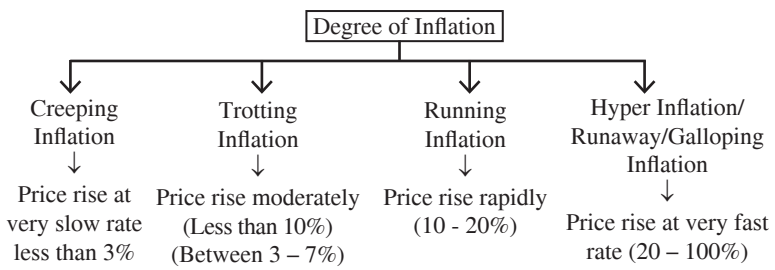
- **Land:** Represents all natural resources used in the production of goods.
- **Labour:** All work that labourers & workers perform at all levels of an organization.
- **Capital:** All of the tools, machinery, cash used to produce a goods or service.
- **Entrepreneur:** Individual who takes an idea & attempts to make an economic profit from it by combining all other factors of production.

Inflation

In a broad sense, inflation is that state in which the prices of goods & services rise on the one hand & value of money falls on the other.

Types of Inflation

1. **Demand Pull Inflation:** It is that inflation when prices rise due to higher demand for goods & services over the available supply.
2. **Cost Push Inflation:** It is the type of inflation in which prices rise due to increased inputs costs.



Measurement of Inflation

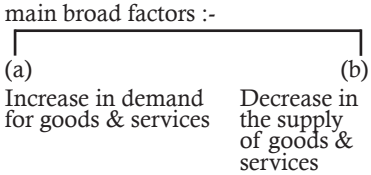
1. **General Price or Wholesale Price Index:** It measures the changes in average prices of goods & services. A base year is selected & its index is assumed as 100 & on this basis price index for the current year is calculated. If the index of the current year is below 100 it indicates the state of deflation &, on the contrary, if index of the current year is above 100 it indicates the state of inflation.
2. **Consumer Price Index (CPI):** It measures the average change in prices paid by ultimate consumers for a particular basket of goods & services over a period of time. CPI actually measures the increase in prices a consumer will have to pay for the designated commodity basket which may be revised every 4 – 5 years to factor in changes in consumption pattern.

Price Index = Current year's price/base year's price × 100

In India, inflation is measured in terms of the WPI.

Causes of Inflation

The inflation occurs due to two main broad factors :-



(a) **Factors causing an increase in demand for goods & services:**
   (i) Increase in public expenditure
   (ii) Increase in pvt. expenditure
   (iii) Increase in exports
   (iv) Reduction in taxation
   (v) Rapid growth of population
   (vi) Black money
   (vii) Deficit financing
   (viii) Cheap money policy
   (ix) Increase in consumer spending
   (x) Department of Tax internal debts.

(b) Factors causing decrease in supply of goods & services:
   (i) Shortage of supplies of factors
   (ii) Industrial disputes
   (iii) Natural calamities
   (iv) Loop-sided Production
   (v) Hoarding by traders
   (vi) Operation of Law of Diminishing Returns.

Impact of Inflation

Inflation is the most regressive form of taxation as it affects the poor and vulnerable sections of the society the most. Such a situation leads to increasing income disparities.

Inflation dampens exports by making our products expensive and, conversely, makes imports attractive. Such a situation may warrant formal or informal devaluation of the currency in order to make our exports competitive.

Inflation leads to recession, as people with fixed incomes set apart an increasing share of their income to meet the growing costs of essential commodities, leaving very little for expenditure on non-essential terms. The production of such items has to be reduced, leading to shutdowns and recession.

Policy measure to control inflation

The issue of inflation is addressed from both demand and supply sides. Demand management implies putting a check on the demand of the public for goods and services. Demand management is achieved by measures such as postponing public expenditure, reducing up excess liquidity either through taxes or saving schemes and restrictions on ad hoc treasury bills. While such measures help contain the money supply, there is a danger that these will contract the economy and lead to an increase in unemployment. Rationalisation of excise and import duties of essential commodities to higher the burden on poor.

RBI assists in controlling inflation through monetary measures such as quantitative and selective credit controls and by manipulating the Cash Reserve Ratio (CRR) and the Statutory Liquidity Ratio (SLR). These are the monetary policies adopted by government.

On the supply side, the mechanism of Public Distribution System (PDS) ensures availability of essential commodities for the vulnerable sections of society. This helps to maintain price levels. Fixation of maximum prices to eliminate the incentive for hoarding and speculative activity in foodgrains. Control over private trade in foodgrains. Adoption of Open General Licence (OGL) to ease the imports of sugar, pulses, etc.,in case of shortages. Coupled with this is the open market sale of rice and wheat resorted to by FCI from its buffer stock in times of price rise.

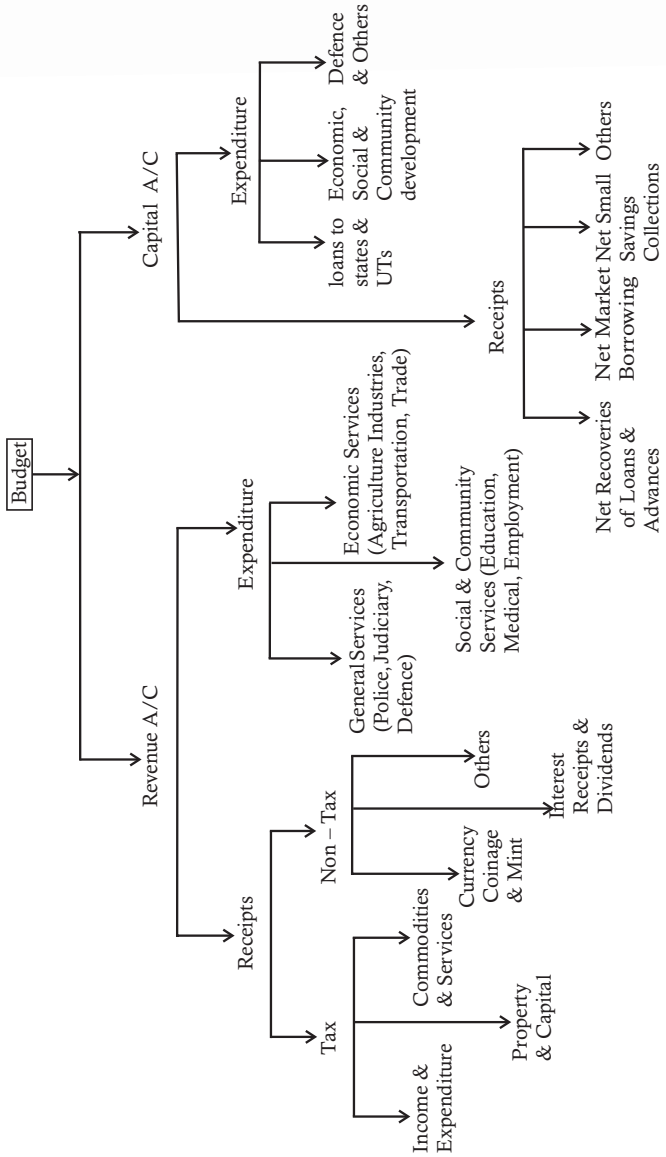
Related Terms

1. **Deflation:** Deflation is that state in which the value of money rises & the price of goods & services falls.
2. **Stagflation:** It refers to the situation of coexistence of stagnation & inflation in the economy. Stagnation means low National Income growth & high unemployment.
3. **Disinflation:** The rate of inflation at a slower rate is called disinflation.

PUBLIC FINANCE

Budget

Budget is an annual financial statement. The Budget in India is divided into 2 parts – Revenue Account & Capital Account.



New Classification of Expenditure

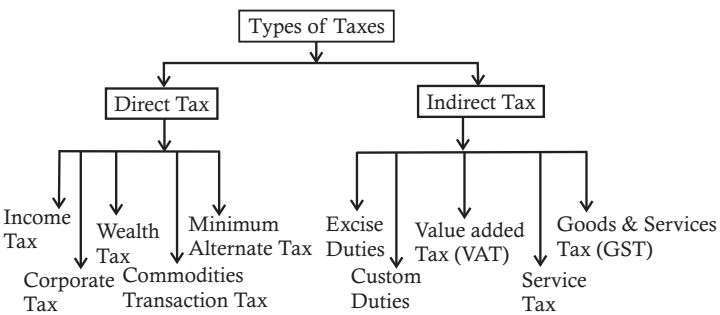
Important Terms

(1) Revenue– It is the income received by the government.
(2) Expenditure– It is the amount incurred by the government to meet day to day & regular needs.
(3) Deficit– It means shortage. The gap between the Receipts & Expenditure is called Deficit. The important types of Deficit are as follows:–
(a) Budget Deficit = Total Expenditure – Total Receipts
(b) Revenue Deficit = Revenue Expenditure – Revenue Receipts
(c) Fiscal Deficit = Total Expenditure – Total Receipts except Borrowing & Other Liabilities.
(d) Primary Deficit = Fiscal Deficit – Interest Payment

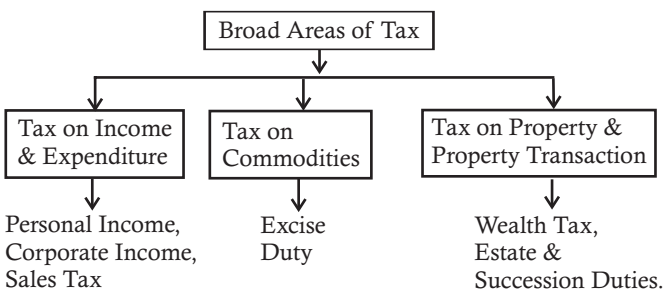
Tax

The money which public have to pay to the government so that it can pay for public services is called **tax**.

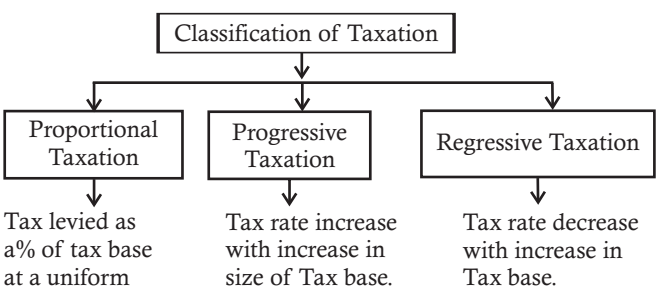
(i)



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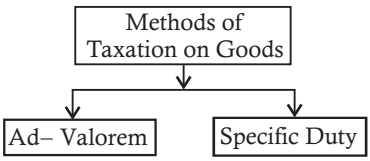
(iii)



Types of Taxes

- **Direct Tax**– The tax that people pay directly to the government is called tax.
- **Indirect Tax**– The tax burden when shifted to another persons that tax is called indirect tax.
- **Income Tax**– Tax on the personal income of the individuals.
- **Corporate Tax**– Levied on Company's profit income.
- **Wealth Tax**– Imposed on the accumulated wealth or property of every individual.
- **MAT (Minimum Altemate Tax)** – Imposed on zero tax companies (companies pay very low tax by using the provisions of exemptions, deductions, incentives, etc.
- **Excise Duties**– Tax on production of commodities.
- **Custom Duties**– Tax on Import & Export of commodities.
- **VAT (Value Added Tax)** –Tax on sale of commodities. It is a state level tax. The tax rate is imposed as a% of value added.
- **GST**– It is a uniform tax on goods & services throughout the country.

METHODS OF TAXATION OF GOODS



(1) Ad Valorem– If tax is levied as A% of the value of the goods regardless of number of units produced/ sold/ imported, then it is called ad valorem.

Eg. Price of car	Tax Amount
₹ 2 lakh	₹ 20,000
₹ 4 lakh	₹ 40,000

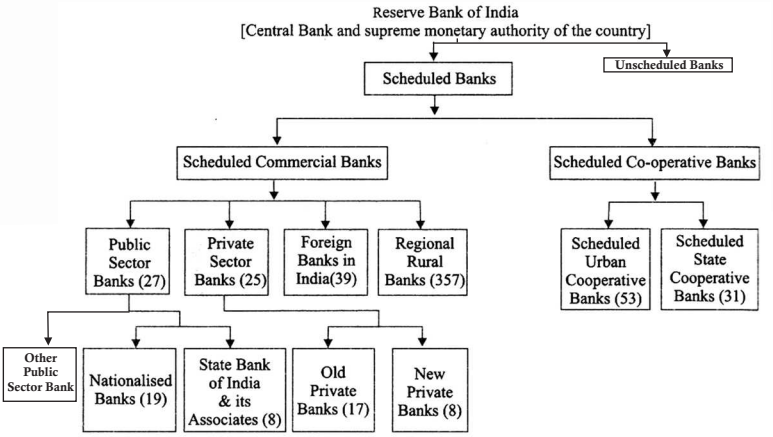
(2) Specific Duty– If tax is levied at a flat rate per unit of goods produced/ sold/ imported regardless of the value then it is called specific Duties.

Eg. Car's Price	Tax
₹ 2 lakh	₹ 10,000
₹ 4 lakh	₹ 10,000

INCOME TAX SLAB FOR FY 2015 -16

1. For Individual/HUF/Association of person	
Income tax slab (in Rs.)	Tax
0 to 2,50,000	Nil
2,50,001 to 5,00,000	10%
5,00,001 to 10,00,000	20%
Above 10,00,000	30%
2. For Senior Citizen (who is 60 years or more but less than 80 years)	
Upto Rs 3,00,000	Nil
Rs. 3,00,00 – Rs. 5,00,000	10%
Next Slabs are same as general	
3. For Super Senior citizen (80 years of age or more).	
Upto Rs 5,00,000	Nil
Next Slabs are same asa general	

Banking System



Reserve Bank of India

- It is the apex ragulatory body of Indian Banking system. Also called as the Central Bank.
- It keeps the cash reserves of all scheduled Banks & hence is know as the 'Reserve Bank'.
- It was inaugurated in April 1935.

Functions of RBI–

(a) Bank of Issue (All notes except ₹ 1 note & coins are issued by RBI. One rupee note & coins are issued by Ministry of Finance but circulated by RBI.
(b) Banker & debt manager to Government.
(c) Banker's Bank.
(d) Custodian and manager of Foreign Exchange.
(e) Controller of credit
(f) Supervision over commercial & cooperative Banks.

- **Commercial Banks**: Accept deposits, give loans and provide other financial services to earn profit. Consist of both public sector and private sector banks.
- **Public Sector Banks** : Public sector banks are those banks in which the majority of ownership is with government. The majority of ownership means, shareholding of more than 51%.
- **State Bank Group:** State Bank group means State Bank of India (SBI) and its Associates. Previous name of SBI was Imperial Bank of India. It was created in 1921 by amalgamating the three Presidency Banks of Bengal (1806), Bombay (1840) and Madras (1843). Imperial Bank of India was partially nationalized on July 1, 1955 and renamed as State Bank of India (SBI).
- **Other Nationalised Bank:** The public sector banks other than SBI and its associates are other nationalised Banks. For examples – PNB, BOI, etc.
- **The Regional Rural Banks (RRB) :** These banks were established since 1975, under RRBs Act 1976. These banks were set up by public sector banks. RRBs were established to lend to weaker section called target group like landless labour, artisan and craftsmen at concessional rate.

- **Co-Operative Banks :** Cooperative banks are established by State laws. These banks are called as cooperative banks because these have cooperation of stake holders as motive. Along with lending, cooperative banks accept deposits. NABARD (National Bank for Agriculture and Rural Development) is the apex body of cooperative sector in India.
- **NABARD :** The functions of NABARD viz., financing of agriculture and refinancing of cooperative banks and RRBs. NABARD was set up in July 1982.

Tools of Credit Control–

RBI acts as controller of credit. Control of Credit means control of lending & deposit creating capacity of the Banks. These controls result in control of money supply which is essential to control inflation & there by promote economic growth.

Some of the important measures or tools of credit control are as follows–

(1) Bank Rate– It is the rate charged by the central Bank for lending funds to commercial Banks.

(2) CRR– Cash Reserve Ratio (CRR) is a specified minimum fraction of the total deposits of customers which commercial banks have to hold as reserves with the Central Bank.

(3) Repo Rate – It is the rate at which commercial banks borrow from RBI by mortgaging their dated government securities and Treasury bills. If repo rate is increased, the banks have two options either to reduce the borrowing from RBI or borrow at higher rate from RBI and charge higher interest rate from customer. If banks borrow fewer amounts, the credit creating capacity of banks will come down and money supply will come down. If bank borrows and charges higher interest rate, the customer will borrow less. The money supply will come down. If the rate is decreased the reverse will be the case.

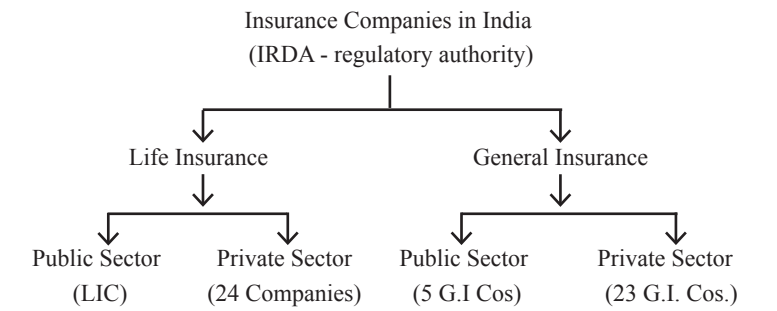
(4) Reverse Repo Rate– It is the rate at which RBI borrows from commercial Banks by mortgaging its dated Government securities and Treasury bills. If the reverse repo rate is increased, the banks have two options either to lend to RBI or lend to customer at higher interest rate. If banks lend to RBI, the money available with the bank to lend to its customer will come down. The credit creating capacity of banks and money supply will come down. If the banks raise interest rate on loans to customers at higher rate, the customer will borrow lesser amount. So, the money supply will come down.

The Pradhan Mantri Jan Dhan Yojana has set an ambitious target of bringing more than 7.5 crore un-banked families into India's banking system by opening more than 15 crore bank accounts at the rate of two bank accounts per household by 15 August 2015. The remaining hilly areas and the other 75 naxalite-affected distrricts will be covered under the Yojana by the end of August 2016.

Insurance

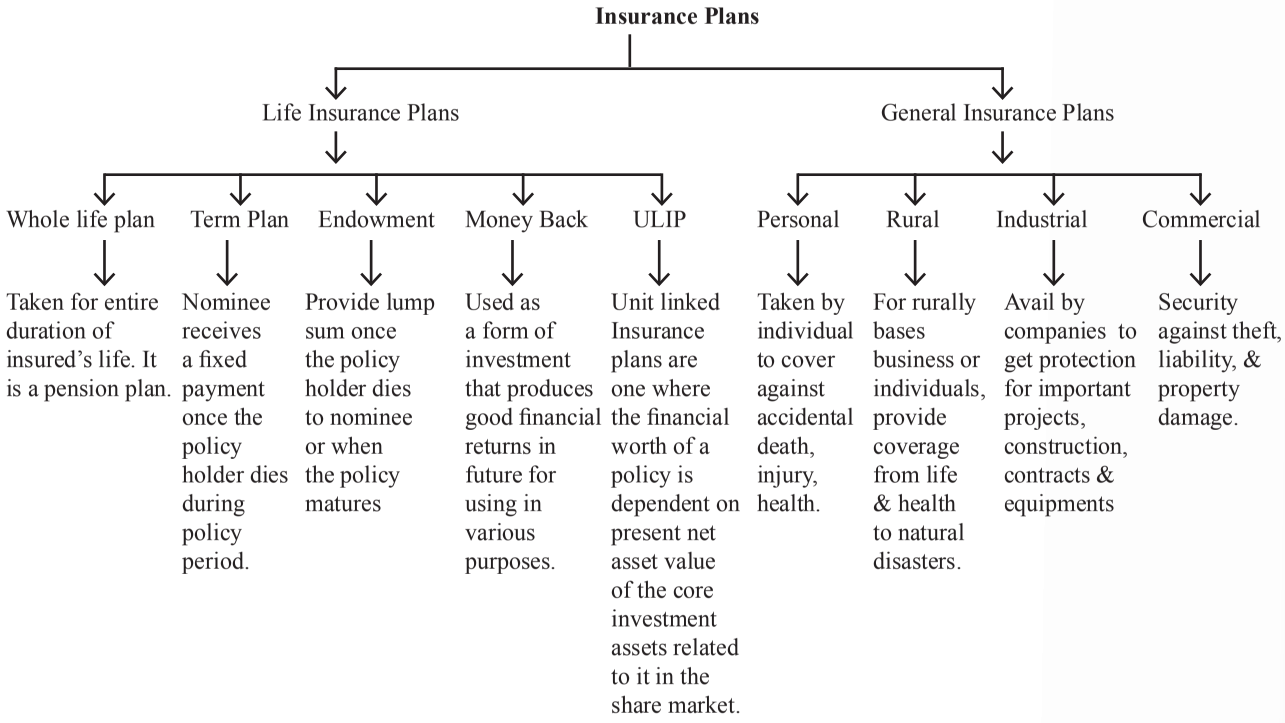
- Insurance: It is a form of risk management primarily used to hedge against the risk of a contingent, uncertain loss.
- Insurance policy: It is a financial contract between the insurer & the policy holder where the details of the policy is mentioned including the benefits & the premium that policy holder has to pay.
- Premium: It is the periodic payment made on an insurance policy. Insurance premiums are collected in monthly or quarterly or half-yearly or yearly mode.
- Major Types of Insurance:
  (a) Life Insurance: Descendent's family receives financial benefits.
  (b) Automobile Insurance: Protects policy holder against financial loss in the event of an incident involving a vehicle they own.
  (c) Health Insurance: Cover the expenditures associated to treatment & medical expenditures.
  (d) Property Insurance: Provide protection from risks associated to theft, fire, floods, etc.
- Insurance Industry in India

The Indian government passed an ordinance on January 19, 1956 whereby the life insurance sector was nationalised & the life Insurance Corporation India (LIC) came into existence. The Indian Parliament passed the General Insurance Business (Nationalisation) Act in 1972 & the general insurance sector was brought under governmental control from January 1, 1973.



Insurance Regulatory and Development Authority of India (IRDAI) is an autonomous apex statutory body which regulates and develops the insurance industry in India. It was constituted by a Parliament of India act called Insurance Regulatory and Development Authority Act, 1999 and duly passed by the Government of India.

The agency operates from its headquarters at Hyderabad, Telangana where it shifted from Delhi in 2001. The key objectives of the IRDA include promotion of competition so as to enhance customer satisfaction through increased consumer choice and lower premiums, while ensuring the financial security of the insurance market.


Insurance Plans
Life Insurance Plans
General Insurance Plans
Whole life plan
Term Plan
Endowment
Money Back
ULIP
Personal
Rural
Industrial
Commercial
Taken for entire duration of insured's life. It is a pension plan.
Nominee receives a fixed payment once the policy holder dies during policy period.
Provide lump sum once the policy holder dies to nominee or when the policy matures
Used as a form of investment that produces good financial returns in future for using in various purposes.
Unit linked Insurance plans are one where the financial worth of a policy is dependent on present net asset value of the core investment assets related to it in the share market.
Taken by individual to cover against accidental death, injury, health.
For rurally bases business or individuals, provide coverage from life & health to natural disasters.
Avail by companies to get protection for important projects, construction, contracts & equipments
Security against theft, liability, & property damage.

India's Public Debt

Public Debt– The Public Debt of the govt. of India is composed of – (a) Internal Debt & (b) External Debt.

Internal Debt comprises of market loans, compensation bonds, prize bonds & 15–year annuity certificates. It also includes borrowings of a temporary nature, viz treasury Bills issued to the RBI, commercial banks, etc & also non– negotiable, non–interest bearing securities issued to international financial institutions like the IMF, World Bank & the Asian Development Bank.

External Debt includes borrowings by Central Government from external sources & are based upon historical rates of exchange.

The total Public Dept & other liabilities of the Indian Government would come to ₹68,94, 691 crores by end March 2016; it was only ₹15, 58, 900 crores in March 2003, Central Govt's public debt & other liabilities has increased by nearly 4.5 times.

Government Subsidies

It is the money paid by government to help an reganisation industry to reduce its costs, so that it can provide products services at lower prices.

Subsidies– A sum of money granted to support an undertaking held in public interest.

Types of Subsidies –

(1) **Cash Subsidies** – Providing food or fertilizers to the consumer at prices lower than those at which government procures the commodities.

(2) **Interest or credit subsidies** – relate to loans given at rates lower than market rates. This takes the form of concessional credit to small scale industries or priority sector loans to individuals to buy a taxi, an auto-rickshaw or to set up some small enterprise by buying some equipment.

(3) **Tax subsidies** can be in the form of tax exemption of medical expenses, postponing collection of tax arrears.

(4) **Procurement subsidies** –It is the purchase of food grains at an assured price which is higher than the prevailing market price.

(5) **In-Kind subsidies** – Provision of free medical services through government dispensaries, provision of equipment to physically handicapped persons.

(6) **Regulatory subsidies** – Fixation of prices of goods produced by the public sector at less than the cost with a view to providing inputs to industry or helping certain other categories of consumers. Examples are making steel, coal or other minerals available to industry, providing electricity to farmers at a rate much lower than the cost.

Finance Commission

The Finance Commission – Under the provisions of Article 280 of the Constitution, the President is required to constitute a Finance commission every fifth year for the specific purpose of devolution of non- plan revenue resources. The functions of the Commission are to make recommendations to the President in respect of

(i) the distribution of net proceeds of taxes to be shared between the Union and the States and the allocation of share of such proceeds among the States,

(ii) the principles which should govern the payment by the Union Govt. as grants-in-aid to the States, and

(iii) any others matter concerning financial relations between the Union and the States.

The appointment of the Finance Commissioner is of great importance, for it enables the financial relation between the Centre and the units to be altered in accordance with changes in need and circumstances.

Stock Exchange in India

In India, there are small and big stock exchanges. The most prominent exchanges are National Stock Exchange (NSE) and Bombay Stock Exchanges (BSE).

National Stock Exchange NSE

The NSE is the leading stock exchange of India, located in Mumbai. nIt was established in 1993 on the recommendation of Pherwani Committee, Industrial Development Bank of India (IDBI) is the main promoter of this exchange. The number of listings in NSE is 1696.

Bombay Stock Exchange BSE

It is an Indian stock exchange located at Dalal street, Kala Ghoda, Mumbai. Established in 1875, the BSE in Asis's first stock exchange and the World's fastest stock exchange with a median trade speed of 6 micro seconds. More than 5000 companies are publicly listed in the BSE.

Top 10 Stock Exchanges of World	
1.	New York Stock Exchange
2.	NASDAQ
3.	London Stock Exchange
4.	Japan Exchange Group
5.	Shanghai Stock Exachange
6.	Hongkong Stock Exchange
7.	Euronext
8.	Shenzhen Stock Exchange
9.	TMX Group
10.	Deutsche Borse

Like wholesale price index which measures the rise/fall in the price of commodities, there are share price indices. The most prominent indices in India are **Sensex, Nifty** and **Nifty Junior**.

Sensex stands for **Sensitive index**. This is an index of Bombay Stock Exchange. This measures the price movement of top 30 company shares. The top 30 companies are called Blue chip companies.

Nifty stands for **National Index for fifty**. This and Nifty Junior are indices of National Stock Exchange. Nifty measures price movement of top fifty companies. Nifty Junior is an index of next 50 top companies.

The top companies are selected on the basis of total value of all shares that are traded in the stock exchange.

SEBI (Security and Exchange Board of India)

SEBI was established in 1988 for the development & regulation of securities market (Shares & Debentures) through a resolution of government. It was given statutory status in 1992. Its head office is in Mumbai. Its regional offices are in Kolkata, Delhi & Chennai. SEBI was authorized to regulate all merchant banks on issue activity, lay guidelines & supervise & regulate the working of mutual funds & oversee the working of stock exchanges in India.

INDIAN ECONOMY

National Income

National Income of a country is the total value of all final goods and services produced in the country in a particular period of time usually, one year. The growth of National Income helps to know the progress of the country. National Income is a flow, not a stock. In India, National Income estimates are related with the financial year, i.e. April 1 to March 31.

Measures/Concepts of National Income

1. **Gross Domestic Product (GDP):** GDP is the total money value of all final goods & services produced within the geographical boundaries of the country (produced by resident citizens + foreign nationals) during a given period of time, generally one year.

   $GDP = Q \times P,$

   Q = Total quantity of final goods & services.

   P = Price of final goods & services.

2. **Gross National Product (GNP):** GNP is the money value of total output or production of final goods & services produced by the nationals of a country during a given period of time, generally a year. In this case, the income of all the resident & non-resident citizens of a country is included whereas the income of foreign nationals who reside within the geographical boundary of the country is excluded.

   $GNP = GDP + (X - M)$

   X = Export of goods & services

   M = Import of goods & services

   X – M = Net Factor Income from Abroad (NFIA)

   So, $GNP = GDP + NFIA$

3. **Net National Product (NNP): can be calculated in 2 ways:-**

   (i) NNP at market price:

   $NNP = GNP - Depreciation$

   Depreciation means wear & tear of goods produced.

   NNP at market price includes Indirect taxes and excludes subsidies.

   (ii) NNP at factor cost: NNP at factor cost calculates National Income only on the basis of cost incurred to produce the goods & services. This cost is the payment made to the factors of production.

   $NNP_{fc} = NNP_{mp} - \text{Indirect Taxes} + \text{Subsidy}$

When NNP is obtained at factor cost, it is known as National Income.

Likewise, GDP at factor cost also can be calculated.

$GDP_{fc} = GDP_{mp} - \text{Indirect Taxes} + \text{Subsidy}$

4. **Personal Income :** It is that income which is actually obtained by nationals in one year.

   P.I. = National Income – Undistributed Profits of Corporation – Payments for Social Security Provisions –

Corporate Taxes + Government Transfer payments + Business Transfer payments + Net Interest paid by government.
SOCIAL SECURITY PROVISIONS = Payments made by employees towards pension & provident fund
TRANSFER PAYMENTS = payments made not against any productive activity. eg. – old age pension, unemployment compensation, disaster relief payment, etc.

5. **DISPOSAL PERSONAL INCOME (DPI):** Income that is available to individuals that can be disposed at their will.

DPI = Personal Income – Direct Taxes.

6. National Income at constant price & current price

NI CONSTANT PRICE = Total quantity of all final goods & services produced in a particular year × Price of base year.

Base year of National Income accounts is the year chosen to enable inter – year comparisons. The new series changes the base to 2011–12 from 2004–05

NI CURRENT PRICE = Total quantity of all final goods & services produced in a particular year × Price of goods & services in that particular year.

Measurement of National Income

Methods of Measurement

Product/Output/Production method	Income method	Consumption/Expenditure method
1. Gross value added = Output of final goods & services – Intermediate Consumption	N.I. = Total Rent + Total wages + Total Interest + Total profit	GDP = Consumption Expenditure of Consumers + Consumption Expenditure of investors or entrepreneur called investment + consumption of government
2. GDP = Gross value added + Indirect Taxes – Subsidy		

Human Development Index

The UNDP Human Development Report ranks countries on basis of measuring human development by combining indicators of the Health, Education & Income into a composite Human Development Index (HDI). The HDI classifies the World into 4 broad segments :

Very High → High → Medium → Low Human Develoment Components of HDI

HDI

(a) Health : Life Expectancy at Birth
(b) Education : Mean years of schooling, Expected years of schooling
(c) Living standards : Gross National Income Per Capita

India has been classified in the Medium Human Development Category, placed at 130 rank out of 187 countries (Human Development Report 2015) The first Indian Human Development Report was formally released by Prime Minister Mr. Bajpai on April 23, 2002. Madhya Pradesh was the first state to release state-level Human Development Report.

FIVE YEAR PLANS

Plans	Period	Growth Performance (% p.a.)		Themes
		Target	Actual	
1st Plan	(1951 - 56)	2.1	3.5	Development of primary sector
2nd Plan	(1956 - 61)	4.5	4.2	Development of public sector (Industries)
3rd Plan	(1961 - 66)	5.6	2.8	Agricultural Development, Defence Industry, Price stabilization
Annual Plan	(1966 - 69)	–	3.9	Growth with stability & Progress Towards Self-Reliance. (Nationalisation of Banks, Green Revolution).
4th Plan	(1969 - 74)	5.7	3.2	Employment, Poverty Alleviation
5th Plan	(1974 - 78)	4.4	4.7	Economic Liberalisation
Annual Plan	(1979 - 80)	–	– 5.2	Growth, Modernisation, Self-Reliance & Social Justice
6th plan	(1980 - 85)	5.2	5.5	Human Development in various aspects, Beginning of Liberalization - Privatisation- Globalization
7th plan	(1985 - 90)	5.0	5.6	Growth with Equity & Distributive Justice
Annual Plan	(1990 - 92)	–	3.4	Equity with Social Justice
8th Plan	(1992 - 97)	5.6	6.5	Towards more Inclusive Growth
9th Plan	(1997 - 2002)	6.5	5.5	Faster more Inclusive & Sustainable Growth
10th Plan	(2002 - 07)	7.9	7.7	
11th Plan	(2007 - 12)	9.0	8.0	
12th Plan	(2012 - 17)	8%		

Poverty

Poverty can be defined as a social phenomenon in which a section of the society is unable to fulfil even its basic necessities of life.

Magnitude of Poverty in India

The planning commission of India has estimated rural and urban poverty in India from the sixth Five year plan ownwards.

Type of Poverty

1. Absolute
2. Relative

Rural & Urban Poverty

I. Rural Poverty

Main Reasons for Rural Poverty

1. Rapid population growth.
2. Lack of capital.
3. Lack of alternative employment opportunities other than agricultural.

4. Excessive population pressure on agriculture.
5. Illiteracy
6. Regional disparities.
7. Joint family system.
8. Child marriage tradition.
9. Indifferent attitude towards investment.
10. Lack of proper implementation of public distribution system.

Government Efforts for Eliminating Rural Poverty

1. Legal elimination of bonded labourers.
2. Preventing the centralisation of wealth by modifying the law.
3. Antyodaya plan.
4. Small Farmer Development Programme (SFDP).
5. Drought Area Development Programme (DADP).
6. Twenty Point Programme
7. Food for Work Programme
8. Minimum Needs Programme (MNP).
9. Integrated Rural Development Programme (IRDP).
10. National Rural Employment Programme (NREP).
11. Rural Labour Employment Guarantee Programme (RLEGP).
12. Jawahar Gram Samriddhi Yojana (JGSY) (Formerly known as Jawahar Rojgar Yojana).
13. TRYSEM scheme.
14. Family Planning/Welfare programme for population control.
15. Employment Assurance Scheme.
16. Scheme for Rural artisans / craftsmen.
17. DWCRA programme.
18. Swarna Jayanti Gram Swarozgar Yojana.
19 Mahila Samriddhi Yojana.
20 National Social Assistanc Programme (NSAP)
21 Group Life Insurance Scheme for Rural Areas.
22. Rural Housing Programme
23. Pradhan Mantri Gramodaya Yojana (PMGY)
24. Swarna Jayanti Gram Swarojgar Yojana
25. Sampurna Gramin Rojgar Yojana
26. Indira Awaas Yojana
27. Samagra Awaas Yojana.
28. Pradhan Mantri Rojgar Yojana.
29. Agriculture Income Insurance Scheme.
30. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).

II. Urban Poverty

Main Reasons for Urban Poverty

1. Migration of rural youth towards cities.
2. Lack of vocational education / training.
3. Limited job opportunities of employment in the cities.
4. Rapid increase in population.
5. Lack of housing facilities.
6. No proper implementation of public distribution system (PDS).

Government Efforts for Eliminating Urban Poverty

1. Emphasis on vocational education.
2. Nehru Rozgar Yojana (NRY).
3. Self-Employment Programme for the Urban Poor (SEPUP).
4. Financial assistance for constructing houses.
5. Self-Employment to the Educated Urban Youth (SEEUY) programme.
6. Prime Minister's Rozgar Yojana (Also implemented in rural areas).
7. National Social Assistance Programme.
8. Urban Basic Services for the Poor (UBSP) programme.
9. Prime Minister's Integrated Urban Poverty Eradication Programme (PMIUPEP).
10. Swarna Jayanti Shahri Rozgar Yojana.

Unemployment

In broad sense a state of unemployment appears when a labour does not obtain employment opportunity despite his willingness to work on existing wage rate.

Different Types of Unemployment in India

1. **Structural Unemployment:** This type of unemployment is associated with economic structure of the country, i.e. rapidly growing population, technological change and their immobility fall in rate of capital formation.
2. **Under-employment:** Those labourers are under-employed who obtain work but their efficiency and capability are not utilised at their optimum and as a result they contribute in the production upto a limited level.
3. **Disguised Unemployment:** If a person does not contribute anything in the production process or in other words, if he can be removed from the work without affecting the productivity adversely, he will be treated as disguisedly unemployed. The marginal productivity of such unemployed person is zero.
4. **Open Unemployment:** When the labourers live without any work and they don't find any work to do, they come under the category of open unemployment. Educated and unskilled labouress unemployment are included in open unemployment.

NREGS (National Rural Employment Guarantee Scheme)

NREGS was started by the UPA Government as a national programme to provide 100 days of employment to begin with through asset-creating public works every year at minimum wages to one-able bodied person in every poor class household.

The National Rural Employment Guarantee Act came into force in 2006 in India's 200 most backward districts. In 2007, it was extended to another 130 districts. With effect from April 1,2008, the Act is to cover all districts.

The following are the major short-comings of NREGS:

Lack of adequate professional staff

- Lack of project planning
- Bureaucratic resistance of NREGA on account of the widely held belief that it is much more difficult to make money under NREGS as compared with other employment programmes.
- Lack of transparency and absence of social audit
- Inappropriate rates of payment.

VARIOUS DEVELOPMENT AND EMPLOYMENT PROGRAMMES IN INDIA – AT A GLANCE

Programme/Plan/ Institution	Year of beginning	Objective/Description
Command Area Development Programme (CADP)	1974-75	To ensure better and rapid utilisation of irrigation capacities of medium and large projects
Twenty Point Programme (TPP)	1975	Poverty eradication and raising the standard of living

Programme/Plan/ Institution	Year of beginning	Objective/Description
National Institution of Rural Development	1977	Training, investigation and advisory organisation for rural development
Antyodaya Yojana	1977-78	To make the poorest families of the village economically independent (only in Rajasthan)
Training Rural Youth for Self-Employment (TRYSEM)	1 August 15,1979	Programme of training rural youth for self-employment.
Integrated Rural Development Programme (IRDP)	October 2, 1980	All-round development of the rural poor through a programme of asset endowment for self-employment
National Rural Employment Programme	1980	To provide profitable employment opportunities to the rural poor
Rural Landless Employment Guarantee Programme (RLEGP)	August 15, 1983	For providing employment to landless farmers and labourers
Self-Employment to the Educated Unemployed Youth (SEEUY)	1983-84	To provide financial and technical assistance for self- employment
National Fund for Rural Development (NFRD)	February 1984	To grant 100% tax rebate to donors and also to provide financial assistance for rural development projects
Industrial Reconstruction Bank of India	March 1985	To provide financial assistance to sick and closed industrial units for their reconstruction
Council for Advancement of People's Action and Rural Technology (CAPART)	September 1, 1986	To provide assistance for rural prosperity
Self-Employment Programme for the Urban Poor (SEPUP)	September 1986	To provide self-employment to urban poor through provision of subsidy and bank credit
Jawahar Rozgar Yojana	April 1989	For providing employment to rural unemployed
Nehru Rozgar Yojana	October 1989	For providing employment to urban unemployed
Members of Parliament Local Area Development Scheme (MPLADS)	December 23, 1993	To sanction Rs. 1 crore per year to every Member of Parliament for various development works in their respective areas through DM of the district
Scheme of Infrastructural Development in Mega Cities (SIDMC)	1993-94	To provide capital through special institutions for water supply, seewage, drainage, urban transportation, land development and improvement of slum projects undertaken in Mumbai, Kolkata, Bangalore, Chennai and Hyderabad
District Rural Development Agency (DRDA)	1993	To provide financial assistance for rural development
Mahila Samridhi Yojana	October 2, 1993	To encourage the rural women to deposit in Post Office Saving Account
Kasturba Gandhi Education Scheme	August 15, 1997	To establish girls schools in districts having low female literacy rate

Programme/Plan/ Institution	Year of beginning	Objective/Description
Swarna Jayanti Shahari Rozgar Yojana (SJSRY)	December 1997	To provide gainful employment to urban unemployed and under employed poor through self-employment or wage employment
Annapurna Yojana	March 1999	To provide 10 kg. foodgrains to senior citizens (who did not get pension)
Swarna Jayanti Gram Swarozgar Yojana.	April 1999	For eliminating Rural poverty and unemployment and promoting self-employment
Jan Shree Bima Yojana	Aug. 10, 2000	Providing Insurance Security to people living below poverty line
Pradhan Mantri Gramodaya Yojana	2000	To fulfil basic requirements in rural areas
Antyodaya Anna Yojana	Dec. 25, 2000	To provide food security to poor
Pradhan Mantri Gram Sadak Yojana (PMGSY)	Dec. 25, 2000	To line all villages with Pacca Road
Valmiki Ambedkar A was Yojana (VAMBAY)	Dec. 2,2001	Constructing Slum houses in urban areas.
Vande Matram Scheme	Feb. 9, 2004	Major initiative in public-private partnership during pregnancy check-up.
National Food for Work Programme	Nov. 14, 2004	Programme to intensify the generation of supplementary wage employment.
Janani Suraksha Yojana	April 12, 2005	Providing care to expectant mothers.
Bharat Nirman Programme	Dec. 16,2005	Development of Rural Infrastructure including six components : Irrigation, Water Supply, Housing, Road, Telephone and Electricity.
National Rural Employment Guarantee Scheme (MNREGA)	Feb. 2, 2006	To provide at least 100 days wage employment in rural areas.

FOREIGN TRADE

Foreign Trade deals with export and import of goods & services between nations.

Composition of India's Foreign Trade

	Export-Items		Import-Items
I.	Agricultural & Allied (coffee, tea, fruits & vagetables)	I.	Food & Allied Products ↓ Cereals, Pulses, Edible oils
II.	Ores & Minerals	II.	Fuel
III.	Manufactured Goods ↓ Gems & Jwellery, Drugs & Pharmaceuticals, manufactures of metals, Transport Equipment, Machinery & Instruments, Electronic Goods, Readymade Garments, Handicrafts	III.	Fertilizers & Capital Goods ↓ Machinery (except electrical & machinery, Transport Equipment

IV.	Crude & Petroleum	IV.	Others ↓ Chemicals, Pearls, precious & semi-precious stones, gold & silver.
V.	Others		Electronic Goods

Balance of Trade = Export – Import

Balance of payment: The BOP of a country is a systematic record of all economic transactions between the 'residents' of a country and the rest of the world. It presents a classified record of all receipts on account of good exported, services rendered & capital received by 'residents' & payments made by them on account of goods imported & services received from the capital transferred to 'non-residents'.

BOP accounts consists of 2 accounts – Current & capital A/c. Current A/c includes all the debit & credit entries of invisible items side-by-side with trade items, while the capital A/c is related with the entries of capital transactions in the country.

BOP: At a Glance

A. Current A/c:
   1. Visible Balance of trade (merchandise)
   2. Invisible BOT – a. Service: Tourism, Transport, Software.
   b. Private transfers
   c. Account of Investment Income

B. Capital A/c
   a. FDI: India & Abroad

FDI: Foreign Direct Investment is considered to be the most attractive type of capital flow for emerging economy as it is expected to bring latest technology & enhance production capabilities of the economy.

   b. Portfolio Investment: Loans, Banking Capital, NRI Deposits, shares, debentures.

Related Terms

1. **Exchange Rate:** It is the rate at which home currency is exchanged for one unit of foreign currency.
   For example ₹50 = US $1
2. **Depreciation:** Increase in the exchange rate, i.e. fall in external value of domestic currency because of more demand for foreign currency (less supply of foreign currency) more supply of (less Demand of) Domestic currency is called depreciation.
3. **Appreciation:** Fall in the exchange rate, i.e increase in the external value of domestic currency, due to more demand for home currency (or less supply of home currency) or less demand for (or more supply of) foreign currency is called appreciation.
4. **Devaluation:** Reduction in the external value of home currency is called Devaluation. For example changing the exchange rate from ₹50 = US $1 to ₹75 = US $1 is called devaluation. Devaluation is aimed at increasing export of the country.
5. **Foreign Exchange Reserves:** Also called *forex reserves* are assets held by a central bank or other monetary authority, usually in various reserve currencies, mostly the US dollar, & used to back its liabilities.
6. **Foreign Exchange:** System of trading in & converting the currency of one country into of another.

AGRICULTURE

Features of Indian Agriculture Sector

(1) Accounts for almost 27% of GDP
(2) Contributes 21% of total exports
(3) Provides employment to around 65% of the total workforce
(4) Provides raw materials to several industries

GREEN REVOLUTION IN INDIA

Since the mid-1960's, the traditional agricultural practices are gradually being replaced by modern technology & farm practices in India & veritable revolution is taking place in our country. American Scientist **Dr. William Grande** termed it as **Green Revolution**. During the middle of 60s, Indian agricultural scientists developed a number of new high yielding varieties of wheat by processing wheat seeds imported from Mexico. These varieties were having production potentialities of 60 – 65 quintals per hectare.

As a result Green Revolution ensured India's self-dependence in foodgrains. The credit for it goes not only to Nobel Laureat Dr. Norman Borlaug but also to Dr. M. S. Swaminathan.

Second Green Revolution (Strategy Adopted in 11th Plan)

The urgent need for taking agriculture to a higher trajectory of 4 per cent annual growth can be met only with improvement in the scale as well as quality of agricultural reforms undertaken by the various States and agencies at the various levels. These at efficient use of resources and conservation of soil, water and ecology on a sustainable basis, and in a holistic framework. Such a holistic framework must incorporate financing of rural infrastructure such as water, roads and power.

Evergreen Revolution

The pioneer of Indian green revolution Mr. M.S. Swaminathan, presently chairman of National Commission on farmers gave a new call for **'Evergreen Revolution'** for doubling the present production level of foodgrains from 210 million tonnes to 420 million tonnes. For making **'Evergreen Revolution'** a success, he stressed on adopting **organic farming**. He also mentioned four pre-requistes for getting the success:

i. Promoting soil health.
ii. Promoting 'Lab to Land exhibitions.
iii. Making rainwater harvesting compulsory.
iv Providing credit to farmers on suitable conditions.

AGRICULTURAL REVOLUTION IN A NUT SHELL

Revolution	Area
1. Green	Foodgrain production
2. White	Milk
3. Yellow	Oil seeds
4. Blue	Fisheries
5. Red	Meat/Tomato
6. Golden	Fruits apple
7. Grey	Fertilisers
8. Black/ Brown	Non-conventional & Energy Sources
9. Silver	Eggs
10. Round	Potato

FOOD SECURITY

World Development Report defined food security as "access by all people at all times to enough food for an Active, healthy life".

Main components of the food security system

1. Promoting domestic production to meet the demands of the growing population as also to reduce under-nutrition among quite a large section of the population.
2. Providing minimum support prices for procurement & storage of food items.
3. Operating a Public Distribution System.
4. Maintaining buffer stocks so as to take care of natural calamities resulting in temporary shortage of food.

Public Distribution System (PDS)

- It is established by the Government of India in an Indian Food Security system.
- It distributes subsidized food & non-food items to India's poor.
- Scheme was launched in India on June 1997.
- Major commodities distributed include staple foodgrains, such as wheat, rice, sugar, and kerosene oil, through a network of public distribution shops, (also known as ration shops) established in several states across the country.
- Food Corporation of India procures and maintains the PDS.

Minimum Support Price of Agriculture Production

Minimum Support Price announced by the government is that price at which government is ready to purchase the crop from the farmers directly if crop price becomes lower to MSP. As a result, market price of the crop never comes down from the levels of MSP. The minimum price security gives incentives to farmers to increase their production.

NABARD

A National Bank for Agriculture and Rural Development (NABARD) or the National Bank, for short, was, therefore; set up in July 1982 by an Act of Parliament to take over the functions of ARDC and the refinancing functions of RBI in relation to co-operative banks and RRBs. NABARD is linked originally with the RBI by the latter contributing half of its share capital the other half being contributed by the Government of India and nominating three of its Central Board Directors on the board of NABARD, besides a Deputy Governor of RBI being appointed as Chairman of NABARD.

Functions of NABARD

(i) It provides refinance facilities to all banks and financial institutions lending to agriculture and rural development.

(ii) It provides short-term, medium-term and long-term credits to State Co-operative Banks (SCBs), RRBs, LDBs and other financial institutions approved by RBI.

(iii) NABARD gives long-term loans (up to 20 years) to State Governments to enable them to subscribe to the sharre capital of co-operative credits societies.

(iv) NABARD gives long-term loans to any institution approved by the Central Government.

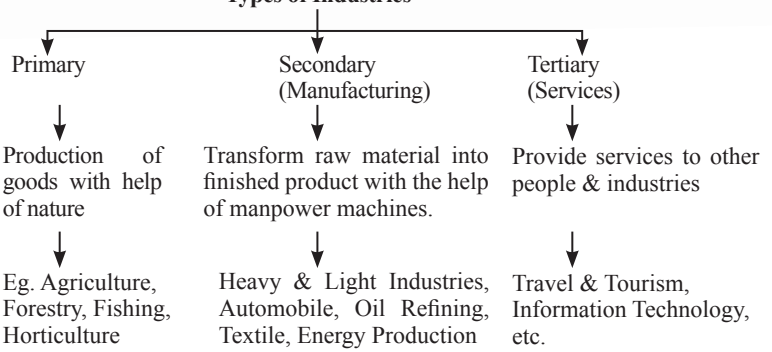
(v) NABARD has the responsibility of co-ordinating the activities of Central and State Governments, the Planning Commission and other all- India and State level institutions entrusted with the development of small scale industries, village and cottage industries, rural crafts, industries in the tiny and decentralised sectors, etc.

(vi) It has the responsibility to inspect RRBs and co-operative banks, other than primary co-operative societies; and

(vii) It maintains a Research and Development Fund to promote research in agriculture and rural development.

INDUSTRIES

Types of Industries



Liberalisation: Liberalisation is of human resources commonly known as free trade. It implies removal of restrictions & barriers to free trade.

1. **Privatisation:** Privatisation can be partner and players in the global defined as the transfer of ownership arena & control of public sector units to private individuals or companies.
2. **Globalisation:** It refers to a process whereby there are social, cultural, technological exchanges across the border.

MAHARATNA CPSEs (Central Public Sector Enterprises)

Criteria for grant of Maharatna status :

The CPSEs fulfilling the following criteria are eligible to be considered for grant of Maharatna status.

(i) Having Navratna status.

(ii) Listed on Indian stock exchange with minimum prescribed public shareholding under SEBI regulations.

(iii) Average annual turnover of more than Rs. 25,000 crore, during the last 3 years.

(iv) Average annual net worth of more than Rs. 15,000 crore, during the last 3 years.

(v) Average annual net profit after tax of more than Rs. 5,000 crore, during the last 3 years.

(vi) Should have significant global presence/international operations.

Companies:

1. Bharat Heavy Electricals Limited
2. Coal India Limited
3. GAIL (India) Limited
4. Indian Oil Corporation Limited
5. NTPC Limited
6. Oil & Natural Gas Corporation Limited
7. Steel Authority of India Limited

Navratna CPSEs (Central Public Sector Enterprises)

Criteria for grant of Navratna status :

The Miniratna Category – I and Schedule 'A' CPSEs, which have obtained 'excellent' or 'very good' rating under the Memorandum of Understanding system in three of the last five years, and have composite score of 60 or above in the six selected performance parameters, namely,

(i) net profit to net worth,
(ii) manpower cost to total cost of production/services,
(iii) profit before depreciation, interest and taxes to capital employed,
(iv) profit before interest and taxes to turnover,
(v) earning per share and
(vi) inter-sectoral performance.

Companies:

1. Bharat Electronics Limited
2 Bharat Petroleum Corporation Limited
3. Container Corporation of India Limited
4. Engineers India Limited
5. Hindustan Aeronautics Limited
6. Hindustan Petroleum Corporation Limited
7. Mahanagar Telephone Nigam Limited
8. National Aluminium Company Limited
9. National Buildings Construction Corporation Limited
10. NMDC Limited
11. Neyveli Lignite Corporation Limited
12. Oil India limited.
13. Power Finance Corporation Limited
14. Power Grid Corporation of India Limited
15. Rashtriya Ispat Nigam Limited
16. Rural Electrification Corporation Limited
17. Shipping Corporation of India Limited

INDUSTRIAL POLICY 1991: AN OVERVIEW

(A) Main Features (objective)

- to maintain a sustained growth in productivity.
- to enhance gainful employment.
- to achieve optimum utilisation of human resources.
- to attain international competitiveness
- to transform India into a major partner and players in the global arena.

(B) Main Focus on

- deregulating Indian industry.
- allowing the industry freedom & flexibility in responding to market forces
- providing a policy regime which facilitates and fosters growth of Indian industry

(C) Policy Measures

(i) Liberalisation of Industrial Licensing Policy.
(ii) Introduction of Industrial Entrepreneur's Memorandum (i.e. no industrial approval is required for industries not requiring compulsory licencing).
(iii) Liberalisation of Locational Policy.
(iv) Liberalised policy for Small Scale Sectors.
(v) Non-Resident Indians Scheme (NRIs are allowed to invest upto equity on non-repatriation basis in all activities except for a small negative list).
(vi) Electronic Hardware Technology Park (EHTP)/ Software Technology Park (STP) Scheme for building up strong electronic industry to enhance exports.
(vii) Liberalised policy for Foreign Direct Investment (FDI).

AGRICULTURE

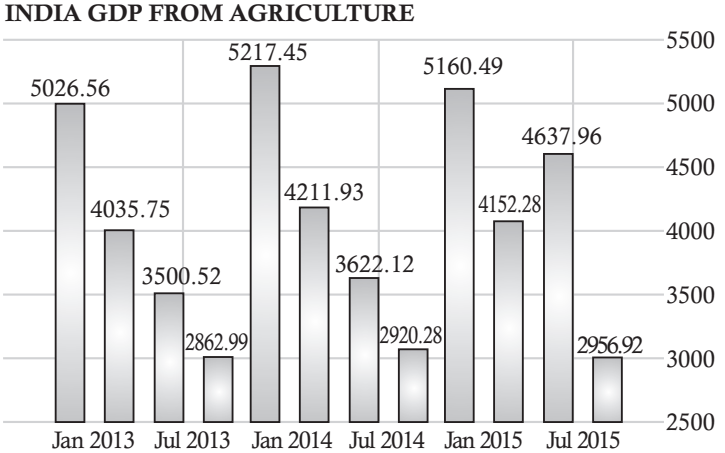
Agriculture plays a vital role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP).

There are two major agricultural seasons in India: Kharif and Rabi. Kharif season lasts from April to September (summer); rice (paddy) is the season's main crop. Rabi season lasts from October to March (winter); wheat is the season's main crop. Total food grains production in India reached an all-time high of 257 million tonnes in FY14.

India has the second largest agricultural land in the World with 157.35 million hectares of land available.

Agriculture sector in India contributes 16% of GDP & 10% of export earnings.

INDIA GDP FROM AGRICULTURE



Agricultural export constitutes 10 per cent of the country's exports and is the fourth largest exported principal commodity. The agro industry in India is divided into several sub segments such as canned, dairy, processed, frozen food to fisheries, meat, poultry, and food grains.

As per the 4th Advance Estimates, food grain production is estimated at 252.68 million tonnes (MT) for 2014-15. Production of pulses estimated at 17.20 million tonnes.

With an annual output of 138 MT, India is the largest producer of milk. It also has the largest bovine population. India is the largest importer of pulses at 19.0 MT and 3.4 MT, respectively. India, the second-largest producer of sugar, accounts for 14 per cent of the global output. It is the sixth-largest exporter of sugar, accounting for 2.76 per cent of the global exports.

Spice exports from India are expected to reach US$ 3 billion by 2016–17 due to creative marketing strategies, innovative packaging, strength in quality and strong distribution networks. The spices market in India is valued at ₹ 40,000 crore (US$ 6.16 billion) annually, of which the branded segment accounts for 15 per cent.

The procurement target for rice during marketing season (MS) 2015–16 has been finalised as 30 MT.

100 percent FDI is permissible under automatic route for development of seeds.

Given the importance of the agriculture sector, the Government in its Budget 2015–16, planned several steps for the sustainable development of agriculture. It has already taken steps to address two major factors (soil and water) critical to improve agriculture production.

Steps have been taken to improve soil fertility on a sustainable basis through the soil health card scheme and to support the organic farming scheme 'Paramparagat Krishi Vikas Yojana'. Other steps include improved access to irrigation through 'Pradhanmantri Gram Sinchai Yojana'; enhanced water efficiency through `Per Drop More Crop'; continued support to Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the creation of a unified national agriculture market to boost the incomes of farmers.

The Government of India recognises the importance of microirrigation, watershed development and 'Pradhan Mantri Krishi Sinchai Yojana'. Therefore, it has allocated a sum of ₹ 5,300 crore (US$ 815 million) for it.

Given the correlation between improvement in agriculture and the development of the country, the Government of India adopted several initiatives and programmes to ensure continuous growth.

Some of the recent major government initiatives in the sector are as follows:

- India and Lithuania have agreed to intensify agricultural cooperation, especially in sectors like food and dairy processing.
- Gujarat Government has planned to connect 26 Agricultural Produce Market Committees (APMCs) via electronic market platform, under the National Agriculture Market (NAM) initiative.
- The State Government of Telangana plans to spend Rs 81,000 crore (US$ 12.1 billion) over the next three years to complete ongoing irrigation projects and also undertake two new projects for lifting water from the Godavari and Krishna river.
- The National Dairy Development Board (NDDB) announced 42 dairy projects with a financial outlay of Rs 221 crore (US$ 34.02 million) to boost milk output and increase per animal production of milk.

The 12th Five-Year Plan estimates the foodgrains storage capacity to expand to 35 MT. Also, a 4 per cent growth would help restructure the agriculture sector in India in the next few years.

Biotechnology Industry in India

India is among the top 12 biotech destinations in the World and ranks third in the Asia-Pacific region.

The Indian biotech industry holds about 2 per cent share of the global biotech industry. The Indian biotechnology sector is expected to grow from the current US$ 5-7 billion to US$ 100 billion by 2025, growing at an average rate of 30 per cent.

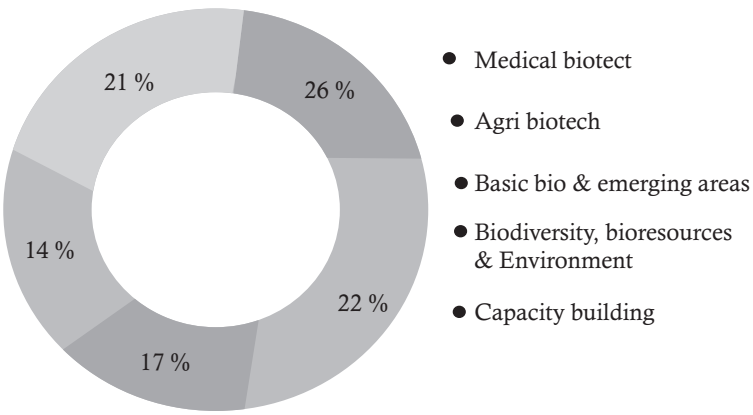
Biopharma is the largest sector contributing about 64 per cent of the total revenue followed by

bioservices (18 per cent), bioagri (14 per cent), bioindustry (3 per cent), and bioinformatics contributing (1 per cent).

The high demand for different biotech products has also opened up scope for the foreign companies to set up base in India. India has emerged as a leading destination for clinical trials, contract research and manufacturing activities owing to the growth in the bioservices sector.

India has all the ingredients to become a global leader in affordable healthcare. If there is an annual investment of US$ 4.01 billion to US$ 5.02 billion in the next five years, the biotech industry can grow to US$ 100 billion by 2025, with a 25 per cent return on investment, and set a growth rate of 30 per cent year-on-year.

12 th Five-Year Plan fund allocation



Soruce : Deptt. Of science and Technology, Planning Commission, Aranca Research

Cement Industry in India

India is the second largest producer of cement in the World. India's cement industry is a vital part of its economy, providing employment to more than a million people, directly or indirectly.

Some of the recent major government initiatives such as development of 100 smart cities are expected to provide a major boost to the sector. Expecting such developments in the country and aided by suitable government foreign policies, several foreign players such as Lafarge-Holcim, Heidelberg Cement, and Vicat have invested in the country in the recent past.

India's cement demand is expected to reach 550-600 million tonnes per annum (MTPA) by 2025. The housing sector is the biggest demand driver of cement, accounting for about 67 per cent of the total consumption in India.

In the 12th Five Year Plan, the Government of India plans to increase investment in infrastructure to the tune of US$ 1 trillion and increase the industry's capacity to 150 MT.

Gems and Jewellery Industry in India

- Contributor to semi-skilled employment. Consists of 3 segments – Diamonds, Gold Jewellery & Coloured Gemstones.

It is extremely export oriented and labour intensive. It contributes to 6 – 7 percent of the GDP.

The gems and jewellery sector in India is engaged in sourcing, manufacturing, and processing, which involves cutting, polishing and selling precious gemstones and metals such as diamonds, other precious stones, gold, silver and platinum.

It contributed US$ 39.9 billion in terms of foreign exchange earnings in FY 2014-15.

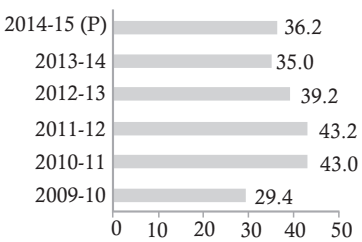
The industry grew 4.3 per cent, with exports worth US$ 36.2 billion in 2014–15.

In 2014–15, export of cut and polished diamonds declined 5.0 per cent to US$ 23.2 billion.

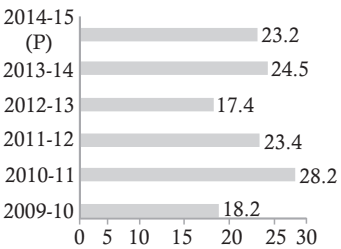
It is expected that gems and jewellery exports could reach US$ 58 billion by 2015.

According to a report by Research and Markets, the Jewellery Market in India is expected to grow at a CAGR of 15.95 per cent over the period 2014-2019.

Gems & Jewellery Exports (US$ Billion)



Cut & Polished Diamond Exports (US$ billion)



Source Gem and Jewellery Export Promotion Council (G.EPC) Notes : P.Provisional

Manufacturing Industry in India

Indian Manufacturing sector currently contributes 16% to GDP (2015) and gives employment to 12% (2014) of the country's workforce. Studies have estimated that every job created in manufacturing has a multiplier effect, creating 2–3 jobs in the services sector.

Prime Minister Mr Narendra Modi, has launched the 'Make in India' initiative to place India on the world map as a manufacturing hub to give global recognition to the Indian economy.

In a major boost to the 'Make in India' initiative, the Government of India has received investment proposals of over US$ 3.05 billion till end of August 2015 from various companies. India has become one of the most attractive destinations for investments in the manufacturing sector.

Clean energy investments in India increased to US$ 7.9 billion in 2014, helping the country maintain its position as the seventh largest clean energy investor in the world.

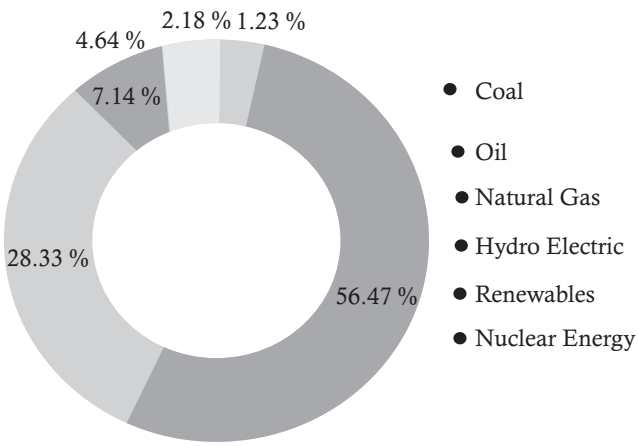
Oil and Gas Industry in India

The oil and gas sector is among the six core industries in India and plays a major role in influencing decision making for all the other important sections of the economy. In 1997–98, the New Exploration Licensing Policy (NELP) was envisaged to fill the ever-increasing gap between India's gas demand and supply. A recent report points out that the Indian oil and gas industry is anticipated to be worth US$ 139.8 billion by 2015.

The Government of India has adopted several policies to fulfil the increasing demand. The government has allowed 100 per cent foreign direct investment (FDI) in many segments of the sector, including natural gas, petroleum products, and refineries, among others.

Presently, domestic production accounts for more than three-quarters of the country's total gas consumption. India increasingly relies on imported LNG. The country was the fifth-largest LNG importer in 2013, accounting for 5.5 per cent of global imports. India's LNG imports are forecasted to increase at a CAGR of 33 per cent during 2012–17. However, net imports of Natural Gas fell from 13.14

Energy Consumption Pattern in 2014



Source: US Energy Information Administration (EIA), BP Statistical Review 2015

State-owned Oil and Natural Gas Corporation (ONGC) dominates the upstream segment (exploration and production), accounting for approximately 68 per cent of the country's total oil output (FY14).

PAHAL - Direct Benefit Transfer for LPG consumer (DBTL) scheme launched in 54 districts on November 11, 2014 and expanded to rest of the country on January 1, 2015 will cover 15.3 crore active LPG consumers of the country. 24 7 LPG service via web launched to provide LPG consumers an integrated solution to carry out all services at one place, through MyLPG.in, from the comfort of their home.

The Government of India launched the 'Give It Up' campaign on LPG subsidy that helped it save ₹ 140 crore (US$ 21.11 million) as on 22nd July 2015 with nearly 12.6 lakh Indians registering for the cause.

Subsidised cooking gas will no longer be provided to consumers earning ₹ 10 lakh or more a year from January 1, 2016. The rule will initially be implemented on self-declaration basis for cylinders booked from January 2016 onwards.

India has proven oil reserves of 5.7 billion barrels, and gas reserves of 1.4 trillion cubic meters, yet given the low production base, the country remains a net importer of energy.

Real Estate Industry in India

India is the second largest employer of Real estate after agriculture and is slated to grow at 30 per cent over the next decade.

The real estate sector comprises four sub sectors - housing, retail, hospitality, and commercial.

Bengaluru is expected to be the most favoured property investment destination for NRIs, followed by Ahmedabad, Pune, Chennai, Goa, Delhi and Dehradun.

The Indian real estate market is expected to touch US$ 180 billion by 2020. The housing sector alone contributes 5-6 per cent to the country's Gross Domestic Product (GDP).

Mumbai is the best city in India for commercial real estate investment, with returns of 12-19 per cent likely in the next five years, followed by Bengaluru and Delhi-National Capital Region (NCR).

Under the Sardar Patel Urban Housing Mission, 30 million houses will be built in India by 2022, mostly for the economically weaker sections and low-income groups, through public-private-partnership (PPP) and interest subsidy.

Textile Industry in India

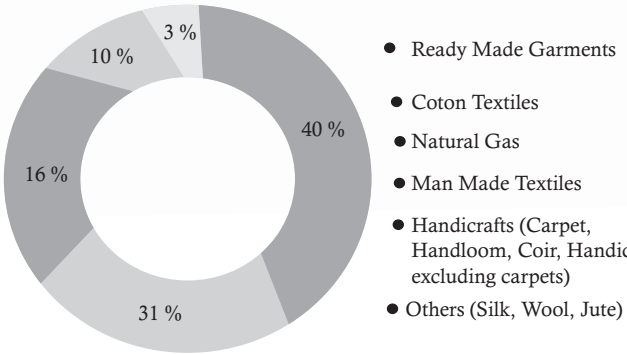
India's textiles sector is one of the oldest industries in Indian economy dating back several centuries. Even today, textiles sector is one of the largest contributors to India's exports. India is the world's second largest exporter of textiles and clothing contributing approximately 11 per cent of total exports. The textiles industry is also labour intensive and is one of the largest employers.

The industry realised export earnings worth US$ 41.4 billion in 2014-15, a growth of 5.4 per cent, as per The Cotton Textiles Export Promotion Council (Texprocil).

The Indian textiles industry, currently estimated at around US$ 108 billion, is expected to reach US$ 223 billion by 2021.

The Indian Textile Industry contributes approximately 5 per cent to India's gross domestic product (GDP), and 14 per cent to overall Index of Industrial Production (IIP). Readymade garments are the largest contributor to total textile and apparel exports from India in FY15. The segment had a share of 40 per cent in overall textile exports. Cotton and handmade textiles were also major contributors with shares of 31 per cent and 16 per cent, respectively.

Share of India's textile exports (Fy15)



Soruce : Ministry of Textiles, Budget 2015, TechSci Research

Foreign direct investment (FDI) in textile sector increased to US$ 1,587.8 million in FY15 from US$ 1,424.9 million in FY14. The Ministry of Textiles is encouraging investments through increasing focus on schemes such as Technology Upgradation Fund Scheme (TUFS).

IT & ITeS Industry in India

India is the world's largest sourcing destination for the information technology (IT) industry, accounting for approximately 67 per cent of the US$ 124-130 billion market.

India's IT industry amounts to 12.3 per cent of the global market, largely due to exports. Export of IT services accounted for 56.12 per cent of total IT exports (including hardware) from India. The Business Process Management (BPM) segment accounted for 23.46 per cent of total IT exports during FY15.

The IT industry has also created significant demand in the Indian education sector, especially for engineering and computer science.

The Indian Information Technology (IT) sector is expected to grow 11 per cent per annum and triple its current annual revenue to reach US$ 350 billion by FY 2025, as per National Association of Software and Services Companies (NASSCOM).

India's internet economy is expected to touch Rs 10 trillion (US$ 151.6 billion) by 2018, accounting for 5 per cent of the country's gross domestic product (GDP), according to a report by the Boston Consulting Group (BCG) and Internet and Mobile Association of India (IAMAI). India's internet user base reached over 350 million by June 2015, the third largest in the world, while the number of social media users grew to 143 million by April 2015 and smartphones grew to 160 million.

Indian start-ups are expected to receive funding worth US$ 5 billion by the end of 2015, a 125 per cent increase in a year, according to a report by IT Industry association NASSCOM.

The Government of India has launched the Digital India program to provide several government services to the people using IT and to integrate the government departments and the people of India. The adoption of key technologies across sectors spurred by the 'Digital India Initiative' could help boost India's gross domestic product

(GDP) by US$ 550 billion to US$ 1 trillion by 2025, as per research firm McKinsey.

SMAC, increasing at a CAGR of approximately 30 per cent to around US$ 650-700 billion by 2020. The social media is the second most lucrative segment for IT firms, offering a US$ 250 billion market opportunity by 2020.

The Indian e-commerce segment is US$ 12 billion in size and is witnessing strong growth and thereby offers another attractive avenue for IT companies to develop products and services to cater to the high growth consumer segment.

Indian Automobile Industry

The Indian automobile industry registered a growth of 8.68 percent in the FY 2014 – 15 over last year and produced 23.37 million vehicles. The automobile industry accounts for 7.1 per cent of the country's gross domestic product (GDP).

Two-wheeler production is projected to rise from 18.5 million in FY15 to 34 million by FY20. Furthermore, passenger vehicle production is expected to increase to 10 million in FY20 from 3.2 million in FY15.

The government aims to develop India as a global manufacturing as well as a research and development (R&D) hub. It has set up National Automotive Testing and R&D Infrastructure Project (NATRIP) centres as well as a National Automotive Board to act as facilitator between the government and the industry.

Alternative fuel has the potential to provide for the country's energy demand in the auto sector as the CNG distribution network in India is expected to rise to 250 cities in 2018 from 125 cities in 2014. Furthermore, the luxury car market can register high growth and is expected to reach 150,000 units by 2020.

Coal Industry in India

Coal is one of the important parts of India's energy mix. India is third-largest producer of coal with a production of 565.6 million tonnes (MT) in FY14. It has the fifth largest coal reserves in the world at 301.6 billion tonnes (BT). It is a major source of electricity production in India.

Coal India Limited (CIL) was formed as a holding company in 1975, incorporating the state-owned companies that were created following the nationalisation of India's coal assets.

Coal India Limited accounts for around 80 per cent of India's total coal production. CIL's production target for the 2015–16 financial year (April 2015 to March 2016) has been set at 550 million tonnes, up 8.5 per cent from the previous year's target. In the previous fiscal year CIL produced 494 million tonnes, 3 per cent below its target of 507 million tonnes (Bahuguna 2015). To achieve the new target, CIL will need to produce an extra 56 million tonnes during the 2015–16 financial year.

Although the central government has primary carriage over India's coal sector, state governments retain some influence over developments through approval of mining licences and leases.

Iron & Steel Industry

Started by TISCO at Jamshedpur in 1907. India is world's 3rd largest producer of crude steel. Provide employment to large number of people. Steel sector contributes nearly 2% of GDP. Key industry for construction. Backbone of all industries. SAIL – largest public sector steel producing company.

Travel & Tourism Industry

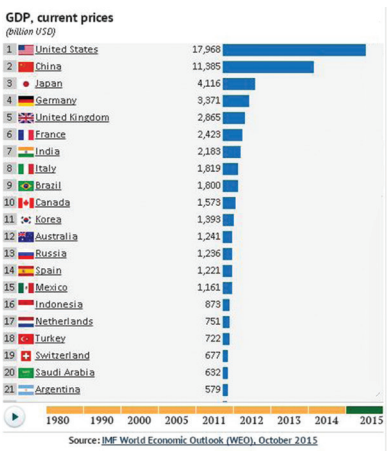
According to world Economic Forum's Travel & Tourism Competitiveness Report 2013, India ranks 11th in the Asia Pacific region and 65th globally out of economies ranked on Travel & Tourism Competitiveness Index. Tourism in India accounts for 6.8% of the GDP & is the 3rd largest foreign exchange earner for the country. The direct contribution of Tourism & Hospitality sector to GDP totalled US $ 44.2 billion in 2015. Over 7.757 million foreign tourist arrivals were reported in 2015. Important Travel Companies in India Cox Kings Ltd., India Tourism Development Corporation Ltd., Thomas Cook Ltd.

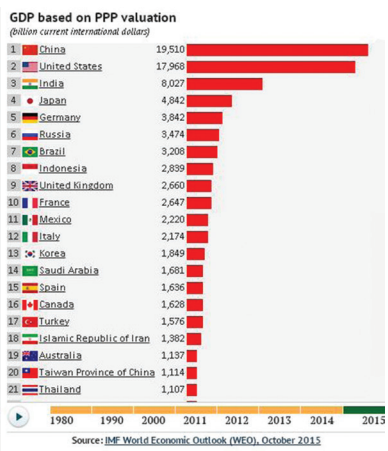
WORLD ECONOMY

By the term world economy, we mean that comprehensive economy which is based on national economies of every country of the world. In other words it is the economy of global community encompassing economies of every local society across the entire globe. The 20th century world witnessed two world wars, the Great Depression of the 1930s, the end of colonial rule, robust scientific and technological developments, the Cold War between the Western alliance and the Warsaw Pact nations, living standards enrichment in North America, Europe, and Japan; increased concerns about environmental degradation, energy conservation, declining biological diversity, etc., the emergence of the US as world superpower, continued population explosion.

As for global economic history, economic growth took place first during the Industrial Revolution in Europe, because of huge energy conversion taking place. Economic growth spread to cover the entire world during the twentieth century and world GDP per capita multiplied by five times. Maximum growth took place in the 1960s the period of post war reconstruction. Trade revolution brought in by container ships after the 1950's, paved way for cheap transportation of goods.

So far as the 21st century is concerned the continued advancement in science and technology has both its inherent merits and demerits- merits in terms of advances in medicine, agriculture beneficial to humankind and propagation of lethal weapons of war, mass destruction harmful for mankind.









BUSINESS

BUSINESS ENTITIES

- **Sole Proprietorship:** It is an unincorporated business with one owner who pays personal income tax on profits from the business.
- **Partnership:** A type of business organisation in which two or more individuals pool money, skills, & other resources, & share profit & loss in accordance with terms of the partnership agreement.
- **Limited Liability Partnership (LLP):** It is a partnership in which some or all partners have limited liabilities.
- **Hindu Undivided family (HUF):** It is an extended family arrangement prevalent throughout the Indian subcontinent consisting of many generations living in the same household, all bound by the common relationship. A huf is a legal term related to the Hindu Marriage Act. The female members are also given the right of share to the property in the HUF.
- **Cooperative:** It is a firm owned, controlled, & operated by a group of users for their own benefit. Each member contributes equity capital, & shares in the control of the firm on the basis of one-member, one-vote principle.
- **Dormant Company:** The Companies Act 2013 (section 455) introduces a concept of a dormant company withein its ambet. The Dormant Company is a company formed & registered under this act for a future project or to hold an asset or intellectual property & has no significant accounting transaction, such a company or an inactive company may make an application to the registrar in such manner as may be prescribed for obtaining the status of a Dormant company.
- **Family Owned Business:** It is a kind of business in which two or more family members are involved & the majority of ownership or control lies within a family.
- **Private Limited Company:** A type of company that offers limited liability, or legal protection for its shareholders but that places certain restrictions on its ownership.
- **Small Company:** It is a company that satisfies either of the following conditions:

  (i) Paid-up share capital which does not exceed 50 lakh rupees or such higher amount as may be prescribed which shall not be more than 5 crore rupees.

  OR

  (ii) Turnover of which as per its last profit & loss account does not exceed 2 crore rupees or such higher amount as may be prescribed which shall not be more than 20 crore rupees.
- **Public Limited Company:** A company whose securities are traded on a stock exchange & can be bought & sold by anyone. Its formation, working & its winding up, in fact, all its activities are strictly governed by laws, rules & regulations.
- **Public Sector Unit (PSU):** The government owned corporations are termed as public sector undertakings (PSUs) in India. In a PSU majority (51% or more) of the paid up share capital is held by Central Government or by any state government & partly by one or more state governments.

- **One Person Company:** It is a registered company who has only one shareholder. It is a private company.
- **Unlimited Company:** It is a company in which all members or shareholders have total & joint responsibility to cover all debts & other liabilities the company generates, regardless of how much capital each contributes.
- **Incorporated Company:** A company that has been granted a charter legally recognizing it as a separate entity having its own privileges, rights, & liabilities distinct from other business & persons.

CORPORATE GOVERNANCE

The framework of rules & practices by which a Board of Directors ensures accountability, fairness, & transparency in a company's relationship with its all stakeholders (financiers, customers, management, employees, government, & the community).

The corporate governance framework consists of

1. explicit & implicit contracts between the company & the stakeholders for distribution of responsibilities, rights & rewards.
2. procedures for reconciling the sometimes conflicting interests of stakeholders in accordance with their duties, privileges & roles.
3. procedures for proper supervision, control & information-flows to serve as a system of checks & balances.

COMPANY ACT 2013

Companies Act, 2013 is an act which regulates incorporation of a company, responsibilities of a company, directors, dissolution of a company.

The Act has replaced The Companies Act, 1956 (in a partial manner) after receiving the assent of the President of India on 29 August 2013.

Brief description of new concepts introduced in Companies Act 2013

- **One Person Company** is a company with only one person as a member. That one person will be the shareholder of the company. It avails all the benefits of a private limited company such as separate legal entity, protecting personal assets from business liability, and perpetual succession.
- **Woman Director:** Every Listed Company /Public Company with paid up capital of ₹100 Crores or more/Public Company with turnover of ₹300 Crores or more shall have at least one Woman Director.
- **Corporate Social Responsibility:** Every company having net worth of rupees five hundred crore or more, or turnover of rupees one thousand crore or more or a net profit of rupees five crore or more during any financial year shall constitute a Corporate Social Responsibility Committee of the Board consisting of three or more directors, out of which at least one director shall be an independent director.'

- **Registered Valuers :** Where a valuation is required to be made in respect of any property, stocks, shares, debentures, securities or goodwill or any other assets (herein referred to as the assets) or net worth of a company or its liabilities under the provision of this Act, it shall be valued by a person having such qualifications and experience and registered as a valuer in such manner, on such terms and conditions as may be prescribed and appointed by the audit committee or in its absence by the Board of Directors of that company.
- A Class Action Suit refers to a law suit that allows a large number of people with a common interest in a matter to sue or be sued as a group. It is a procedural device enabling one or more plantiffs to file and prosecute a litigation on behalf of a larger group or class, wherein such class has common rights and grievances.
- **Fast Track Merger :** Under fast track merger processes Central Government has the power to sanction all such scheme and there will be no requirement to approach National Company Law Tribunal (powers presently exercised by the High Court).

New Pension System

Pension Plans provide financial security & stability during old age when people don't have a regular source of income. To provide social security to more citizens the government of India has started the National Pension System. Government of India established Pension Fund Regulatory & Development Authority (PFRDA) on 10th October 2013 to develop & regulate pension sector in the country. The National Pension System (NPS) was launched in 1st January, 2004 with the objective of providing retirement income to all the citizens. With effect from 1st may 2009, NPS has been provided for all citizens of the country including the unorganised sector workers on voluntary basis. Additionally, Central Government launched a co-contributory pension scheme, **'Swavalamban Scheme'** in the Union Budget of 2010-11, under which the government will contribute a sum of ₹ 1,000 to each eligible NPS subscriber who contributes a minimum of ₹ 1,000 & maximum ₹ 12,000 per annum.

The NPS is structured in 2 tiers. A Tier-1 account is a basic retirement pension account available to all citizens from 1 May 2009. It doesnot permit withdrawal of funds before retirement. A Tier-2 account is a prospective payment system account that permits some withdrawal of pension prior to retirement under exceptional circumstances, usually related to the provision of health care.

MINISTRY OF CORPORATE AFFAIRS

MCA regulates corporate affairs in India through the Companies ACT, 1956, 2013 and other allied Acts, Bills and Rules. MCA also protects investors and offers many important services to stakeholders.

The Ministry is also responsible for administering the Competition Act, 20002 to prevent practices having adverse effect on competition, to promote and sustain competition in markets, to protect the interests of consumers through the commission set up under the Act.

Besides, it exercises supervision over the three professional bodies, namely, Institute of Chartered Accountants of India (ICAI) which are constituted under three separate Acts of the Parliament for proper and orderly growth of the professions concerned

Registrar of Companies

Registrars of Companies (ROC) appointed under Section 609 of the Companies Act covering the varuous States and Union Territories are vested with the primary duty of registering companies and LLPs floated in the respective states and the Union Territories and ensuring that such companies and LLPs comply with statutory requirements under the Act. These offices function as registry of records relating to the companies registered with them, which are available for inspection by members of public on payment of the prescribed fee. The Central Government exercises administrative control over these offices through the respective Regional Directors.

Income Tax Department

The **Income Tax Department**, also referred to as **IT Department**, is a government agency in charge of monitoring the income tax collection by the Government of India. It functions under the Department of Revenue of the Ministry of Finance. It is responsible for administering following direct taxation acts passed by Parliament of India.

- Income Tax Act
- Wealth Tax Act
- Gift Tax Act
- Expenditure Tax Act
- Interest Tax Act
- Various Finance Acts (Passed Every Year in Budget Session)

The IT Department is also responsible for enforcing the Double Taxation Avoidance Agreements and deals with various aspects of international taxation such as Transfer Pricing.

BALANCE SHEET

A financial statement that summarizes a company's assets, liabilities and shareholders' equity at a specific point in time. These three balance sheet segments give investors an idea as to what the company owns and owes, as well as the amount invested by shareholders.

The balance sheet adheres to the following formula:
Assets = Liabilities + Shareholders' Equity

Balance Sheet Template

Company Name Here
Balance Sheet
For the Period Ended _____

Assets				Liabilities			
Current Assets				**Current Liabilities**			
Cash		XXXXXX		Accounts Payable		XXXXXX	
Short-term Investments		XXXXX		Salaries Payable		XXXXX	
Accounts Receivables		XXXXX		Accrued Interest		XXXXX	
Inventories		XXXXXXX		Taxes Payable		XXXX	
Prepaid Insurance		XXXXXX		Current Portion of Notes		XXXXXX	XXXXXXXX
Others		XXXXX	XXXXXX				
Long Term Investments				**Long Term Liabilities**			
Stock Investments		XXXXXX		Note Payable		XXXXXX	
Cash Value of Insurance		XXXXXXX	XXXXXX	Mortgage Liability		XXXXXX	XXXXXXXX
Fixed Assets							
Land		XXXXXX					
Building and Equipment	XXXXXXX			**Total Liabilities**			XXXXXXXX
Less Accumulated Depreciation	(XXXXX)	XXXXXX	XXXXXXX				
Intangible Assets				**Stock Holder's Equity**			
Good Will			XXXXXXX	Capital Stock		XXXXXXXX	
				Retained Earnings		XXXXXXX	
Other Assets				**Total Stock Holder's Equity**			XXXXXX
Receivables from Employees			XXXXXXXX				
Total Assets			XXXXXXXXX	**Total Liabilities**			XXXXXXXXX

SOURCES OF FUNDS

Debt : A duty or obligation to pay money delivery goods or render service under an express or implied agreement.

Debentures : It is a medium- to long-term debt instrument used by large companies to borrow money, at a fixed rate of interest.

Shareholder's Equity : It represents the amount by which a company is financed through common and preferred shares.

Seed Funding : It is a type of securities contribution in which and investor invests capital in exchange for an equity stake in the company. This sort of funding is done in the initial stages of a business.

Venture funding : It is the capital invested, or available for investment, in an enterprise that offers the probability of profit along with the possibility of loss. This sort of funding is done, generally, after a company has a proof of concept and has crossed early stages of business.

IPO : Initial public offering of IPO is the first sale of a company's shares to the public, leading to a stock market listing. A lot of venture funds adopts this route to exit a company in which they have invested.

Shares : A unit of ownership that represents an equal proportion of a company's capital. It entitles its holder(the shareholder) to an equal claim on the company's profits & an equal obligation for the company's debts & losses.

There are 2 major types of shares-

- **Ordinary shares :** entitle the shareholder to share in the earnings of the company & to vote at the company's annual general meatings & other official meetings.

- **Preference shares :** entitle the shareholder to a fixed periodic income but generally donot give him/her voting rights.

Loans : A loan is a debt pronded by entity (organisation of individual) to another entity at an interest rate.

PERFORMANCE OF A COMPANY

Debt/Equity ratio : It is a debt ratio used to calculate company's financial leverage. It is calculated by dividing a company's total liabilities by its stockholder's equity. It shows how much debt a corporation is using to fund its assets relative to the amount of value represented in shareholder's equity.

P/E ratio : The price-to earnings ratio is an equity valuation multiple. It is defined as market price per share divided by annual earnings per share, (EPS = total income of company divided by number of shares issued)

Turnover ratio : The turnover ratio measures how well a company is utilizing its capital to support a given Level of Sales. A high turnover ratio indicates that management is being extremely efficient is using a firm's short term assets & liabilities to support sales. Conversely, a low ratio indicates that a business is investing in too many accounts receivable & inventory assets to support its sales, which could eventually lead to an excessive amount of bad debts & obsolete inventory

SMALL AND MEDIUM-SIZED ENTERPRISES

Small and medium-sized enterprises (SMEs; sometimes also small and medium enterprises) or small and medium-sized businesses (SMBs) are businesses whose personnel numbers fall below certain limits. Indian Small and Medium Enterprises (SME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last five decades. SMEs not only play crucial role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in industrialization of rural areas. SMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socio-economic development of the country. The sector consisting of 36 million units, as of today, provides employment to over 80 million persons. The Sector through more than 6,000 products contributes about 8% to GDP besides 45% to the total manufacturing output and 40% to the exports from the country. The SME sector has the potential to spread industrial growth across the country and can be a major partner in the process of inclusive growth.

SMEs also play a significant role in Nation development through high contribution to Domestic Production, Significant Export Earning, Low Investment Requirements, Operational Flexibility, Location Wise Mobility, Low Intensive Imports, Capacities to Develop Appropriate Indigenous Technology, Import Substitution, Contribution towards Defence Production, Technology – Oriented Industries, Competitiveness in Domestic and Export Markets thereby generating new entrepreneurs by providing knowledge and training.

E–COMMERCE IN INDIA

E-commerce or electronic commerce deals with the buying & selling of goods & services, or the transmitting of funds or data, over an electronic platform, mainly the internet. These business transactions are categorised into–

- Business to Business (B2B)
- Business to Consumers (B2C)
- Consumer to Consumer (C2B)
- Consumer to Business(C2C)

Business to Business to Consumer

E–commerce processes are conducted using applications, such as Email, fax, online catalogues & shopping carts, electronic data interchange, file transfer protocol & web services & e–newsletters to subscribers. E–Travel is the most popular form of E–commerce, followed by e–Tail which essentially means selling of retail goods on the internet conducted by the B2C category.

As of Q1 2015, six Indian E-commerce companies have managed to achieve billion–dollar valuations, namely Flipkart, Snapdeal, Inmobi, Quikr, Ola cabs & Paytm.

Mobile Commerce (M – Commerce)

M–Commerce is the buying & selling of goods & services through wireless handheld services such as cellular telephone & personal digital assistants. The phrase mobile commerce was originally coined in 1997 by Kevin Duffey at the launch of the Global Mobile Commerce Forum. Mobile Commerce transaction continues to grow, & the term includes online banking, Bill payment & so on.

'MNC'

A corporation that has its facilities and other assets in at least one country other than its home country. Such companies have offices and/or factories in different countries and usually have a centralized head office where they co-ordinate global management. It can also be referred as an international corporation, a "transnational corporation", or a stateless corporation.

NGO

A non-governmental organization (NGO) is an organization that is neither a part of a government nor a conventional for-profit business.

The term "non-governmental organization" was first coined in 1945, when the United Nations (UN) was created.The UN, itself an inter-governmental organization, made it possible for certain approved specialized international non-state agencies — i.e., non-governmental organizations — to be awarded observer status at its assemblies and some of its meetings. Later the term became used more widely. Today, according to the UN, any kind of private organization that is independent from government control can be termed an "NGO", provided it is not-for-profit, nonprevention, and not simply an opposition political party.

Examples include improving the state of the natural environment, encouraging the observance of human rights, improving the welfare of the disadvantaged, or representing a corporate agenda. However, there are a huge number of such organizations and their goals cover a broad range of political and philosophical positions. This can also easily be applied to private schools and athletic organizations.

FICCI (Federation of Indian Chamber of Commerce & Industry)

Established in 1927, FICCI is the largest and oldest apex business organisation in India. A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry.

AGMARK

It is a certification mark employed on agricultural products in India, assuring that they confirm to a set of standards approved by the Directorate of Marketing & Inspection, an agency of the Government of India.

ISI Mark

ISI (Indian Standards Institute) mark is a certification mark for industrial products in India. The mark certifies that a product confirms to the Indian Standard, mentioned as IS: xxxx on top of the mark, developed by the Bureau of Indian Standards (BIS). The ISI mark is mandatory for certifying products to be sold in India, like many of the electrical appliances, kitchen appliances, other products like LPG valves, LPG cylinders, automotive tyres, etc.

IMPORTANT BUSINESS TERMS

Term	Meaning
Ahead of the Curve	To be more advanced than the competition
Backroom Deal	An agreement or decision that is made without the public knowing about it.
Go broke	To go bankrupt or to loose all the money a person or business had.
In the black	If a company is "in the black", it means that they are making a profit
In the red	If a company is "in the red" it means that they are not profitable & are operating at a loss.
Lose – Lose situation	When someone has to choose between various options & all the options are bad.
Pink Slip	If someone gets the "pink slip", it means they have fired.
Snail Mail	Letter or messages that are not sent by email, but by regular post.
Blue Collar Worker	Someone who works with his/her hands (manufacturing construction, maintenance, etc.).
White Collar Worker	Someone who works in an office (customer service, management, sales, etc.)
Win – Win situation	A situation where everyone involved gains something.
Corner a market	To dominate a particular market.
Downsizing	A planned reduction in the number of employees needed in a firm in order to reduce costs & make the business more efficient.
Venture Capital	money that is invested in new or emerging companies that are perceived as having great profit potential.

Term	Meaning
Opportunity Cost	Cost in terms of foregone alternatives.
Logistics	Process of strategically managing the efficient flow & storage of raw materials, in-process inventory, & finished goods from point of origin to point of consumption.
Equity	Difference between market value of a property & claims held against it.
Merger	Combination of two or more companies into a single firm.
Acquisition	Taking over the control of one company by another.
Hedging	A Risk management Strategy used in limiting or offsetting probability of loss from fluctuations in the prices of commodities, currencies, or securities.
Intellectual Property	Knowledge, creative ideas, or expressions of human mind that have commercial value & are protectable under copyright, patent, servicemark, trademark, or trade secret laws from imitation infringement, & dilution.
Swap	Exchange of one type of asset, cash flow, investment, liability, or payment for another.
Bankrupt	When individual/company cannot pay their debts & are not able to reach an agreement with their creditors.
Liquidity	How quickly assets can be converted into cash.

BUSINESS CONCEPTS

Agent : A business entity that negotiates, purchases, and/or sells, but does not take title to the goods.

Doing Business As (DBA) – DBA stands for "Doing Business As," which is a company name, also commonly called a "Fictitious business name." When a sole proprietor operates a company using any name except his or her own given name, then the DBA or ficticious business name registration establishes the legal ownership to satisfy banks, local authorities, and customers.

Ideas vs opportunities – Ideas are the basis of potential business opportunities. Good ideas do not necessarily represent good opportunities.

Initial Public Offering (IPO) – A corporation's initial efforts of raising capital through the sale of securities on the public stock market.

Inventory – Goods in stock, either finished goods or materials to be used to manufacture goods.

Outsourcing – Purchasing an item or a service from an outside vendor to replace performance of the task with an organization's internal operations.

SWOT analysis – A formal framework of identifying and framing organizational growth opportunities. SWOT is an acronym for an organization's internal Strengths and Weaknesses and external Opportunities and Threats.

CRM- C-R-M stands for Customer Relationship Management. At its simplest, a CRM system allows businesses to manage business relationships and the data and information associated with them.

Supply Chain Management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to

retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies.

Memorandum of Association (MoA) :

MoA is a legal document prepared in the formation & registration process of a limited liability company to define its relationship with shareholders.

Articles of Association : It is a document of a company which defines the responsibilities of the directors, the kind of business to be undertaken, & the means by which the shareholders exert control over the board of directors.

Start – ups

A start-up company is an entrepreneurial venture or a new business in the form of a company, a partnership or temporary organization designed to search for a repeatable and scalable business model. These companies, generally newly created, are innovative in a process of development, validation and research for target markets.

Boot Strap

A situation in which an entrepreneur starts a company with little capital. An individual is said to be boot strapping when he or she attempts to found and build a company from personal finances or from the operating revenues of the new company.

- **Employees' State Insurance (ESI)**
  ESI is a self-financing social security & health insurance scheme for Indian workers. The ESI is managed by the ESI Corporation (ESIC) according to rules and regulations stipulated there in the ESI Act 1948, which oversees the provision of medical and cash benefits to the employees and their family through its large network of branch offices, dispensaries and hospitals throughout India.
- **Provident Fund (PF)**
  It is a fund which is composed of contributions & made by the employee during the time he/she worked along with an equal contribution by his employer. Its purpose is to help employees save a fraction of their salary every month, to be used in an event that the employee is temporarily or no longer fit to work or at retirement.

TDS

Tax deducted at source (TDS), as the very name implies aims at collection of revenue at the very source of income. It is essentially an indirect method of collecting tax which combines the concepts of "pay as you earn" and "collect as it is being earned." Its significance to the government lies in the fact that it prepones the collection of tax, ensures a regular source of revenue, provides for a greater reach and wider base for tax. At the same time, to the tax payer, it distributes the incidence of tax and provides for a simple and convenient mode of payment.

The concept of TDS requires that the person on whom responsibility has been cast, is to deduct tax at the appropriate rates, from payments of specific nature which are being made to a specified recipient. The deducted sum is required to be deposited to the

credit of the Central Government. The recipient from whose income tax has been deducted at source, gets the credit of the amount deducted in his personal assessment on the basis of the certificate issued by the deductor.

'Lease '

A legal document outlining the terms under which one party agrees to rent property from another party. A lease guarantees the lessee (the renter) use of an asset and guarantees the lessor (the property owner) regular payments from the lessee for a specified number of months or years. Both the lessee and the lessor must uphold the terms of the contract for the lease to remain valid.

Financial Leasing

As one of the most popular financing tools in modern business world, Financial Leasing Services uses finance leases to leverage assets. A Finance Lease (or Capital Lease) is a lease that is primarily a method of raising finance to pay for assets, rather than a genuine rental.

It is a commercial arrangement where:

- the leases (customer or borrower) will select an asset (equipment, vehicle, software);
- the lessor (finance company) will purchase that asset;
- the leassee will have use of that asset during the lease;
- the lessess will pay a series of rental or installments for the use of that asset;
- the lessor will recover a large part or all of the cost of the asset plus earn interest from the rentals paid by the lessee;
- the lessee has the option to acquire ownership of the asset (e.g. paying the last rental, or bargain option purchase price);

The finance company is the legal owner of the asset during duration of the lease.

E-FILING

Electronic tax filing, or e-filing, is a system for submitting tax documents to a revenue service electronically, often without the need to submit any paper documents. E-filing has manifold benefits; the taxpayer can file a tax return from the comfort of home, at any convenient time, once the tax agency begins accepting returns. E-filing saves the tax agency time and money, because the tax data is transmitted directly into its computers, significantly reducing the possibility of keying and input errors.

Corporate tax

Corporate taxes are taxes against profits earned by businesses during a given taxable period. Corporation tax is a tax imposed on the net income of the company. The present corporate for is 30% on the Net Income of the company.

It was announced in Union Budget 2015 that corporate tax rate will be gradually reduced from 30% to 25% over the period of 4 years, starting in April 2016. 2% surcharge was introduced on earnings above 10 crores.

Surcharge is applied in the following cases:

- If the company has a total income less than Rs. 1 crore, then it does not have to pay any income tax.
- If the net income of the company for that year is in the range of Rs.
- 10 crore then 5% surcharge is

applied on its net income.
- If the net income of the company for that year exceeds Rs. 10 crore then 10% surcharge is applied on its net income education cess

Profitability of company

Profitability is the ability of a business to earn a profit. A profit is what is left of the revenue a business generates after it pays all expenses directly related to the generation of the revenue, such as producing a product, and other expenses related to the conduct of the business activities.

Dividend

A share of the after-tax profit of a company, distributed to its shareholders according to the number and class of shares held by them. Start-ups and other high-growth companies such as those in the technology or biotechnology sectors rarely offer dividends because all of their profits are reinvested to help sustain higher-than-average growth and expansion. Larger, established companies tend to issue regular dividends as they seek to maximize shareholder wealth in ways aside from supernormal growth.

Issued Capital

The share capital that has been issued to the shareholders. This is part of a company's authorised capital.

Paid up capital

The amount of a company's capital that has been funded by shareholders. Paid-up capital can be less than a company's total capital because a company may not issue all of the shares that it has been authorized to sell. Paid-up capital can also reflect how a company depends on equity financing.

TOP INFORMATION TECHNOLOGY BRANDS IN INDIA, 2014-15

Rank	Company	Revenues (₹ Cr)
1	TCS	94,648
2	Cognizant Technology Solutions	65,779
3	Infosys Technologies	53,319
4	Wipro	47,318
5	Hewlett-Packard India	37,985
6	HCL Technologies	35,709
7	Tech Mahindra	22,621
8	IBM India	20,442
9	Ingram Micro India	15,823
10	Redington India	14,610
11	Dell India	13,984
12	Oracle India	12,440
13	SAP India	9,896
14	Cisco Systems India	9,740
15	Microsoft India	8,624
16	IGATE	7,879
17	APC by Schneider Electric India	6,848
18	Capgemini India	6,305
19	Intel India	6,292
20	HCL Infosystems	6,270

Source: NASSCOM

LIST OF TOP 10 RICHEST PERSON OF INDIA (AS ON 21ST JULY, 2015), SOURCE: FORBES

S. No.	Name	Net worth (USD)	Company
01	Mukesh Ambani	$19.9	Reliance Industries
02	Dilip Shanghvi	$18.0	Sun Pharma
03	Azim Premji	$15.9	Wipro
04	Hinduja brothers	$14.8	Hinduja Group
05	Pallonji Mistry	$14.7	Shapoorji Pallonji Group
06	Shiv Nadar	$14.7	HCL Technologies
07	Godrej family	$11.4	Godrej Group
08	Lakshmi Mittal	$11.2	ArcelorMittal
09	Cyrus Poonawalla	$7.9	Serum Institute of India
10	Kumar Birla	$7.8	Aditya Birla Group

WORLD'S MOST VALUABLE BRANDS

Rank	Brand	Industry
01	Apple	Technology
02	Microsoft	Technology
03	Google	Technology
04	Coca-cola	Beverages
05	IBM	Technology
06	Mc Donald's	Restaurants
07	Samsung	Technology
08	Toyata	Automotive
09	General Electric	Diversified
10	Facebook	Technology

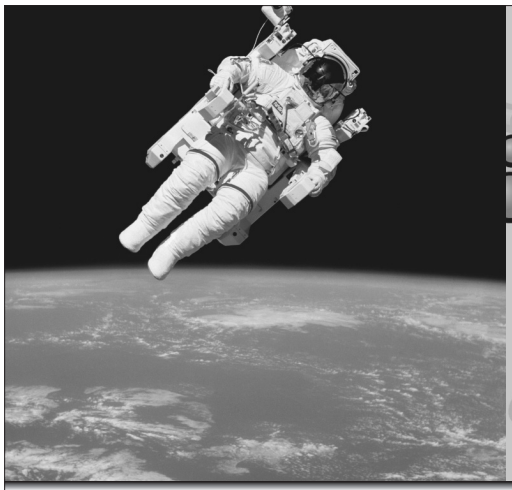
TOP 10 BRANDS OF BRANDZ 2015 REPORT

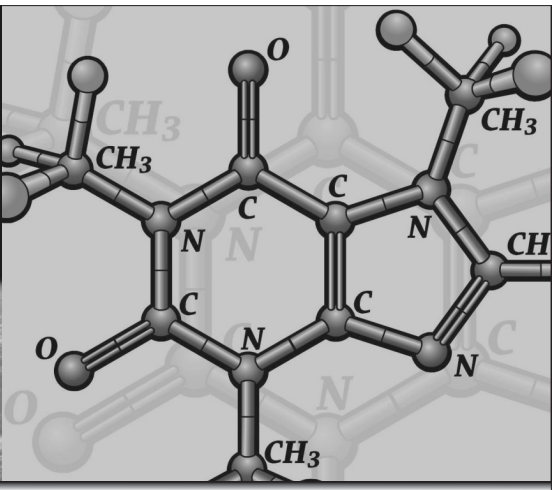
Rank 2015	Brand	Category	Brand Value 2015 (SM)
1	HDFC Bank	Bank	12,577
2	Airtel	Telecoms	11,039
3	SBI	Banks	9,374
4	ICICI Bank	Banks	5,122
5	Asian Paints	Paints	3,867
6	Bajaj Auto	Automobiles	3,345
7	Hero MotoCorp	Automobiles	2,907
8	Axis Bank	Banks	2,494
9	Kotak Mahindra Bank	Banks	2,394
10	Maruti Suzuki	Automobiles	2,318

MAJOR E-COMMERCE ACQUISITIONS IN 2015

1	wehive by flipkart.com
2	babyoye... by Mahindra Retail
3	Taxi for sure by OLA
4	AdiQuity by flipkart.com

5	unicommerce by snapdeal.com
6	martmobi by snapdeal.com
7	app ITERATE by flipkart.com
8	car sale by CARTRADE







GENERAL SCIENCE

- Physics
- Chemistry
- Life Science
- Everyday Science

Physics

MECHANICS

Physical Quantities

Those quantities which can describe the laws of physics and possible to measure are called physical quantities.

The physical quantities which do not depend upon other physical quantities are called ***fundamental quantities.***

In Standard International (**S.I.**) system the fundamental quantities are mass, length, time, temperature, luminous intensity, electric current and amount of substance.

The physical quantities which depend on fundamental quantities are called ***derived quantities*** *e.g. speed, acceleration, force, etc.*

Units

The unit of a physical quantity is the reference standard used to measure it.

1. **Fundamental Units:** The units defined for the fundamental quantities are called fundamental or base units.
   Fundamental Unit for Mass-Kilogram (Kg), Length-metre (m), Time-second(s), Temperature-kelvin (K), Electric Current-ampere (A), Luminous intensity - Candela (cd), Amount of Substance - mole (mol).
2. **Derived Units:** The units defined for the derived quantities are called derived units. e.g. unit of speed or velocity (metre per second), acceleration (metre per second^2) etc.

Some Important Conversions

(i) 1 yard = 0.9144 m ≅ 0.91m
(ii) 1 foot (1') = 0.305 m
(iii) 1 inch (1") = 2.54 cm = 0.025 m
(iv) 1 mile - 1609 m = 1.609 km
(v) 1 ltr. = 1000 cc = 10^{-3} m^3
(vi) 1 cm^2 = 10^{-4} m^2
(vii) 1 mm = 10^{-3} m
(viii) 1 atomic mass unit 1 (amu) = 1.67×10^{-27}
(ix) 1 slug = 14.57 kg
(x) 1 tonne = 10 quintal = 1000kg
(xi) 1 kg/m^3 = 1000 g/cm^3
(xii) 1 km/h = $\frac{5}{18}$ m/s and 1 m/s = $\frac{18}{5}$ km/h
(xiii) 1 newton = 10^5 dyne, 1 kg wt = 9.8 N and 1 g wt = 981 dyne
(xiv) 1 joule = 10^7 erg,
1 eV = 1.6×10^{-19} J
(xv) 1 atm = 76 cm of Hg = $1.01 \times 105 \frac{N}{m^2} = 1.01 \times \frac{dy}{cm^2}$
(xvi) 1 h.p. = 746 watt
(xvii) 1 kw h = 3.6×10^6 J
(xviii) 1 tesla = 1 web/m^2 = 10^4 gauss

Path Length or Distance: The length of the actual path between initial and final positions of a particle in a given interval of time is called distance covered by the particle.

Displacement: The shortest distance from the initial position to the final position of the particle is called displacement.

Speed, Velocity and Acceleration

$$\text{Speed} = \frac{Distance\ travelled}{Time\ Taken}$$

$$Velocity = \frac{Displacement}{Time\ interval}$$

$$Acceleration = \frac{Change\ in\ velocity}{Time\ interval}$$

Kinematic Equations for Uniformly Accelerated Motion

Motion under uniform acceleration is described by the following equations.

$v = u + at$; $s = ut + \frac{1}{2}at^2$ and $v^2 = u^2 + 2as$

Distance Travelled in n^{th} Second of Uniformly Accelerated Motion

$$S_{n^{th}} = u + \frac{a}{2}(2n-1)$$

Relative Velocity: If $\vec{v}_A$ and $\vec{v}_B$ be the respective velocities of object A and B then relative velocity of A w.r.t. B is $\vec{v}_{AB} = \vec{v}_A - \vec{v}_B$

Similarly, relative velocity of B w.r.t. A is $\vec{v}_{BA} = \vec{v}_B - \vec{v}_A$

Scalars and Vectors

The physical quantities which require only magnitude to express, are called ***scalar quantities****.* **Ex.** Mass, distance, time, speed, volume, density, pressure, work, energy, power, charge, electric current, temperature, potential, specific heat, frequency, etc. Certain *physicsl quantities have both magnitude and direction, they are called vector quantities.* **Ex.** Displacement, velocity, acceleration, force, momentum, impulse, electric field, magnetic field, current density, etc.

Newton's Laws of Motion

1st law: *Every body continues to be in its state of rest or of uniform motion in a straight line unless compelled by an external force to change its state.* This fundamental property of the body is called **inertia**. This law is known as Newton's first law of motion or law of inertia.

Inertia: *Inertia is the property of a body due to which it opposes the change in its state.* Inertia of a body is measured by mass of the body. It is directly proportional to the mass of the body i.e., Inertia $\propto$ mass.

Momentum: The linear momentum of a body ($\vec{p}$) is defined as the product of the mass of the body (m) and its velocity. i.e., $\vec{P} = m\vec{v}$.

Relation between momentum and kinetic energy:

Consider a body of mass m moving with velocity v. Linear momentum of the body, $p = mv$.

KE of a particle can be expressed as

$$E = \frac{P^2}{2m} \text{ and } p = \sqrt{2mE}$$

2nd law: *The rate of change of momentum of a body is directly proportional to the unbalanced external force applied on it.*

i.e., $\vec{F} \propto \frac{\vec{dp}}{dt}$ or, $\vec{F} = k\frac{\vec{dp}}{dt}$ or $\vec{F} = m\vec{a}$

Impulse: If a large force acts on a body or particle for a smaller time, then impulse = product of force and time.

$$Impulse = \vec{F}\Delta t$$

3rd law: According to this law, every action has equal and opposite reaction. Action and reaction act on two different bodies and they are simultaneous. There can be no reaction without action.

Law of Conservation of Linear Momentum

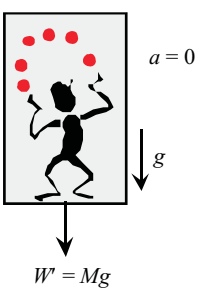
If the total external force acting on a system is equal to zero, then the final value of the total momentum of the system is equal to the initial value of the total momentum of the system.

$$\vec{p} = \text{constant or } \vec{p}f = \vec{p}i$$

Motion in a Lift

Let a man of weight $W = Mg$ be standing in a lift.

Case (a): If the lift is moving with constant velocity v upwards or downwards.



In this case there is no accelerated motion hence no pseudo force experienced by observer 'O' inside the lift.

So apparent weight, W' = actual weight W

Case (b): If the lift is accelerated i.e., a = constant and in upward direction.

Then net forces acting on the man are

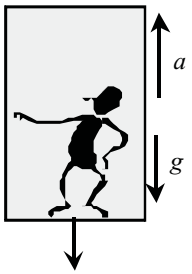
(i) weight W = Mg downward

(ii) fictitious force F_0 = Ma downward.

So apparent weight,

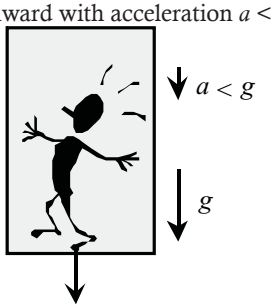
$W' = W + F_0 = Mg + Ma$

$= M(g + a)$



$W' = M(g+a)$

Case (c): If the lift is accelerated downward with acceleration $a < g$:



$W' = M(g - a)$

The fictitious force $F_0 = Ma$ acts upward while weight of a man $W = Mg$ always acts downward, therefore apparent weight, $W' = W + F_0 = Mg - Ma = M(g - a)$

Friction

Whenever a body moves or tends to move over the surface of another body, a force comes into play which acts parallel to the surface of contact and opposes the relative motion. This opposing force is called friction.

Centripetal force: The force directed towards the centre required for traversing a circular path is called centripetal force.

Centripetal force = $F = \frac{mv^2}{r} = m\omega^2 r$.

- In a banked path with curvature (q) with friction, the safe velocity is given by
  $v = \sqrt{[rg(\tan\theta + \mu) / (1 - \mu\tan\theta)]}$.
- **Bending of cyclist:** In order to take a circular turn of radius *r* with speed *v*, the cyclist should bend himself through an angle q from the vertical such that

$$\tan\theta = \frac{v^2}{rg}$$

Work: *Work done by a force on a body is defined as the product of force and the displacement of the body in the direction of force.* SI unit of work is joule.

$W = \vec{F}.\vec{S} = FS\cos\theta$ where θ is the angle between $\vec{F}$ and $\vec{S}$.

Power: ***Power is the rate of doing work.***

$$\text{Power} = P = \frac{dW}{dt} = \frac{\vec{F}.d\vec{S}}{dt} = \vec{F}.\vec{v}$$

Its SI unit is watt.

1 Horse power [1HP] = 746 W,
1 calorie = 4.2J and
1 kW h = 3.6×10^6 J

Energy

Energy is the capacity of doing work. It is also a scalar quantity. The SI unit is joule.

Work-energy theorem states that the work done on a body is equal to the change in its kinetic energy.

Kinetic energy: K.E. is the energy possessed by the body due to its motion.

$$\text{K.E.} = \frac{1}{2}mv^2$$

Potential energy: P.E. is the energy possessed by the body due to its position or shape.

Gravitational P.E. = mgh (due to change in position)

Law of conservation of energy states that energy can neither be created nor be destroyed but it can be transformed from one form to another.

Mass-energy equivalence: According to this theorem mass and energy are inter-convertible.

$$E = mc^2.$$

where $c = 3 \times 10^8$ ms^{-1} is velocity of light in vaccum or air.

Collision

If the path of a body is affected by another body when two bodies physically come in contact, then collision is said to have taken place.

Elastic collision: Both momentum and K.E. are conserved.

For elastic collision in one dimension,

Inelastic collision: Only momentum is conserved.

Coefficient of restitution is defined as *the ratio of velocity of separation to the velocity of approach.*

Coefficient of restitution

$$= e = \frac{v_2 - v_1}{u_1 - u_2}$$

$e = 1$ for perfectly elastic collision

$e = 0$ for perfectly inelastic collision

Centre of Mass: *It is an imaginary point at which the whole mass of a body is supposed to be concentrated.*

Torque and Angular Momentum

Torque is the moment of force. It is the cross product of the force with the perpendicular distance between the axis of rotation and the point of application of force with the force.

Torque = $\vec{\tau} = \vec{r} \times \vec{F}$; S.I. unit is N – m

Angular momentum is the moment of linear momentum. It is also the product of the linear momentum and the perpendicular distance of the mass from the axis of rotation.

$\vec{\tau} = \vec{r} \times \vec{p}$ where $\vec{p}$ = position relative to origin

= linear momentum at position.

Angular momentum $L = \vec{r} \times \vec{p}$ =: S.I unit kg m^2/s

Relation between torque and angular momentum,

$$\vec{T} = \frac{d\vec{L}}{dt}$$

Moment of Inertia

It is equivalent to mass in rotational motion. It is defined as *the sum of the product* of *the constituent masses and the square of their perpendicular distances from the axis of rotation.*

For an n-particle system having mass points m_1, m_2, m_3, ..., m_n at perpendicular distances r_1, r_2, ..., r_n, moment of inertia,

$$I = m_1 r_1^2 \, m_2 r_2^2 \ldots\ldots\ldots + m_n r_n^2$$

$$= \sum_{i=1}^{n} m_i r_i^2$$

S.I. unit is kgm^2 and it is a scalar quantity.

Gravitation

It is the force of attraction between any two bodies.

Newton's Universal Law of Gravitation: Every body in this universe attracts every other body with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

$$F \propto m_1 m_2 \text{ and } F \propto \frac{1}{r^2} \Rightarrow F \propto \frac{m_1 m_2}{r^2}$$

$$\therefore F = G\frac{m_1 m_2}{r^2}$$

G = Universal gravitational constant

$= 6.67 \times 10^{-11}$ Nm^2/kg^2

Acceleration due to gravity: The acceleration produced in a body due to gravitational force of the earth is called acceleration due to gravity (g).

$g = \frac{GM_e}{Re^2}$ (on the surface of the earth);

M_e = mass on the earth and R_e = radius of the earth.

$$M_e = \frac{gR_e^2}{G} = 6 \times 10^{24} \text{ kg},$$

$R_e = 6400$ km;

Acceleration due to gravity. g is maximum at poles and least (zero) at equator.

Gravitational Potential: Gravitational potential at a point in a gravitational field is defined as *the work done in taking a unit mass from infinity to the point*.

Gravitational potential = $V = \frac{-GM}{r}$

Escape Speed: Minimum speed required to escape the earth's gravitational pull.

$$v_e = \sqrt{2gr} = \sqrt{2} \times v_o \text{ (For earth } v_e = 11.2 \text{ km/s)}$$

where v_0 = orbital speed

Satellite

It is a heavenly body or an artificial object which revolves round a planet in a particular orbit. The required centripetal force is provided by the gravitational force. Kepler's laws of planetary motion are applicable to them.

(a) Orbital velocity of a satellite: Velocity with which the satellite orbits around the planet.

$$v_o = \sqrt{\frac{GM}{R+h}}$$

(b) Time period of a satellite: Time taken by it to complete one revolution around the planet.

$$T = \sqrt{\frac{3\pi(R+h)^3}{G\rho R^3}} = \frac{2\pi}{R}\sqrt{\frac{(R+h)^3}{g}}$$

(c) Height of a satellite above the surface of the planet:

$$H = \left(\frac{T^2R^2g}{4\pi^2}\right) - R$$

(d) "Total energy of a satellite orbiting on a circular path is negative" with potential energy being negative but twice as the magnitude of positive kinetic energy.

(e) Binding energy of a satellite is the energy required to remove it from its orbit to infinity.

B.E. = $\frac{GMm}{2r}$ No energy is required to keep the satellite in its orbit.

Geostationary satellites: The satellites in a circular orbit around the earth in the equatorial plane with a time period of 24 hours, appears to be fixed from any point on earth are called geostationary satellite.

For geostationary satellite, height above the earth's surface = 35800 km and orbital velocity = 3.1 km/s.

Polar Satellites: A satellite that revolves in a polar orbit along north-south direction while the earth rotates around its axis in east west direction.

Weightlessness: A situation where the effective weight of the object becomes zero. An astronaut experiences weightlessness in space satellite because the astronaut as well as the satellite are in a free fall state towards the earth.

PROPERTIES OF MATTER

Elasticity and Plasticity

The property of the body to regain its original configuration (length, or shape) when the deforming forces are removed is called ***elasticity***. On the other hand, *if the body does not have any tendency to regain its original configuration on removal of deforming force the body is called plastic body and this property is called* ***plasticity***.

Perfectly elastic body: A body which regains its original configuration immediately and completely after the removal of deforming force from

it, is called perfectly elastic body. Quartz and phosphor bronze, are closed to perfectly plastic body.

Perfectly plastic body: A body which does not regain its original configuration at all on the removal of deforming force, however small the deforming force may be is called perfectly plastic body. Putty and mud are closed to perfectly plastic body.

Stress: *The internal restoring force acting per unit area of a body is called stress.*

i.e., *Stress = Restoring force/ Area*

Strain: The ratio of change in configuration to the original configuration is called strain.

$$i.e.,\ Strain = \frac{Change\ in\ configuraion}{Original\ configuration}$$

Strain being the ratio of two like quantities has **no units** and **dimensions**.

Elastic Limit

Elastic limit is the upper limit of deforming force up to which, if deforming force is removed, the body regains its original form completely and beyond which, if deforming force is increased, the body loses its property of elasticity and gets permanently deformed.

Hooke's law

It states that *within the elastic limit stress is directly proportional to strain.*

i.e., Stress ∝ strain

or Stress = E × strain

Here E is the coefficient of proportionality and is called **modulus of elasticity** or **coefficient of elasticity** of a body.

Materials-Ductile, Brittle and Elastomers

(i) **Ductile materials:** *The materials which have large range of plastic extension* are called ductile materials. They can be drawn into thin wires, e.g., copper, silver, aluminium, iron, etc.

(ii) **Brittle materials:** *The materials which have very small range of plastic extension* are called brittle materials. These materials break as soon as the stress is increased beyond the elastic limit. e.g., glass, ceramics, cast iron, etc.

(iii) **Elastomers:** *The materials which can be stretched to large values of strain* are called elastomers. *e.g.*, rubber, elastic tissue of aorta, etc.

Young's modulus of elasticity (Y): It is defined as *the ratio of normal stress to the longitudinal strain within the elastic limit.*

$$\text{Thus, } Y = \frac{Normal\ stress}{Longitudinal\ strain}$$

Fluids

Fluids are the substances that can flow. Therefore liquids and gases both are fluids. The study of fluids at rest is called **fluid statics** or **hydrostatics** and the study of fluids in motion is called **fluid dynamics** or **hydrodynamics**. Both combined are called **fluid mechanics**.

Density (ρ)

Mass per unit volume is defined as density. So density at a point of a fluid is represented as

$$\rho = \lim_{\Delta v \to 0} \frac{dm}{dV} = \frac{dm}{dV}$$

Relative Density

It is defined as the ratio of the density of the given fluid to the density of pure water at 4°C.

$$\text{Relative density (R.D).} = \frac{Density\ of\ given\ liquid}{Density\ of\ pure\ water\ at\ 4°C}$$

The density of water is maximum at 4°C and is equal to 1.0×10^3 kgm^{-3}

Pressure

If a uniform force is exerted normal to an area (A), then *average pressure (p_{av}) is defined as the normal force (F) per unit area.*

$$i.e.,\quad P_{av} = \frac{F}{A}$$

In limiting sense, *pressure* $p = \lim_{\Delta A \to 0} \frac{\Delta F}{\Delta A}$ Pressure is a scalar quantity.

SI unit: pascal (Pa), 1 Pa = 1 N/m^2
Practical units: atmospheric pressure (atm), bar and torr
1 atm = 1.01325 × 10^{5}Pa = 1.01325 bar = 760 torr = 760mm of Hg column pressure.

Pascal's Law of Transmission of Fluid Pressure

Pascal's law is stated in following ways:

- The pressure in a fluid at rest is same at all the points if gravity is ignored.
- A liquid exerts equal pressures in all directions.
- If the pressure in an enclosed fluid is changed at a particular point, the change is transmitted to every point of the fluid and to the walls of the container without being diminished in magnitude.

Applications of Pascal's law: Hydraulic machines, lifts, presses and brakes, are based on the Pascal's law.

Atmospheric Pressure

Force exerted by air column on unit cross-section area of sea level is called atmospheric pressure (P_0)

$$P_0 = \frac{F}{A} = 101.3 kN/m^2$$

Barometer is used to measure atmospheric pressure which was **discovered by Torricelli**.

Atmospheric pressure varies from place to place and at a particular place from time to time.

Buoyancy and Archimed Principle

If a body is partially or wholly immersed in a fluid, it experiences an upward force due to the fluid surrounding it. This phenomenon of force exerted by fluid on the body is called **buoyancy** and force is called **buoyant force** or **upthrust**.

Archimedes' Principle: *It states that the buoyant force on a body that is partially or totally immersed in a fluid equal to the weight of the fluid displaced by it*.

Bernoulli's Principle

When incompressible, non-viscous, irrotational liquid i.e., ideal liquid flow from one position to other in streamline path then in its path at every point, the sum of pressure energy, kinetic energy and potential energy per unit volume remains constant.

$$i.e., \; P_1 + \rho g h_1 + \frac{1}{2}\rho v_1^2 = P_2 + \rho g h_2 + \frac{1}{2}\rho v_2^2$$

$$\therefore \quad P + \rho g h + \frac{\rho v^2}{2} = constant$$

Viscosity

The property of a fluid due to which it opposes the relative motion between its different layers is called viscosity (or fluid friction or internal friction) and the force between the layers opposing the relative motion is called **viscous force**.

Terminal Velocity

It is maximum constant velocity acquired by the body while falling freely in a viscous medium.

$$V_T = \frac{2r^2(\rho - \sigma)g}{9\eta}$$

Surface Tension

Surface tension is basically a property of liquid. The liquid surface behaves like a stretched elastic membrane which has a natural tendency to contract and tends to have a minimum possible surface area. This property of liquid is called surface tension.

$$Surface\ tension\ T = \frac{Force\ F}{Length\ L}$$

Examples of surface tension

(i) Raindrops are spherical in shape.
(ii) The hair of a shaving brush cling together when taken out of water.
(iii) Oil spread on cold water but remains as a drop on hot water etc.

Capillarity

A glass tube with fine bore and open at both ends is known as **capillary tube**. *The property by virtue of which a liquid rise or fall in a capillary tube is known as* ***capillarity***. Rise or fall of liquid in tubes of narrow bore (capillary tube) is called capillary action. Rise of kerosene in lanterns, rise of ink in fountain pen etc. are due to capillary action.

HEAT

Temperature and Heat

Temperature *is defined as the degree of hotness or coldness of a body.* It is a scalar quantity. **Its S.I. unit** is kelvin (K).

Heat *is a form of energy which causes sensation of hotness or coldness*. The flow of heat is always from higher temperature to lower temperature. No heat flows from one body to other, when both the bodies are at the same temperature. The two bodies are said to be in **thermal equilibrium.** The **SI unit** of heat is **joule**. Its **CGS unit** is **calorie**, 1 cal = 4.2 joule

Measurement of Temperature

A branch of science which deals with the measurement of temperature of a substance is called **thermometry.**

Thermometer is a device used to measure the temperature. Thermometer used for measuring very high temperatures are called **pyrometer**.

Relationship Between Different Scales of Temperature

$$\frac{C-0}{100}=\frac{F-32}{212-32}=\frac{K-273.16}{373.16-273.16}$$

$$=\frac{R-0}{80-0}=\frac{Ra-460}{672-460}$$

T°(K) = (t°C + 273.16)

Normal temperature of human body is 310.15 k (37°C = 98.6°F)

STP or NTP implies 273.15 K (0°C = 32°F)

Ideal-gas Equation and Absolute Temperature

The equation, $PV = nRT$

where, n = number of moles in the sample of gas

R = universal gas constant; (its value is 8.31 J mol^{-1} K^{-1}), is known as **ideal-gas equation**

It is the combination of following three laws

(i) Boyle's law: *When temperature is held constant, the pressure is inversely proportional to volume.*

i.e., $P \propto \frac{1}{V}$ (at constant temperature)

(ii) Charle's law: *When the pressure is held constant, the volume of the gas is directly porportional to the absolute temperature.*

i.e., $V \propto T$ (at constant pressure)

(iii) Avogadro's law: *When the pressure and temperature are kept constant, the volume is directly proportional to the number of moles of the ideal gas in the container.*

i.e., $V \propto n$ (at constant pressure and temperature)

Absolute Temperature

The lowest temperature of –273.16 °C at which a gas is supposed to have zero volume and zero pressure and at which entire molecular motion stops is called absolute zero temperature. A new scale of temperature starting with –273.16°C by Lord Kelvin as zero. This is called Kelvin scale or absolute scale of temperature.

T(K) = t°C + 273.16

Thermal Expansion

The increase in the dimensions of a body due to the increase in its temperature is called thermal expansion.

Linear expansion: *The fractional increase in length per °C rise in temperature is called* ***coefficient of linear expansion****.* Coefficient of linear expansion,

$$\alpha = \frac{\left(\frac{\Delta l}{l}\right)}{\Delta T} = \frac{dl}{l.dT}$$

Superficial expansion: On increasing the temperature of a solid, its area increases. This increase in area is referred as **superficial expansion**.

Coefficient of superficial expansion *is*

defined as the fractional increase in area per °C rise in temperature.

i.e., Coefficient of a real expansion

$$\beta = \frac{DA / A}{DT} = \frac{dA}{A.dT}$$

Cubical expansion: On increasing the temperature of a solid, its volume increases. This increase in volume with increase in temperature is called cubical or volume expansion.

Coefficient of volume expansion *is defined as the fractional increase in volume per °C rise in temperature.*

i.e., Coefficient of volume expansion,

$$\gamma = \frac{\Delta V / V}{\Delta T} = \frac{dV}{V.dT}$$

Relation between coefficient of linear expansion (α), coefficient of superficial expansion (β) and coefficient of cubical expansion (γ)

$$\alpha = \frac{\beta}{2} = \frac{\gamma}{3} \Rightarrow \alpha : \beta : \gamma = 1 : 2 : 3$$

Anomalous Expansion of Water

Almost all liquids expand on heating but water when heated from 0°C to 4°C its volume decreases and hence density increases until its temperature reaches 4°C. Its density is maximum at 4°C on further heating its density decreases. This behaviour of water is called anomalous behaviour of water.

Specific Heat Capacity

It is *the amount of heat energy needed to raise the temperature of unit mass of substance by 1°C (or 1K).*

It is denoted by **s or c**.

C_{water} *= 1 cal/g °C = 1 cal/g K = 1 kcal/kg K=4200 joule/kg K*

Latent Heat or Hidden Heat

When state of a substance changes, change of state takes place at constant temperature (m.pt. or b.pt.) heat is released or absorbed and is given by,

$$Q = mL$$

where **L is latent heat**.

Change of State

Any state of a substance (solid/ liquid/ gas) can be changed into another by heating or cooling. The transition of a substance from one state to another is called a change of state.

Some common changes of states:

(i) Melting: When heat is supplied, solid substance changes into liquid, this change of state of substance is called melting.

$$\text{Solid} \xrightarrow{\text{Heat}} \text{Liquid}$$

The temperature at which the solid and the liquid states of a substance coexist in thermal equilibrium with each other is called its **melting point**.

(ii) Freezing: When heat is released, liquid changes into solid, this change of state of substance is called freezing.

$$\text{Liquid} \xrightarrow{\text{Cool}} \text{Solid}$$

(iii) Condensation: When vapour is cooled, it changes into liquid, this change of state is called condensation

$$\text{Vapour} \xrightarrow{\text{Cool}} \text{liquid}$$

(iv) Evaporation: Conversion of liquid into gaseous state at all the temperatures is called evaporation or boiling.

$$\text{Liquid} \xrightarrow{\text{Heat}} \text{Vapour}$$

The temperature at which the liquid and vapour states of a substance coexsist in thermal equilibrium with each other is called its **boiling point**.

It is a phenomenon that occurs at the surface of liquids. The rate of evaporation increases with rise in temperature. Heat required to change unit mass of liquid into vapour at a given temperature is called heat of evaporation at that temperature.

(v) Sublimation: It is the conversion of a solid directly into vapours.

$$\text{Solid} \xrightarrow{\text{Heat}} \text{Vapour}$$

Sublimation takes place when boiling point is less than the melting point.

Heat transfer: Heat energy transfer from a body at higher temperature to a body at lower temperature by three different methods. They are conduction, convection and radiation.

Conduction: *Conduction is that mode of transmission of heat in which heat is transferred from a region of higher temperature to a region of lower temperature by the aid of particles of the body without their actual migration. Conduction requires material medium.*

Convection: Convection like conduction requires a material medium. *It is the process in which heat is transferred from one place to other by actual movement of heated material particles.*

Radiation: When a body is heated and placed in vacuum, it loses heat even when there is no medium surrounding it.

The process by which heat is lost in this case is called radiation. This does not require the presence of any material medium. It is by radiation that the heat from the sun reaches the earth.

Newton's Law of Cooling

The rate of cooling of a body (rate of loss of heat) is directly proportional to the excess of temp. of the body over the surroundings, provided that this excess is small and loses of heat by radiation only.

If θ and θ_0 are the temperatures of the body and its surroundings respectively, then according to Newton's law of cooling,

Rate of loss of heat, $-\frac{dQ}{dt} \propto (\theta - \theta_0)$

Thermodynamics

The **thermodynamics** *is the branch of science in which the conversion of heat into mechanical work and vice versa is studied.*

Triple point of water: The triple point of water represents the co-existence of all the three phases of water ice, water and water vapour in equilibrium. The pressure corresponding to triple point of water is 6.03×10^{-3} atmosphere or 4.58 mm of Hg and temperature corresponding to it is 273.16 K.

Zeroth Law of Thermodynamics

If objects A and B are separately in thermal equilibrium with a third object C then objects A and B are in thermal equilibrium with each other.

First Law of Thermodynamics

If some quantity of heat is supplied to a system capable of doing external work, then the quantity of heat absorbed by the system is equal to the sum of the increase in the internal energy of the system and the external work done by the system.

i.e., $\delta Q = \delta U + \delta W$

The first law of thermodynamics is essentially a restatement of the law of conservation of energy, i.e., energy can neither be created nor be destroyed but may be converted from one form to another.

Heat Engines

Heat engine is a device which converts heat energy into work.

Efficiency of heat engine,

$$\eta = \frac{Work\ done(W)}{Heat\ taken\ from\ source(Q_1)}$$

$$\eta = \frac{T_1 - T_2}{T_1} = \frac{Q_1 - Q_2}{Q_1} = 1 - \frac{Q_2}{Q_1}$$

Refrigerators and Heat Pumps

A refrigerator is the reverse of a heat engine. A heat pump is the same as a refrigerator.

The **coefficient of performance** of a refrigerator or heat pump.

$$\frac{Q_1}{W} = \frac{Q_2}{Q_1 - Q_2} \quad [\because W = Q_1 - Q_2]$$

Carnot Theorem

No irreversible engine (I) can have efficiency greater than Carnot reversible engine (R) working between same hot and cold reservoirs.

i.e., $\eta_R > \eta_I$ *or* $1 - \frac{T_2}{T_1} > 1 - \frac{Q_2}{Q_1}$

SOUND

Periodic Motion

Any motion that repeats itself in equal intervals of time is called periodic motion. A periodic motion can be represented in terms of sines and cosines, so it is called a harmonic motion. The uniformly rotating earth represents a periodic motion that repeats itself at every 24 hours.

An oscillatory motion is always periodic but a periodic motion may not be oscillatory.

Examples of S.H.M. (i) clock pendulum, (ii) oscillating liquid in a U-tube, (iii) oscillating block in a liquid, (iv) oscillating frictionless piston fitted in a cylinder filled with ideal gas, etc.

Sound

Sound is a form of energy which produces a sensation of hearing in our ears.

Sound Needs a Material Medium for its Propagation

In the absence of medium (air) around the source, sound is not being propagated and light (electromagnetic) waves travel through the vacuum.

Mechanical Waves

A mechanical wave is a periodic disturbance which requires a material medium for its propagation.

(a) Transverse wave: *When the particles of the medium vibrate in a direction perpendicular to the direction of propagation of the wave, the wave is known as the transverse wave. For example, waves produced in a stretched string, waves on the surface. These waves travel in form of crests and troughs. These waves can travel in solids and liquids only.*

(b) Longitudinal wave: *When the particles of the medium vibrate along the direction of propagation of the wave then the wave is known as the longitudinal wave. For example sound wave in air, waves in a solid rod produced by scrabbing etc.*

These waves travel in the form of compressions and rarefactions. These waves can travel in solids, liquids and gases.

Electromagnetic Waves

The waves which do not require medium for propagation are called electromagnetic waves. This means that these waves can travel through vacuum also. For example, light waves, X-rays, γ-rays, Infrared waves, radio waves, microwaves, etc. These waves of transverse type.

Difference between sound waves and electromagnetic waves

(i) Sound waves are longitudinal and electromagnetic waves are transverse.

(ii) Sound waves travel at a speed of 340 m/s whereas electromagnetic waves travel at a speed of 3×10^8 m/s

(iii) Sound waves do not pass through a vacuum but electromagnetic waves (light) do.

Characteristics of Sound Waves

Sound is characterised by three parameters:

(i) Pitch (ii) Loudness (iii) Quality

(i) Pitch: Pitch is the sensation (brain interpretation) of the frequency of an emitted sound and is the characteristic which distinguishes a shrill (or sharp) sound from a grave (or flat) sound.

(ii) Loudness: Loudness or softness of a sound wave is the sensation that depends upon its amplitude. The loudness of sound is a measure of the sound energy reaching the ear per second. The loudness of sound is measured in '**decibel** dB'. The

loudness of sound of people talking quietly is about 65 dB, the loudness of sound in a very noisy factory is about 100 dB.

(iii) Quality (Timber): Quality or timber of a sound wave is that characteristic which helps us in distinguishing one sound from another having same pitch and loudness. We recognise a person (without seeing) by listening to his sound as it has a definite quality.

A pure sound of single frequency is called a tone.

An impure sound produced by mixture of many frequencies is called a note. It is pleasant to listen.

Reflection of Sound

When sound waves strike a surface, they return back into the same medium. This phenomenon is called reflection.

Laws of reflection of sound waves

(i) Angle of incidence is equal to the angle of reflection.

(ii) The incident wave, the reflected wave and the normal all lie in the same plane.

Echo

Phenomenon of hearing back our own sound is called an echo. It is due to successive reflection from the surface of obstacles of large size.

Conditions for the formation of Echoes

(i) The minimum distance between the source of sound and the reflecting body should be 17.2 metres.

(ii) The wavelength of sound should be less than the height of the reflecting body.

(iii) The intensity of sound should be sufficient so that it can be heard after reflection.

Reverberation

Persistence of sound after its production stopped, is called reverberation.

When a sound is produced in a big hall, its wave reflect from the walls and travel back and forth. Due to this energy does not reduce and the sound persist.

A short reverberation is desirable in a concert hall (where music is being played) because it gives 'life' to sound.

OPTICS

Optics

The branch of physics which deals with the propagation, nature and behaviour of light is known as **optics**.

Light

Light is a form of energy which enables human beings and creatures to 'see' things.

Light is an electromagnetic radiation which exhibits properties like a wave as well as a particle. It always propagates in a straight line.

Light travels with a speed nearly equal to 3×10^8 m/s. According to current theories, no material particle can travel at a speed greater than the speed of light.

Luminous and Non-luminous Objects

Luminous objects are those which emit its own light e.g., sun, glowworm, burning candle, electric lights. *Non-luminous objects do not give out its own light but are visible only when light from a luminous object falls on it. e.g.*, moon, earth, table, paper, etc.

Transparent, Translucent and Opaque materials

Transparent materials are those which allow most of light to pass through them. *Example:* Glass, water, air.

Translucent materials allow only a part of light to pass through it. We cannot see distinctly through them. *Example*: greased paper, paraffin wax, etc.

Opaque materials do not allow any light to pass through it. They reflect or absorb all the light that falls on

them. *Example*: Books, desk, stone, rubber, trees, etc.

Reflection of Light

The turning back of light in the same medium is called reflection of light.

Laws of reflection

1. The angle of incidence '*i*' is equal to the angle of reflection '*r*'.
2. At the point of incidence, the incident rays, the normal to the surface and the reflected ray all lie in the same plane.

Images and their properties

An 'image' is defined as the impression of an object carried over and formed by light reflected from it. An image is said to be a **real image** if it can be caught on a screen, and a **virtual image** if it cannot be caught on the screen. For example, the image on the screen in a theatre is a real image and the image observed in a plane mirror is a virtual image.

Real image

1. When the rays of light actually meet, the image so formed is known as real image.
2. A real image can be caught on a screen since it is formed by actual meeting of rays.
3. A real image is always inverted.
4. A real image is formed by a convergent reflected beam.
5. In ray diagrams, for real image, the rays are represented by full lines.

Virtual image

1. When the rays of light appear to meet, the image so formed is known as virtual image.
2. A virtual image cannot be caught on a screen since it is formed by meeting of imaginary rays.
3. A virtual image is always erect.
4. A virtual image is formed by a divergent reflected beam.
5. In ray diagrams, for virtual image, the rays are generally represented by dotted lines.

Characteristics of images formed by a plane mirror

The image formed by a plane mirror is

(a) virtual (the image cannot be formed on a screen)
(b) upright
(c) laterally inverted (the left side of an image is formed by the right side of an object)
(d) the same size as the object
(e) the same distance behind the mirror as the object is in front of the mirror

Concave and Convex Mirror

Concave mirror: If the reflection takes place from the inner surface of a spherical mirror, then the mirror is called concave mirror.

Convex mirror: If the outer surface of the spherical mirror acts as a reflector then the mirror is called convex mirror.

Uses of concave mirrors:

(i) In torches, search-lights and vehicles headlights to get powerful beams of light.
(ii) As a shaving mirror to see a large image of the face.
(iii) As a dentists mirror to see large images of the teeth of patients.
(iv) Large sized concave mirror is used to concentrate sunlight to produce heat in solar furnaces.

Uses of convex mirrors:

(i) As a rear -view mirrors in vehicles.
(ii) For security purposes.

Mirror Formula

If an object is placed at a distance u from the pole of a mirror and its image is formed at a distance v (from the pole) then,

$$\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$$

Magnification

If a thin object linear size O situated vertically on the axis of a mirror at a distance u from the pole and its image of size I is formed at a distance v (from the pole), magnification (transverse) is defined as

$$m = \left[\frac{I}{O}\right] = \left[\frac{v}{u}\right]$$

→ (+ve means erect image)
→ (–ve means inverted image)
→ (|m| >1 means large image)
→ (|m| < 1 means small image)

Refraction of Light

When a ray of light passes from one medium to another medium it bends – towards the normal when goes from rarer to denser and away from the normal when goes from denser to rarer medium. This phenomenon is called refraction of light.

Twinkling of stars, sun is visible to us about 2 minutes before the actual sunrise, and about 2 minutes after actual sunset etc. due to atmospheric refraction.

Refractive index

Refractive index of medium II with respect to medium I

$$\mu_{21} = \frac{Speed\ of\ light\ in\ medium\ I}{Speed\ of\ light\ in\ medium\ II}$$

Laws of Refraction

(i) **Snell's law:** For any two media and for light of a given wavelength, the ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant.

i.e., $\frac{\sin i}{\sin r} = \text{constant}$ where i = incidence angle, r = refraction angle.

(ii) The incident ray, the refracted ray and the normal at the incident point all lie in the same plane.

When object is in denser medium and observer is in rarer medium:

$$\text{Refractive index } \mu = \frac{Real\ depth}{Virtual\ depth}$$

Lens

A lens is a piece of transparent material with two refracting surfaces such that atleast one is curved and refractive index of used material is different from that of the surroundings.

Refraction through a thin lens (lens formula)

If an object is placed at a distance u from the optical centre of a lens and its images is formed at a distance v (from the optical centre) and focal length of this length is f then

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

This is called lens formula.

Power of a lens

The power of a lens is defined as

$P = \frac{1}{f(\text{in } m)}$. The unit of power is diopter.

Focal length of a lens (lens maker's formula)

$$\frac{1}{f} = ({}_m\mu_\ell - 1)\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$$

where ${}_m\mu_\ell$ refractive index of lens with respect to medium.

R_1 = radius of curvature of first surface of lens, R_2 = radius of curvature of second surface of lens.

Total Internal Reflection

When the object is placed in an optically denser medium and if the incident angle is greater than the critical angle then the ray of light gets reflected back to the originating medium. This phenomenon is called total internal reflection.

Critical angle (i_c): When a ray passes from an optically denser medium to an optically rarer medium, the angle of refraction r is greater than the corresponding angle of incidence i. From Snell's law.

Let $\mu_1 = \mu_2$ and $\mu_2 = 1$ and let for i = i_c, r = 90° then $\sin i_c = 1/\mu$

$\therefore\ i_c = \sin^{-1}\frac{1}{\mu}$; i_c is called the critical angle.

This phenomenon takes place in shining of air bubble, sparkling of diamond, mirage, looming, in optical communication, endoscopy using optical fibre.

Dispersion of Light

When a white ray of light or sunlight passes through a prism it breakes into its seven constituents colours violet, indigo, blue, green, yellow, orange and red (VIBGYOR). This phenomenon is called ***dispersion of light***. The band of seven constituents colours is called **spectrum.** The deviation is maximum for violet colour and least for red colour.

The Rainbow

A rainbow is a spectrum of white light from the sun. This is a phenomenon due to combined effect of dispersion, refraction and reflection of sunlight by spherical water droplets of rain.

(i) **Primary rainbow:** It is formed due to two refractions and one total internal reflection of the light incident on the droplet. Sunlight is first refracted as it enters a raindrop which cause different colours of light to separate. The observer sees a rainbow with red colour on the top and violet on the bottom.

(ii) **Secondary rainbow:** It is formed due to two refractions and two total internal reflection of light incident on the water droplet. It is due to four - step process. The intensity of light is reduced at the second reflection and hence the secondary rainbow is fainter than the primary rainbow.

Scattering of Light

As sunlight travels through the earth's atmosphere it gets scattered by the small particles present in the atmosphere.

According to Rayleigh law, the amount of scattering is inversely proportional to the fourth power of the wavelength $\left(\frac{1}{\lambda^4}\right)$.

Phenomenon based on scattering of light

(i) **Blue colour of sky:** Blue colour has a shorter wavelength than red colour therefore blue colour is scattered strongly. Hence the bluish colour predominates in a clear sky.

(ii) **White colour of clouds:** Clouds contain large dust particles, water droplets or ice particles. These large sized Particles do not obey Rayleigh law of scattering. All wavelengths are scattered nearly equally. Hence clouds are generally white.

(iii) **Sun looks reddish at the Sunset or Sunrise:** At sunset or sunrise, the sun's rays have to pass through a larger distance in the atmosphere. Most of the blue and other shorter wavelengths are scattered. The least scattered light reaching our eyes, therefore the sun looks reddish.

Power of Accomodation of Eye

The ability of the lens to change its shape to focus near and distant objects is called accommodation.

A normal human eye can see objects clearly that are between 25 cm and infinity.

Microscope: It is an optical instrument used to see magnified image of a tiny objects.

Resolving power (R.P.) of a microscope

Resolving power of a microscope is defined as the reciprocal of the least separation between two close objects, so

that they appear just separated, when seen through the microscope.

Telescope (Astronomical): *It is an optical instrument used to increase the visual angle of distant large objects.*

It is used to see far off objects clearly.

Resolving power (R.P.) of a telescope

Resolving power of telescope is defined as the reciprocal of the smallest angular separation between two distant objects, so that they appear just separated, when seen through the telescope.

$$\text{Resolving power of telescope} = \frac{D}{1.22\lambda}$$

Interference of Light Waves

The phenomenon of redistribution of light energy in a medium due to superposition of light waves from two coherent sources is called interference of light.

Conditions for sustained interference:

(i) Two sources must be coherent.
(ii) Amplitudes of waves should be either equal or approximately equal.
(iii) Light should be monochromatic.

Polarisation

It is the phenomenon of restricting the vibration of light in a particular plane. Light waves are transverse in nature i.e., the electric field vector associated with light wave is always at right angles to the direction of propagation of the wave. When unpolarised light is incident on a polaroid (Nicol Prism), the light wave gets linearly polarised i.e., the vibration of electric field vector are along a single direction.

ELECTRICITY

Electric Charges

Charge is something associated with matter due to which it produces and experiences electric and magnetic effects.

The study of charges at rest is called **static electricity** or **electrostatics** while the study of charges in motion is called **current electricity**. There are two types of electric charge:

(i) *Positive charge* and (ii) *Negative charge*

The magnitude of elementary positive or negative charge is same and is equal to 1.6×10^{-19} C.

Charge is a scalar quantity and its **SI unit** is ampere second or **coulomb** (C).

Basic Properties of Electric Charge

(1) *Similar charges repel and opposite charges attract.*
(2) *A charged body attracts light uncharged bodies.*
(3) *Accelerated charge radiates energy.*

Conductors and Insulators

The materials which allow electric charge (or electricity) to flow freely through them are called **conductors**. Metals are very good conductors of electric charge. Silver, copper and aluminium are some of the good conductors of electricity.

The materials which do not allow electric charge to flow through them are called **nonconductors** *or* **insulators**.

For example, most plastics, rubber, non-metals (except graphite), dry wood, wax, mica, porcelain, dry air etc., are insulators.

Coulomb's Law

It states that, *the electrostatic force of interaction (repulsion or attraction) between two electric charges q_1 and q_2 separated by a distance r, is directly proportional to the product of the charges and inversely proportional to the square of distance between them.*

i.e., $F \propto q_1 q_2$ and $F \propto 1/r^2$

or $F = k\frac{q_1 q_2}{r^2}$

$$K = \frac{1}{4\pi\varepsilon_0} = 9\times10^9 \frac{Nm^2}{coul^2} \Rightarrow \varepsilon_0$$

$$= 8.85\times10^{-12} \frac{coul^2}{NM^2}$$

Electric Field

The region surrounding an electric charge or a group of charges in which another charge experiences a force of attraction or repulsion is called 'electric field'.

$$\vec{E} = \frac{\vec{F}}{q_0}, \vec{E} = \lim_{q_0 \to 0} \frac{\vec{F}}{q_0}$$

The **S.I. unit** of electric field intensity is N/coul or volt/metre.

Electric Lines of Force

An electric line of force is that imaginary smooth curve drawn in an electric field along which a free isolated unit positive charge moves.

Two lines of force never intersect. If they are assumed to intersect, there will be two directions of electric field at the point of intersection, which is impossible.

Capacitors and Capacitance

A capacitor or condenser *is a device that stores electrical energy. It consists of conductors of any shape and size carrying charges of equal magnitude and opposite signs and separated by an insulating medium*

The symbol of a capacitor is ⊣⊢ or ⊣(

The net charge on a capacitor is zero.

Capacitance or **capacity** *of a capacitor is a measure of ability of the capacitor to store charge on it.*

When a conductor is charged then its potential rises. The increase in potential is directly proportional to the charge given to the conductor.

i.e., $Q \propto V$ or $Q = CV$ or, $C = \frac{Q}{V}$

The constant C is known as the **capacitance of the conductor.**

Its **SI unit** is farad (F) or coulomb/volt

Capacitance of the conductor depends upon:

(i) Size of conductor
(ii) Surrounding medium
(iii) Presence of other conductors nearby

Electric Current

The time rate of flow of charge through any cross-section is called electric current.

If Δq charge passes through a cross-section in time Δt then,

average current $I_{av} = \frac{\Delta q}{\Delta t}$

Instantaneous current

$$I = \lim_{\Delta t \to 0} \frac{\Delta q}{\Delta t} = \frac{dq}{dt}$$

Electric current is measured in **ampere (A).**

Types of electric current:

(a) Direct current: *The current whose magnitude and direction does not vary with time is called direct current (dc).* The various sources are cells, dc dynamo, etc.

It's symbol is 

(b) Alternating current: *The current whose magnitude continuously changes with time and periodically changes its direction is called alternating current.* It has constant amplitude and has alternate positive and negative halves. It is produced by ac dynamo.

It's symbol is 

Resistance, Conductance and Resistivity Resistance (R): *It is the property of a substance due to which it opposes the flow of current through it.*

Its **SI unit** volt/ampere called **ohm (Ω)**.

$$R \propto L \text{ and } R \propto \frac{1}{A} \text{ so, } R \propto \frac{L}{A}$$

$$\text{or } R = \rho \frac{L}{A}$$

where L = length, A = area of cross-section of wire and ρ is called **resistivity** or **specific resistance**.

The reciprocal of specific resistance is **conductance** i.e. $\sigma = \frac{1}{\rho}$

Superconductors

At a very low temperature, the resistance of the conductor may vanish completely. When it happens, the conductor is called a **superconductor**. For example, helium is a super conductor at 4.2 K (– 268.8°C).

Ohm's Law

It states that if the physical state i.e. temperature, nature of material and dimensions of a conductor remain unchanged then the ratio of potential difference applied across its ends to current flowing through it remains constant.

i.e., $V \propto I$ or $V = IR$, where $R = \frac{V}{I}$ is the resistance of conductor.

Electrical Energy, Power

When a current is passed through a resistor energy is wasted in overcoming the resistance of the wire. This energy is converted into heat.

The heat generated (in joule) when a current of I ampere flows through a resistance of R ohm for T second is given by:

$$H = I^2RT = VIt = \frac{V^2}{R}t \ \ joule$$

$$= \frac{I^2RT}{4.2} calorie$$

This is the joule's law of heating

1 *unit of electrical energy*

$= 1$ *Kilowatt hour* $(1\ KWh) = 3.6 \times 10^6$ *joule*

This is known as **Board of trade (B.O.T)** unit of electrical energy.

Energy liberated per second is called its ***power****.* The electrical power P delivered or consumed by an electrical device is given by P = VI, where V = Potential difference across the device and I = current.

Ammeter : *An ammeter is a low resistance galvanometer used to measure strength of current in an electrical circuit.*

Conversion of galvanometer into ammeter:

A galvanometer can be converted to an ammeter by connecting a low resistance or shunt in parallel to coil of galvanometer.

Voltmeter: A voltmeter is a high resistance galvanometer used to measure potential difference.

Conversion of galvanometer into voltmeter:

A galvanometer is converted to a voltmeter by connecting a high resistance in series with the coil of galvanometer.

Alternating Current

When an alternating voltage is applied across a coil or a bulb, it sends a similar varying current (i.e., of the same nature as that of voltage) through the coil. The current is called alternating current (A.C.).

The current flowing in only one direction in a circuit is called direct current (D.C.). Batteries, thermocouples and solar cells are some of the sources of direct current.

Advantages of Alternating Current Over Direct Current

(i) A.C. can be obtained over a wide range of voltages. These voltages can be easily stepped up or stepped down with the help of transformers.

(ii) The generation of A.C. is found to be economical than that of D.C.

Transformers

It is a device used for transforming a low alternating voltage of high current into a high alternating voltage of low current and vice versa, without increasing power or changing frequency.

Principle: It works on the phenomenon of mutual induction.

If a low voltage is to be transformed into a high voltage, then the number of turns in secondary is more than those in primary. The transformer is called a **step up transformer.**

If a high voltage is to be transformed into a low voltage, then the number of turns in secondary is less than those in primary. The transformer is called a **step-down transformer.**

Uses of Transformer

A transformer is used in almost all ac operation.

(i) In voltage regulators for TV, refrigerator, computer, air conditioner etc.
(ii) In the induction furnaces.
(iii) Step down transformer is used for welding purposes.
(iv) In the transmission of ac over long distance.

AC Generator/Dynamo/Alternator

An electrical machine used to convert mechanical energy into electrical energy is knownm as AC generator/alternator or dynamo.

Principle: It works on the principle of electromagnetic induction, i.e., when a coil is rotated in uniform magnetic field, an induced emf is produced in it.

DC Motor

A D.C. motor converts direct current energy from a battery into mechanical energy of rotation.

Principle: It is based on the fact that when a coil carrying current is held in a magnetic field, it experiences a torque, which rotates the coil.

Efficiency of the d.c. motor:

$$\eta = \frac{EI}{VI} = \frac{E}{V} = \frac{Back\ e.m.f.}{Applied\ e.m.f.}$$

Uses of D.C Motor

1. The D.C. motors are used in D.C. fans (exhaust, ceiling or table) for cooling and ventilation.
2. They are used for pumping water.
3. Big D.C. motors are used for running tram-cars and even trains.

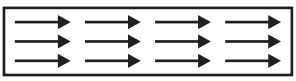
MAGNETISM

Magnetism

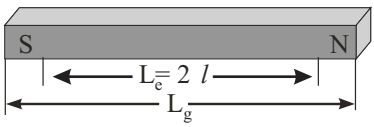
*The phenomenon of attracting magnetic substances like iron, cobalt, nickel etc. is called **magnetism**. A body possessing the property of magnetism is called **magnet**.*

Lodestone or **magnetite** is natural magnet. Earth is also a natural magnet.

In magnetised substance all the atomic magnets are aligned in same direction and thus resultant magnetism is non-zero.



Bar Magnet: A bar magnet consists of two equal and opposite magnetic poles separated by a small distance. Poles are not exactly at the ends. The shortest distance between two poles is called effective length (L_e) and is less than its geometric length (L_g). For bar magnet $L_e = 2l$ and $L_e = (5/6)\ L_g$.



Bar magnet

Properties of Magnet

(i) Attractive property: The places where its attracting power is maximum are called **poles**.

(ii) Directive property: When a magnet is suspended its length becomes parallel to N-S direction. The pole pointing north is called the north pole while the other pointing in the geographical south is called the south pole of the magnet.

(iii) Poles of a magnet always exist in pairs: In a magnet the two poles are found to be equal in strength and opposite in nature.

(iv) Repulsive property: A pole of a magnet attracts the opposite pole while repels similar pole.

Demagnetisation of Magnet

A magnet gets demagnetised, i.e., loses its power of attraction if it is *heated*, *hammered* or *alternating current is passed through a wire wound over it*.

Permanent and Temporary Magnets (Electromagnets)

The **permanent artificial magnets** are made of some metals and alloys like Carbon-steel, Alnico, Platinum-cobalt, Alcomax, Ticonal etc. The permanent magnets are made of ferromagnetic substances with large coercivity and retentivity

The **temporary artificial magnets** like electromagnets are prepared by passing current through coil wound on soft iron core. These cannot retain its strength for a long time. These are made from soft iron, non-metal and alloy. Electromagnets are stronger than permanent magnet.

Some Applications of Electromagnets

(i) Electric motors
(ii) Doorbells
(iii) In scrapyards to separate iron from other metals

Magnetic Field

The space around a magnet (or a current carrying conductor) in which its magnetic effect can be experienced is called the magnetic field.

Magnetic Lines of Force

Magnetic line of force is an imaginary curve tangent to which at a point gives the direction of magnetic field at that point or the magnetic field line is the imaginary path along which an isolated north pole will tend to move if it is free to do so.

Magnetic lines of force do not intersect each other. Because if they do, there will be two directions of magnetic field which is not possible.

The Earth's Magnetism

The branch of Physics which deals with the study of earth's magnetic field is called **terrestrial magnetism**. William Gilbert suggested that earth itself behaves like a huge magnet.

(a) A freely suspended magnet always comes to rest in N-S direction.
(b) A piece of soft iron buried in N-S direction inside the earth acquires magnetism.

Geographic meridian: It is a vertical plane passing through geographic north and south pole of the earth.

Geographic equator: A great circle on the surface of the earth in a plane perpendicular to geographical axis is called geographic equator. All places on geographic equator are at equal distances from geographical poles.

Magnetic meridian: It is a vertical plane passing through the magnetic north and south pole of the earth.

Magnetic equator: A great circle on the surface of the earth in a plane perpendicular to magnetic axis is called magnetic equator. All places on magnetic euqator are at equal distance from magnetic poles.

Magnetic Elements

The physical quantities which determine the intensity of earth's total magnetic field completely both in magnitude and direction are called magnetic elements.

Angle of declination (ϕ): *The angle between the magnetic meridian and geographical meridian at a place is called angle of declination.*

Angle of dip or inclination (θ): *The angle through which the N pole dips down with reference to horizontal is called the angle of dip.* At magnetic north and south pole angle of dip is 90°. At magnetic equator the angle of dip is 0°.

Horizontal component of earth's magnetic field: The total intensity of the earth's magnetic field makes an angle θ with horizontal. It has

(i) component in horizontal plane called **horizontal component B_H**.
(ii) component in vertical plane called **vertical component B_V**.

$B_V = B\sin\theta \qquad B_H = B\cos\theta$

So, $\frac{B_V}{B_H} = \tan\theta$ and $B = \sqrt{B_H{}^2 + B_V{}^2}$

Comparison of properties of soft iron and steel:

(1) The area of hysteresis loop for soft iron is much smaller than for steel, so energy loss per unit volume per cycle for soft iron is smaller than steel.
(2) The retentivity of soft iron is greater than that of steel.
(3) The coercivity of steel is much larger than that of soft iron.
(4) The magnetisation and demagnetisation is easier in soft iron than steel.
(5) Soft iron acquires saturation magnetisation for quite low value of magnetising field than in case of steel or soft iron is much strongly magnetised than steel.

Diamagnetic Substances: *The substances which when placed in a magnetic field are feebly magnetised in a direction opposite to that of the magnetising field are called diamagnetic substances.*

Some diamagnetic substances are Cu, Zn, Bi, Ag, Au, Pb, He, Ar, NaCl, H_2O, marble, glass, etc.

Paramagnetic Substances: *The substances which when placed in a magnetic field are feebly magnetised in the direction of magnetising field are called paramagnetic substances.*

Some paramagnetic substances are Al, Na, Sb, Pt, $CuCl_2$, Mn, Cr, liquid oxygen, etc.

Ferromagnetic Substances: *The substances which when placed in a magnetic field are strongly magnetised in the direction of the magnetising field are called ferromagnetic substances.*

Iron, cobalt, nickel, etc. are some examples of ferromagnetic substance.

SEMICONDUCTOR ELECTRONICS

Metals, Semiconductors and Insulators

On the basis of electrical conductivity (σ) or resistivity ($\rho = 1/\sigma$) the solids are classified as

(i) **Metals** – have low resistivity
$\rho \sim 10^{-2}$ to $10^{-8}\ \Omega m$
$\sigma \sim 10^{2}$ to $10^{8}\ Sm^{-1}$

(ii) **Semiconductors** – have intermediate resistivity
$\rho \sim 10^{5}$ to $10^{0}\ \Omega m$
$\sigma \sim 10^{-5}$ to $10^{0}\ Sm^{-1}$

(iii) **Insulators** – have high resistivity
$\rho \sim 10^{8}\ \Omega m$
$\sigma \sim 10^{-8}\ Sm^{-1}$

i.e. the **Semiconductors** are the materials whose conductivity is more than insulators but less than conductors.

Types of Semiconductors

Intrinsic semiconductors or Pure semiconductors

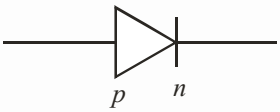
In semiconductors forbidden energy gap Eg is more than metals or conductors and less than insulators. Silicon (Si) and Germanium (Ge) are the examples of pure semiconductors. In pure or intrinsic semiconductor,

$n_e = n_h = n_i$ where, n_e = no. of electrons; n_h = no. of holes and n_i = no. of intrinsic carrier concentration.

(a) ***n* – type semiconductor:** Si or Ge with pentavalent doping.
(b) ***p* - type semiconductor:** Si or Ge with trivalent doping. The trivalent atom is **negatively** charged as it acquires an electron and is called **acceptor** atom or impurity.

Formation of *p* – *n* junction: Part of p-type can be converted into *n* – type by adding pentavalent impurity. There is concentration gradient between *p* and *n* sides, holes diffuse from *p* side to *n* side ($p \rightarrow n$) and electrons move from ($n \rightarrow p$) creating a layer of positive and negative charges on n and p side respectively called **depletion layer**.

Symbol of *p-n* junction diode

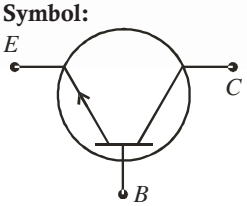


Special purpose *p – n* junction diode:
Zener diode: It is fabricated by heavy doping of *p* and *n* sides of *p – n* junction. Depletion region is thin < 10^{-6} m. Electric field of junction is high ~ 5×10^6 V/m. Reverse bias ~ 5V.
It is used as **voltage regulator**.
p-n junction diode is used as a **rectifier**.
Rectifier is a device which converts A.C. into D.C.
Inverter converts D.C. into A.C.
Optoelectronic junction devices:

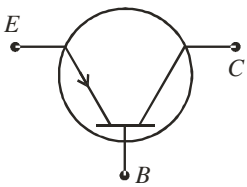
(a) **Photodiode:** It is a *p – n* junction fabricated with a transparent window to allow light photons to fall on it. These photons generate electron hole pairs upon absorption. The generation of electron hole pair is near the junction and due to junction field they remain separated till external load is connected. The electron are collected on *n*–side and holes on *p*–side near junction and give rise to an emf.
When external load is connected, current flows. The magnitude of current depends on intensity of incident radiation.

(b) **Light emitting diode (LED):** It consists of heavily doped *p – n* junction in forward bias. Electrons move from *n* □ *p* and holes from *p* □ *n* (minority carriers). Thus, near junction, minority carrier concentration increases (under no bias it is less) and they combine with majority carriers near the junction to release energy in form of photons with energy equal to or less than band gap energy. As forward bias increases, current increases till light intensity reaches maximum.

Junction Transistor:
Types: (i) *n-p-n* type, (ii) *p-n-p* type.
Structure: (i) Emitter (E), (ii) Base (B), (iii) Collector (C)
Symbol:



n-p-n type



p-n-p type

AC parameters:
(i) Input resistance

$$= \frac{\text{Change in base – emitter voltage}}{\text{Base current}}$$

$$\Rightarrow r_i = \left(\frac{\Delta V_{BE}}{\Delta I_C}\right)_{I_B}$$

$\rightarrow$ dynamic resistance

(ii) Output resistance, r_0

$$= \left(\frac{\Delta V_{CE}}{\Delta I_C}\right)_{I_B}$$

(iii) Current amplification factor (β)

$$\beta_{ac} = \left(\frac{\Delta I_C}{\Delta I_B}\right)_{V_{CE}}$$

$$\beta_{dc} = \frac{I_C}{I_B} \Rightarrow \beta_{ac} \simeq \beta_{dc}$$

Uses of Transistor:
As a switch, an amplifier, an oscillator, etc.

Chemistry

NATURE OF MATTER

- **Substance (or chemical substance):** A "**substance**" is a kind of matter that can not be separated into other kinds of matter by any physical process. e.g. gold, silver, iron, sodium chloride, calcium carbonate etc.
- **Pure substance:** is one that is a *single substance* and has a *uniform composition.* Such a substance always have the *same texture* and *taste.* e.g. water, salt, sugar etc.
- **Testing the purity of a substance:** The purity of substance can easily be checked by checking its melting points in case of a solid substance or by checking its boiling points in case of a liquid substance.
- **Types of pure substances:** Two different types of pure substances are
  - **(i) Element:** An element is a substance which can not be split up into two or more simpler substances by usual chemical methods of applying heat, light or electric energy. e. g. hydrogen, oxygen, sodium, chlorine etc.
  - **(ii) Compound:** A compound is a substance made up of two or more elements chemically combined in a fixed ratio by weight e.g. H_2O (water), NaCl (sodium chloride) etc.
- **Mixture:** A mixture is a substance which consists of two or more elements or compounds not chemically combined together.
- **Types of mixtures:** Mixtures are *impure substances*. They are of two types:
  (i) Homogeneous mixture: It has a uniform composition throughout and its components can not be distinguished visually. e.g. a well mixed sample of vinegar.
  (ii) Heterogeneous mixture: It is one that is not uniform throughout. Different samples of a heterogeneous mixture may have different composition. e.g. a mixture of salt and pepper.
- **Solution:** It is a homogeneous mixture of two or more substances whose composition can be varied. e.g. solution of common salt in water, solution of ammonia in water. Some other examples are lemonade, coke, pepsi etc.
- **Separating the components of a mixture:** Depending upon the type of mixture (i.e. whether it is a homogeneous mixture or heterogeneous mixture) different methods used are given below:

S No.	Mixture	Separation Method
1.	Insoluble solid in solvent	Sedimentation followed by filtration. In case of a fine solid centrifugation is used instead of filtration
2.	Solution of solid in liquid	Evaporation, crystallization, distillation

3.	Miscible mixture of liquids.	Fractional distillation
4.	Immiscible mixture of liquids.	Separating funnel
5.	Mixture of two solids one of which is sublime	Sublimation
6.	Mixture of substances in solution.	Chromatography

- **Solute:** The component of solution that is dissolved and present in smaller quantities in a solution is known as solute.
- **Solvent:** The component of solution in which solute is dissolved is known as solvent. It is always present in larger amount in a solution.
- **Saturated Solution:** A solution in which no more solute can be dissolved at the same temperature is called *saturated solution*.
- **Unsaturated Solution:** It is a solution in which more solute can be dissolved at the same temperature.
- **Super-saturated Solution:** It is a solution which contains more mass of the dissolved solute than the saturated solution at the same temperature and pressure.
- **Concentration of a solution:** *Concentration of a solution* is the amount of solute present in a given amount (mass or volume) of a solution or the amount of solute dissolved in a given mass or volume of a solvent.

$$\text{Concentration} = \frac{\text{Amount of solute}}{\text{Amount of solvent}}$$

- **Solubility:** It is defined as the amount of solute dissolved in 100g of solvent to form a saturated solution.
- **Suspension:** It is a non-homogeneous mixture in which *solids* are *dispersed in liquids*. In it the solute particles do not dissolve but remains suspended through out the bulk of the medium.
- **Colloids or colloidal solution:** Colloid is a *heterogeneous mixture.* The size of particles of a colloid is intermediate between *true solutions* and *suspensions* (i.e between 1nm and 100 nm). The particles of a colloid can not be seen with naked eye.
- **Types of colloidal solution:** Since colloidal solution is heterogeneous mixture it consists of two *phases*. These are
  (i) *dispersed phase* (colloidal particles)
  (ii) *dispersion medium* (The medium in which colloidal particles are dispersed.)
- **Emulsion:** Emulsions are liquid-liquid colloids.
- **Types of Emulsion:** Emulsions are of two types:
  (i) water in oil (ii) oil in water
- **Emulsifiers** are those substances that help in forming stable emulsions of oil and water, e.g. milk, cod-liver oil, cold creams, vanishing creams, moisturising cream, paints, etc.
- **Physical change:** During such a change no new substances is formed and there is no change in the chemical properties of the substances.
- **Chemical change:** Such a change is accompanied by change in chemical properties and formation of new substances.

STRUCTURE OF ATOM

- **Law of conservation of mass:** This law was stated by **Lavoisier** in 1744. It states that *"In all physical and chemical changes, the total mass of reactants is equal to total mass of products."*
- **Law of constant proportions (or constant composition):** This law was first stated by Proust in 1797. According to the law *"a chemical compound is always found to be made up of the same elements combined together in the same proportions by weight"* e.g. the ratio of hydrogen and oxygen in pure water is always 1: 8 by weight. This law is also called law of definite proportions.
- **Law of multiple proportions:** This law was given by **John Dalton (1803)** and states that "when two elements combine to form two or more compounds, the different mass of one of the elements and the fixed mass of the one with which it combines always form a whole number ratio". This law explains the concept of formation of more than one compound by two elements.
- **Dalton's Atomic theory:** *Postulates of Dalton's Atomic Theory*
  (i) Matter is made up of extremely small indivisible particles called **atoms.**
  (ii) Atoms of the same substance are identical in all respects i.e., they possess same *size, shape, mass, chemical properties* etc.
  (iii) Atoms of different substances are different in all respects i.e., they possess different size, shape, mass etc.
  (iv) Atom is the smallest particle that takes part in a chemical reaction.
  (v) Atoms of different elements may combine with each other in a fixed simple, whole number ratio to form **compound atoms.**
  (vi) Atoms can neither be created nor destroyed i.e., atoms are indestructible.
- **Atom:** It is the smallest particle of an element which can take part in a chemical change. It may or may not be capable of independent existence.
- **Symbol:** The abbreviation used for lengthy names of elements are termed as their symbols.
  The symbol of an element is the first letter or the first and another letter of English name or Latin name of the element.
  While writing a symbol, the first letter is always capital and the second is always small.
- **Molecule :** It is the smallest particle of an element or compound that is capable of independent existence land shows all the properties of that substance.
- **Atomicity:** The number of atoms present in a molecule of an element or a compound is known as its atomicity. e.g. the atomicity of oxygen is 2 while atomicity ozone is 3.
- **Formula of simple and molecular compounds**
  Binary compounds are those compounds which are made up of two different elements e.g. NaCl, KBr, CaO etc. Following rules are to be followed for writing the formula.
  (i) The valencies or charges on the ions must be balanced.
  (ii) For a compound made up of a **metal** and a **non-metal** the symbol of metal is written first.

(iii) In compounds formed with polyatomic ions, the ion is enclosed in a bracket before writing the number to indicate the ratio.

- **Valency:** The electrons present in the outermost shell of an atom are known as valence electrons. These electrons determine the valency of an atom.
  Valency is equal to the number of valence electrons.
  In case the number of valence electrons is close to its full capacity. Then,
  Valency = 8 – valence electrons
- **Atomic number (Z):** Atomic number of an element is equal to the number of protons present in the nucleus of an atom.
  Atomic number (Z) = number of protons = number of electrons.
- **Mass number (A):** It refers to the total number of neutrons and protons (i.e., sum of protons and neutrons) called collectively as nucleus, present in an atom.
  Mass number (A) = number of protons + number of neutron
- **Isotopes:** Atoms of the same element having same atomic number but different mass numbers are known as **Isotopes** e.g. $^{35}_{17}Cl$ and $^{36}_{17}Cl$, and $^{1}_{1}H$ and $^{2}_{1}H$, $^{12}_{6}C$ and $^{14}_{6}C$ etc.
- **Applications of Isotopes:** Isotopes are used in various fields. For example.
  (i) Isotope of uranium is used as a fuel in nuclear reactor
  (ii) Isotope of cobalt is used in treatment of cancer
  (iii) Isotope of iodine is used in treatment of goitre.
- **Isobars:** Atoms of different elements having same mass numbers are known as **Isobars**, e.g K-40 and Ar-40
- The discovery of cathode rays was done by **J.J. Thomson** an English physicist.

Sub-atomic Particles:

Electron, proton and *neutron* are subatomic particles.

The credit for discovery of these particles goes to

Electron — J.J. Thomson and **Proton — E. Goldstein**. Another subatomic particle which is neutral and has a mass approx. equal to that of a proton was called neutron and was discovered by chadwick. The neutron is a neutral particle found in the nucleus of an atoms.

Properties of atomic particles (Comparative)

	Particles	Electron	Proton	Neutron
(i)	Symbol	e or e–	p	n
(ii)	Nature	Negatively charged	Positively charged	neutral (no charge)
(iii)	(a) Charge (b) Unit charge	(a) -1.6×10^{-19} C (b) –1	(a) $+1.6 \times 10^{-19}$ C (b) + 1	0 0
(iv)	Mass (a) amu (b) kg	(a) 0.0005486 amu (b) 9.1×10^{-3}1kg	(a) 1.00753 amu (b) 1.67265×10^{-27} kg	(a) 1.00893 amu (b) 1.67495×10^{-27} kg
(v)	Location	Extra nuclear space	nucleus	nucleus
(vi)	Notation	$-1e^0$	$^{1}_{1}P$	$^{1}_{0}n$
(vii)	Relative mass	1/1840	1	1

GENERAL CONCEPTS OF CHEMISTRY

- **Definition**
  Chemistry is a branch of science which deals with study of matter and various changes it undergoes. It deals with the preparation, properties, reactions and structures of chemical elements and compounds.
  For convenience the study of chemistry is sub-divided into various branches such as:
  (i) Inorganic chemistry
  (ii) Organic chemistry
  (iii) Physical chemistry
  (iv) Analytical chemistry
  (v) Industrial chemistry
- **Ions or radicals**
  An **ion** is formed when electrons are removed from or added to an atoms or group of atoms.
  When electron(s) is/are removed the resulting ion is called a **cation or basic radical.** A cation is positively charged ion. (e.g. Na^+).
  When electron(s) is/are added the resulting ion is called an **anion or acidic radicals.** An anion is negatively charged ion (e.g. Cl^-, O_2^{2-})
  An ion or radical is classified as monovalent, divalent, trivalent or tetravalent when the number of charges over it is 1, 2, 3 or 4 respectively.
- **Formula of elements and compounds**
  Formula of elements: The molecule of an element is denoted by writing the symbol of the element and, to the right and below it, a number expressing the number of atoms in the molecule.
  Formula of compound: A molecule of a compound may be made up of atom of different elements linked up together chemically and in definite proportion by weight.
- **Chemical formula:** It is of two types:
  (i) Molecular formulae: Chemical formulae that indicate the actual number and type of atoms in a molecule is called molecular formulae.
  (ii) Empirical formulae: Chemical formulae that indicate only the relative number of atoms of each type in a molecule is called empirical formulae.
- **Equivalent weight**
  (i) Equivalent weight of element

$$= \frac{\text{Molecular mass}}{\text{Basicity of acid / Acidity of base}}$$

  (ii) Eq. wt of an acid/base =

$$\frac{\text{Molecular mass}}{\text{Basicity of acid / Acidity of base}}$$

  (iii) Eq. wt of salts =

$$\frac{\text{Formula mass}}{(\text{Valency of cations})(\text{No. of cations})}$$

- **Expression of strength / concentration of solution**
  (i) Mass percent

$$= \frac{\text{Weight of solute (gm)}}{\text{Weight of solution (gm)}} \times 100$$

  (ii) Normality =

$$\frac{\text{Number of gram equivalents of solute}}{\text{Volume of solution (lit.)}}$$

(iii) Molarity

$$= \frac{\text{Number of gram moles of solute}}{\text{volume of solution (lit.)}}$$

(iv) Molality

$$= \frac{\text{Gram moles of solute}}{\text{Weight of solvent (kg)}}$$

(v) Mole fraction: Mole fraction of solute

$$= X_A = \frac{n_A}{n_A + n_B}$$

Mole fraction of solvent

$$= X_B = \frac{n_B}{n_A + n_B}$$

$$X_A + X_B = 1$$

- **Chemical change:** A chemical change is generally accompanied by a *change of state, change of colour, evolution of a gas or change of temperature* etc.
- **Chemical equation:** The qualitative representation of a chemical reaction in a short hand or concise form in term of symbols and formulae, is called a chemical equation.
- **Skeletal chemical equation or symbol equation:** A chemical equation written in the form of symbols and formulae is called a skeletal chemical equation.
- **Balanced chemical equation:** A chemical equation in which number of atoms of each elements on L.H.S. (i.e. reactants) and R.H.S. (i.e.products) is equal is called a balanced chemical equation.
- **Balancing of chemical equations:** The process of making the number of different elements on both side of the equation equal is known as balancing of chemical equation.
- **Types of chemical reactions**

Various types of chemical reactions are:-

(i) Combination reactions: Combination reactions are those in which one element reacts with another to form a compound.

(ii) Decomposition reactions: Decomposition reactions are those reactions in which a compound breaks down into simpler compounds (or substances). These reactions require energy in the form of heat, light, electricity, etc.

(iii) Simple displacement reaction and simple substitutions: A displacement reaction is a reaction in which an atom, or group of atoms, present in a molecule is displaced by another atom. This type of reaction can be represented as follows:

$$AB + C \longrightarrow AC + B$$

(Compond) (New compound)

(iv) Double displacement reactions or Double decomposition: The reactions in which mutual exchange of radicals takes place are known as double decomposition reactions.

(v) Oxidation-Reduction Reactions

Oxidation: Oxidation is defined as a process which involve addition of oxygen or removal of hydrogen.

Reduction: The term reduction is defined as a process which involve the removal of oxygen or addition of hydrogen.

(vi) Redox reactions: Those reactions in which oxidation and reduction

takes place simultaneously, are known as redox reactions.

Example:

(vii) Exothermic and endothermic reaction: Chemical reactions usually proceed with either liberation of heat or the absorption of heat.

When a chemical reaction liberates heat to the surroundings, it is said to be 'exothermic reaction' and when it absorbs the heat from the surroundings, it is said to be endothermic reaction.

- **Rancidity:** The most important cause of deterioration in fats and fatty foods is oxidation of fats. What we perceive is an unpleasant change in the flavour and odour of a food, called rancidity.

CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

- **Doberiner's law of triads:** According to this law, *"in certain triads (group of three elements) the atomic mass of the central element was the arithmetic mean of the atomic masses of the other two elements."*

  Limitations of Doberiner's Triads: He could identify only a few such triads and so the law could not gain importance. In many traids like in the triad of Fe, Co, Ni, all the three elements have a nearly equal atomic mass and thus does not follow the above law.

- **Newland's law of octaves:** According to this law *"the elements are arranged in such a way that the eighth element starting from a given one has properties which are a repetition of those of the first if arranged in order of increasing atomic weight like the eight note of musical scale."*

  Drawback of Newland's law of octaves:

  (i) According to Newland only 56 elements exists in nature and no more elements would be discovered in the future. But later on several new element were discovered whose properties did not fit into law of octaves.

  (ii) In order to fit new elements into his table Newland adjust two elements in the same column, but put some unlike elements under the same column.

  Thus, Newland's classification was not accepted.

- **Mendeleev's periodic table:** Mendeleev arranged 63 elements known at that time in the periodic table. According to Mendeleev *"the properties of the elements are a periodic function of their atomic masses."* The table consists of eight vertical column called *'groups'* and horizontal rows called *'periods'*.

  Merits of Mendeleev's periodic table:

  (i) At some places the order of atomic weight was changed in order to justify the chemical and physical nature.

  (ii) Mendeleev left some gap for new elements which were not discovered at that time.

  (iii) One of the strengths of Mendeleev's periodic table was that, when inert gases

were discovered they could be placed in a new group without disturbing the existing order.

Characteristics of the periodic table:

Its main characteristics are:

(i) In the periodic table, the elements are arranged in vertical rows called **groups** and horizontal rows called **periods**.

(ii) There are **eight groups** indicated by Roman Numerals I, II, III, IV, V, VI, VII, VIII. The elements belonging to first seven groups have been divided into **sub-groups** designated as **A** and **B** on the basis of similarities. Group VIII consists of nine elements arranged in **three triads.**

(iii) There are **six periods** (numbered 1, 2, 3, 4, 5 and 6). In order to accomodate more elements, the periods 4, 5, 6 are divided into two halves. The first half of the elements are placed in the upper left corners and the second half occupy lower right corners in each box.

Achievements of Mendeleev's periodic table

(i) The arrangement of elements in groups and periods *made the study of elements quite systematic*

(ii) **Prediction of new elements and their properties:** Many gaps were left in this table for undiscovered elements. The elements *silicon, gallium* and *germanium* were discovered in this manner.

(iii) **Correction of doubtful atomic masses:** Mendeleev corrected the atomic masses of certain elements with the help of their expected positions and properties.

Limitations of Mendeleev's classification:

(i) He could not assign a correct position of hydrogen in his periodic table, as the properties of hydrogen resembles both with alkali metals as well as with halogens.

(ii) The isotopes of the same element will be given different position if atomic number is taken as basis, which will disturb the symmetry of the periodic table.

(iii) The atomic masses do not increases in a regular manner in going from one elements to the next. So it was not possible to predict how many elements could be discovered between two elements.

- **Modern periodic law:** This law was given by **Henry Moseley** in 1913. It states, *"Properties of the elements are the periodic function of their atomic numbers".*

  Cause of periodicity: *Periodicity* may be defined as the *repetition of the similar properties of the elements placed in a group and separated by certain definite gap of atomic numbers.*

- **Modern periodic table**

  Moseley proposed this modern periodic table and according to which *"the physical and chemical properties of elements are periodic function of their atomic number and not the atomic weight."*

  (i) The modern periodic table has 18 vertical columns called *"groups"* and seven horizontal rows called *"periods"*. The groups have been numbered 1, 2, 3.....18 from left to right.

  (ii) The elements belonging to a particular group make a family and usually named after the first member. In a group all the elements contain the same number of valence electrons.

(iii) In a period all the elements contain the same number of shells, but as we move from left to right the number of valence shell electrons increases by one unit.

The maximum number of electrons that can be accommodated in a shell can be calculated by the formula $2n^2$ where n is the number of the given shell from the nucleus.

- **Trends in modern periodic table:** The trends observed in some important properties of the elements in moving down the group (from top to bottom of the table) and across a period (from left to right in a period) are discussed below:

(i) Valency: Valency may be defined as *"the combining capacity of the atom of an element with atoms of other elements in order to acquire the stable configuration (i.e. 8 electron in valence shell. In some special cases it is 2 electrons)."*

(ii) Atomic size: It refers to the distance between the centre of nucleus of an isolated atom to its outermost shell containing electrons.

The atomic radius decreases on moving from left to right along a period. This is due to an increase in nuclear charge which tends to pull the electrons closer to the nucleus and reduces the size of the atom.

In a group atomic size decreases from top to bottom due to increase in number of shells.

(iii) Metallic and non-metallic properties: In a period from left to right metallic nature decreases while non-metallic character increases.

In a group metallic character increases from top to bottom while non-metallic character decrease.

(iv) Electronegativity: The relative tendency of an atom to attract the shared pair of electrons towards itself is called **electronegativity.**

In a period from left to right, the value of electronegativity increases while in a group from top to bottom the value of electronegativity decreases.

ACIDS, BASES AND SALTS

- **Acids and Bases:** The term acid, in fact, comes from the latin term acere, which means "Sour". In everyday life we come across many compounds that chemists classify as acids.

  Bases are compounds which taste bitter eg. milk of magnesia.

- **Properties of acids and bases**

A. Properties of acids

Chemical properties:

(i) **Action of metals**

Metal + Acid → Salt + Hydrogen

(ii) **Action with metal oxides (Basic oxides)**

Basic oxide + Acid → Salt + Water (neutralisation reaction)

(iii) **Action with metal carbonates and metal hydrogen carbonates**

Carbonate/bicarbonate + Acid → Salt + water + carbon dioxide.

B. Properties of bases

Chemical Properties:

(i) **Reaction of metals with bases:** Metals (e.g. Zn, Al, Sn) dissolve in NaOH (an alkali) to liberate hydrogen gas.

(ii) **Action with acids:** It is a *neutralisation reaction*.

Base + Acid → Salt + Water

Non - metallic oxides react in the same way hence *non-metallic oxides are acidic in nature.*

- **Strength of Acids and Bases**

The strength of an acid or a base can be easily estimated by making use of **universal indicator** which is a *mixture of several indicators*. The universal indicator show different colours at different concentrations of hydrogen ions in solution.

- **pH Scale:** It is a scale that is used for measuring H^+ ion (hydrogen ion) concentration of a solution.

The term pH stands for "potential" of "hydrogen". It is *the amount of hydrogen ions in a particular solution*.

For acids pH < 7

For bases pH > 7

For neutral substances pH = 7

- **Importance of pH in Daily Life**

(i) **Blood pH:** For proper functioning our body needs to maintain blood pH between 7.35 and 7.45. Values of blood pH greater than 7.8 or less than 6.8 often results in death.

(ii) **Acid rain:** When pH of rain water is less than 5.6, it is called acid rain, when acid rain flows into rivers, it lowers the pH of river water.

(iii) **pH in our digestive system:** We know that hydrochloric acid (HCl) produced in our stomach helps in digestion of food without harming stomach. However excess of acid causes indigestion and leads to pain as well as irritation. To get rid of this people use bases called "antacids".

(iv) **pH of the soil:** For their healthy growth plants require a specific pH. Soils with high peat content or iron minerals or with rotting vegetation tend to become acidic and the soil pH can reach as low as 4.

(v) **pH change as the cause of tooth decay:** Tooth decay starts when the pH of mouth is lower than 5.5

- **Salts:** A **salt** is an *ionic compound* which dissociates to yield a positive ion other than hydrogen ion (H^+) and negative ion other than hydroxyl ion (OH^-) e.g. NaCl

Salts are formed by the reaction of acid and base which is also known as neutralisation.

(i) **Sodium hydroxide (NaOH) or Caustic soda:** It is prepared on commercial scale by the electrolysis of strong solution of sodium chloride (NaCl) also called brine. The process is called chlor-alkali process.

The overall reaction taking place is:

$2NaCl(aq) + 2\ H_2O(l) \rightarrow H_2(g) + Cl_2(g) + 2NaOH(aq)$

Uses:

(a) Sodium hydroxide is most used base in the laboratory.

(b) It is used in many industries, mostly as strong chemical base

in manufacture of pulp and paper, textiles, drinking water, soap and detergents etc.

(ii) **Baking soda, Sodium hydrogen carbonate, ($NaHCO_3$)**

$NaCl + H_2O + CO_2 + NH_3 \rightarrow NH_4Cl + NaHCO_3$

When heated the following reaction occurs

$$2NaHCO_3 \xrightarrow{\text{Heat}} Na_2CO_3 + H_2O + CO_2$$

The above reaction occurs when baking soda is heated during cooking.

Uses:

(a) **In baking powder:** The most practical use of baking soda is as a *leavening agent* in baking.

(b) **As an antacid:** Baking soda reacts with acid due to its alkaline nature and neutralizes acidity (i.e. acts as an antacid)

(c) **In fire extinguishers:** It is used in *soda-acid fire extinguisher.*

(iii) **Washing soda, $Na_2CO_3 . 10H_2O$, Sodium carbonate**

Sodium carbonate can be obtained by heating baking soda; recrystallisation of sodium carbonate gives washing soda. It is also a basic salt.

$$Na_2CO_3 + 10H_2O \longrightarrow \underset{\text{Hydrated Sodium Carbonate (Washing Soda)}}{Na_2CO_3 \cdot 10H_2O}$$

(sodium carbonate)

Uses:

(a) Sodium carbonate (washing soda) is used in glass, soap and paper industries.

(b) It is used for removing permanent hardness of water.

(iv) **Bleaching powder:**

Calcium hypochlorite is a chemical compound with formula $CaOCl_2$. It is a yellowish powder with smell of chlorine. It is widely used for water treatment and as a bleaching agent (bleaching powder)

$2Ca(OH)_2 + 2Cl_2 \rightarrow CaOCl_2 + CaCl_2 + 2H_2O$

Calcium hypochlorite is used for the disinfection of drinking water or swimming pool water.

(v) **Plaster of Paris, $CaSO_4 . 1/2\ H_2O$**

It can be obtained by heating gypsum ($CaSO_4 . 2H_2O$)

$$(CaSO_4 . 2H_2O + \text{heat} \rightarrow \left(CaSO_4 . \frac{1}{2}H_2O\right) + \frac{3}{2}H_2O$$

Plaster of paris is a white powder and on mixing with water it changes to gypsum once again giving a hard solid mass

$$CaSO_4 \bullet \frac{1}{2}H_2O + 1\frac{1}{2}H_2O \rightarrow CaSO_4 . 2H_2O$$

Uses: It is used

(a) for making moulds or casts for toys, pottery, cermics etc.

(b) in surgical bandages for setting fractured bones.

METALS AND NON-METALS

- **Metals and Non-metals:** There are more than 114 elements present in the periodic table. These elements can be broadly classified into two categories i.e., metals and non-metals. Out of 114 elements, 22 are non-metals.
- **Physical properties of metals:**
  (i) They are usually shiny i.e. have a metallic luster.
  (ii) Metals have a high density
  (iii) Metals are ductile i.e. they can be drawn into wires.
  (iv) Metals are malleable i.e. they can be founded into thin sheets.
  (v) Metals are good conductors of electricity.
  (vi) Metals have high melting point and are generally in solid state at room temperature.
  (vii) Metals are good conductors of heat and sound.
- **Uses of metals:**
  Metals are used in manufacturing of bridges, railways, aeroplanes, diesel mobile units (DMU), electric mobile units (EMU), motor cars, electric motors, telephones, televisions, interplanetary space vehicles, or even common articles like cooking utensils and coins. Metals are very important for the economy of a country. Some metals, such as titanium, chromium, manganese and zirconium are strategic metals. These metals and their alloys find wide applications in atomic energy, space science projects, jet engines and high grade steels. Gold and silver ornaments are obtained from small pieces of metals by hammering.
- **Noble metal:** Noble metals are metals that are resistant to corrosion or oxidation, unlike most base metals. Examples include tantalum, gold, platinum, and rhodium.
- **Precious metal:** A precious metal is a rare metallic chemical element of high economic value precious metals include the platinum group metals: ruthenium, rhodium, palladium, osmium, iridium, and platinum, of which platinum is the most widely traded.
- **Alloy:** An alloy is a mixture of two or more elements in solid solution in which the major component is a metal. Combining different ratios of metals as alloys modify the properties of pure metals to produce desirable characteristics.

	Alloy	Composition	Uses
1	Brass	Cu = 80%, Zn = 20%	For making utensils and cartridges.
2	Bronze	Cu = 90%, Sn = 10%	For making statues, medals, ships, coins and machines
3	Solder	Sn = 50%, Pb = 50%	For joining metals, solding wire and electronic components etc.

4	Duralumin	Al = 95.5%, Cu = 3%, Mn = 1.0%, Mg = 0.5%	Used in bodies of aircrafts, kitchen ware and automobile parts etc.
5	German Silver	Cu = 60%, Zn = 20%, Ni = 20%	For making utensils and ornaments
6	Gun metal	Cu = 90%, Sn = 10%	For gears and castings etc.
7	Bell metal	Cu = 80%, Sn = 20%	For bells, gangs etc.
8	Magnalium	Al = 90%, Mg = 10%	For balance beams, light instruments.
9	Type metal	Pb = 82%, Sb = 15%, Sn = 3%	For casting type
10	Stainless steel	Fe, Ni, Cr, C	For utensils, cutlery etc.

- **Physical properties of non-metals:**
  (i) They are dull, however diamond, graphite and iodine are lustrous.
  (ii) They are poor conductors of heat and electricity. Graphite is a good conductor.
  (iii) They are weak and brittle (they easily break or shatter).
  (iv) They have a low density (they feel light for their size).
  (v) They do not make a ringing sound when they are hit.
  (vi) Melting points and boiling points are usually low.
  (vii) Non-metals are usually soft. (Diamond is an exception, it is quite hard. It is a crystalline solid).
  (viii) They exist in allotropic forms.

8. Uses of Non-Metals
(i) Oxygen is essential for survival of life.
(ii) Hydrogen is used to convert vegetable oil into vegetable ghee by hydrogenation.
(iii) Nitrogen is used to preserve food and for manufacturing proteins by plants.
(iv) Carbon in the form of diamond is used for cutting rocks and in the form of graphite as electrode and in manufacturing of lead pencils.
(v) Sulphur is used in vulcanization of rubber, as fungicide and in manufacture of dyes, gun powder etc.
(vi) Chlorine is used as water disinfectant and in the manufacture of pesticides like gammaxene.

- **Extraction of Metals**
  (i) **Minerals:** The natural substance in which the metals or their compounds occur in the earth is called minerals.
  (ii) **Ores:** The minerals from which the metals can be conveniently and economically extracted are called ores.
  (iii) **Native ores:** These ores contain metals in the free state, *e.g.*, silver, gold, platinum, etc.
  (iv) **Metallurgy:** The whole process of obtaining a pure metal from one of its ore is known as metallurgy.
  (v) **Gangue or matrix:** Ores usually contain soil, sand,

stones and others useless silicates. These undesired impurities present in ores are called gangue or matrix.

(vi) The removal of unwanted earthy and silicious impurities from the ore is called **ore-dressing or concentration of ores** and the process used to concentrate an ore is called the **benefication process**.

(vii) Concentration of ore is achieved by

(1) **Physical methods:**

(a) **Hand-picking:** It is used in the case when the impurities are quite distinct from the ore so that these may be differentiated by naked eye.

(b) **Hydraulic washing or Levigation or Gravity separation:** The separation is based on the difference in the specific gravities of the gangue particles and the ore particles.

(c) **Electromagnetic separation:** When one component either the ore or impurity is magnetic in nature, this method can be used for separation.

(d) **Froth floatation process:** This method is used for the concentration of sulphide ores.

(2) **Chemical method (Leaching)** involves the treatment of the ore with a suitable reagent as to make it soluble while impurities remain insoluble. The ore is recovered from the solution by suitable chemical method.

(viii) **Extraction** process used to obtain metals in free state from concentrated ores is called extraction.

(ix) **Extraction of crude metal from the concentrated ore involves following chemical processes.**

(a) **Conversion of ore into metallic oxides.**

- Calcination involves heating the ore below its fusion temperature in the absence of air. It can remove moisture from hydrated oxide or CO_2 from carbonates. It makes the ore porous.
- Roasting is the heating of the ore in the presence of air below its fusion temperature.

(b) **Reduction to free metal:**

- **Smelting:** This involves the reduction of the ore to the molten metal at a high temperature. For the extraction of electropositive metals such as Pb, Fe, Sn, powerful reducing agent like C, H_2, CO, Al, Mg, etc., are used.
- **Self reduction process:** These processes are also called auto-reduction process.
- **Electrolytic process:** The oxides of

highly electropositive metals like Na, K, Mg, Ca, Al, etc., are extracted by electrolysis of their oxides, hydroxides or chlorides in fused state. For example, Al is obtained by the electrolysis of alumina mixed with cryolite.

(x) **Refining** is the process of purifying the extracted metals.

(xi) **Chromatography** is based on the principle that the different components of a mixture are adsorbed to different extents on an adsorbent.

S. no.	Name of the ore	Formula of the ore	Types of ore	Metal obtained from the ore
1	Bauxite	$Al_2O_3.2H_2O$	Oxide	Aluminium (Al)
2.	Haematite	Fe_2O_3	Oxide	Iron (Fe)
3.	Magnetite	Fe_2O_4	Oxide	Iron (Fe)
4.	Zincite	ZnO	Oxide	Zinc (Zn)
5.	Cuprite	Cu_2O	Oxide	Copper (Cu)
6.	Litharge	PbO	Oxide	Lead (Pb)
7.	Malachite	$CuCO_3.Cu(OH)_2$	Carbonate	Copper (Cu)
8.	Magnesite	$MgCO_3$	Carbonate	Magnesium (Mg)
9.	Lime stone	$CaCO_3$	Carbonate	Calcium (Ca)
10.	Cinnabar	HgS	Sulphide	Mercury (Hg)
11.	Chalcopyrite	$CuFeS_2$	Sulphide	Copper (Cu)
12.	Zinc blende	ZnS	Sulphide	Zinc (Zn)
13.	Galena	PbS	Sulphide	Lead (Pb)
14.	Common salt	NaCl	Chloride (Halide)	Sodium (Na)
15.	Fluorspar	CaF_2	Fluoride (Halide)	Calcium (Ca)
16.	Horn silver	AgCl	Chloride (Halide)	Silver (Ag)
17.	Chalcocite	Cu_2S	Sulphide	Copper (Cu)

- **Corrosion of Metals:** Corrosion is an oxidation reaction with atmospheric oxygen in the presence of water on the surface of a metal. Rusting is

$$Fe(s) + \frac{3}{2}O_2(g) + xH_2O(l) \rightarrow Fe_2O_3.xH_2O(s)$$

  i.e., rust is hydrated iron (III) oxide.

- **Prevention of Corrosion:** Iron and steel (alloy of iron) are most easily protected by paint which provides a barrier between the metal and air/water. Moving parts on machines can be protected by a water repellent oil or grease layer. Other important methods are

  (i) Alloying: Iron or steel along with other metals can also be protected by 'alloying' or mixing with other metals

(e.g., chromium) to make non-rusting alloys.

(ii) Galvanizing: Coating iron or steel with a thin zinc layer is called 'galvanizing'.

- **Purity of Gold:**
  24-Carat gold: The carat (abbreviation ct or Kt) is a measure of the purity of gold alloys. Carat is used to refer to the measure of mass for gemstones.

ENVIRONMENTAL POLLUTION

- The pollutants may be inorganic, biological or radiological in nature.
  (i) Bio-degradable pollutants are domestic wastes which are rapidly decomposed by micro-organisms.
  (ii) Non-biodegradable pollutants include chemicals, mercuric salts, lead compounds, pesticides, etc.
  (iii) Natural pollution is caused by radioactive substances, volcanic eruptions, forests and mines fires floods, etc.
  (iv) Artificial pollution is caused by industries, thermal plants, automobile, exhausts, sewage, etc.
- **Environment:** The conditions existing around animal or human life.
  Atmosphere: The gaseous envelop surrounding the earth. It has been classified into following regions:-
  (i) Stratosphere: The layer of the earth's atmosphere above the troposphere and below the mesosphere.
  (ii) Troposphere: The lowest region of the atmosphere extending from earth's surface to the lower boundary of the stratosphere. In this region, human beings along with other organisms live. It contains water vapour and is greatly affected by air pollution.

  Note: The other two layers are Thermosphere and Mesosphere.
- **Air pollution:** The major air pollutants are
  (i) **Carbon monoxide (CO):** It is produced by incomplete combustion of gasoline in motor vehicles, wood, coal, inceneration and forest fires. It is treacherous and deadly poisonous gas. It induces headache, visual difficulty coma and death. It blocks the normal transport of oxygen from the lungs to other parts of the body.
  (ii) **Sulphur dioxide (SO_2):** It is produced by petrol combustion, coal combustion, petrol refining and smelting operations.
  It hinders the movement of air in and out of lungs. It is particularly poisonous to trees causing chlorosis and dwarfing. In presence of air it is oxidised to which is also irritant.
  $2SO_2 + O_2$ (air) $\rightarrow 2SO_3$
  In presence of moisture is converted into highly corrosive sulphuric acid.
  $SO_3 + H_2O$ (moisture) $\rightarrow H_2SO_4$
  It attacks marble, limestone, vegetation, paper and textiles and injurious to human beings.

(iii) **Oxides of nitrogen:** and NO, Source - combustion of coal, gasoline, natural gas, petroleum refining, chemical plants, manufacturing explosives and fertilizers, tobacco smoke.

Breathing NO_2 causes chlorosis to plants and chronic lung conditions leading to death. reacts with moisture to form acids.

$2NO_2 + H_2O \rightarrow HNO_2 + HNO_3$

$3HNO_2 \rightarrow 2NO + HNO_3 + H_2O$

(iv) **Smoke, dust:**

Sources: cement works, iron and steel works, gas works, power generating stations.

Smog: It is a mixture of smoke and fog in suspended droplet form. It is of two types:

(a) **London smog or classical smog:** It is coal smoke plus fog. The fog part is mainly SO_2 and SO_3. It has sulphuric acid aerosol. It causes bronchial irritation and acid rain. It is reducing in nature.

(b) **Photochemical smog or Los Angeles smog:** The oxidised hydrocarbons and ozone in presence of humidity cause photochemical smog.

Hydrocarbons + O_2, NO_2, NO, O, $O_3 \rightarrow$ Per-oxides, formaldehyde, peroxyacetylnitrate (PAN), acrolein etc.

It is oxidising in nature and causes irritation to eyes, lungs, nose, asthamatic attack and damage plants.

Acid rain: The oxides of C, N and S present in the atmosphere, dissolve in water and produce acids and lower the pH of water below 5.5.

The acids are toxic to vegetation, react with marble and damage buildings.

$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 + H_2O + CO_2$

Acids corrode water pipes and produce salts with heavy metals ions viz Cu, Pb, Hg and Al toxic in nature.

(v) **Green House effect:** The retention of heat by the earth and atmosphere from the sun and its prevention to escape into the outer space is known as green house effect.

Global warming is average increase in the temperature of earth due to increase in concentration of green house gases (CO_2, O_3, NO_x etc).

Consequences of global warming:

(i) Global warming would result in rise in sea level due to increased rate of melting of glaciers and floods.

(ii) Increase in infectious diseases like malaria, dengue, etc.

(vi) **Ozone layer and its depletion:** The ozone

layer, existing between 20 to 35 km above the earth's surface, shield the earth from the harmful U. V. radiations from the sun. The U. V. radiations cause skin cancer, cataract of eye, and harm to vegetation.

Depletion of ozone is caused by oxides of nitrogen

$N_2O + h\upsilon \rightarrow NO + N$

reactive nitric oxide

$NO + O_3 \rightarrow NO_2 + O_2$,

$O_3 + h\upsilon \rightarrow O_2 + O$,

$NO_2 + O \rightarrow NO + O_2$

$2O_3 + h\upsilon \rightarrow 3O_2$ (Net reaction)

The presence of chlorofluorocarbons also increase the decomposition of O_3.

$CF_2Cl_2 + h\upsilon \rightarrow + CF_2Cl + Cl$

$CFCl_3 + h\upsilon \rightarrow CFCl_3 + Cl$,

$Cl + O_3 \rightarrow ClO + O$,

$ClO + O \rightarrow Cl + O_2$

$O_3 + O \rightarrow O_2$ (Net reaction)

(vii) **Control of air pollution:** It can be controlled by

1. Dissolving HCl, HF, in water and , , in alkaline solution.
2. Adsorbing gas and liquid molecules over activated charcoal and silica gel.
3. Chemical reactions.
4. Use of precipitators to settle charge particles.
5. Use of settling chambers under the action of gravity.
6. Use of natural gas in place of diesel, petrol, etc.

- **Water pollution:** The contamination of water by foreign substances which would constitute a health hazard and make it harmful for all purposes (domestic, industrial or agriculture etc.) is known as water pollution. The polluted water may have offensive odour, bad taste, unpleasant colour, murky oily, etc.

(i) **Sources of water pollution**

(a) Domestic sewage: Discharges from kitchens, baths, lavatories, etc.

(b) Industrial waters: Wastes from manufacturing processes which includes acids, alkalines, pesticides, insecticides, metals like copper, zinc, lead, mercury, fungicides, etc.

(c) Oil: from oil spills or washings of automobiles.

(d) Atomic explosion and processing of radioactive materials.

(e) Suspended particles (organic or inorganic) viruses, bacterias, algae, protozoa, etc.

(f) Wastes from fertilizer plants such as phosphates, nitrates ammonia, etc.

(g) Clay: Ores, minerals, fine particles of soil.

(ii) **Aerobic and anaerobic oxidation:** The oxidation of organic compounds present in sewage in presence of good amount of dissolved or free oxygen (approx. 8.5 ml/*l*) by aerobic bacterials is called *aerobic oxidation.* When dissolved or free oxygen is below a certain value the sewage is called *stale.* Anaerobic bacterias

bring out putrefaction producing H_2S, NH_3, CH_4, $(NH_4)_2S$, etc. This type of oxidation is called *anaerobic* oxidation.

(iii) **Biological Oxygen Demand (BOD):** It is defined as the amount of free oxygen required for biological oxidation of the organic matter by aerobic conditions at 20°C for a period of five days. Its unit is mg/*l* or ppm. An average sewage has BOD of 100 to 150 mg/*l*.

(iv) **Chemical Oxygen Demand (COD):** It is a measure of all types of oxidisable impurities present in the sewage. COD values are higher than BOD values.

- **Soil pollution:** The addition of substances in an indefinite proportion changing the productivity of the soil is known as soil or land pollution.

Sources of soil pollution:

(i) Agricultural pollutants: Chemicals like pesticides, fertilizers, bacteriacides, fumigants, insecticides, herbicides, fungicides.
(ii) Domestic refuge and industrial wastes.
(iii) Radioactive wastes from research centres, and hospitals.
(iv) Soil conditioners containing toxic metals like Hg, Pb, As, Cd, etc.
(v) Farm wastes from poultries, dairies and piggery farms.
(vi) Improper disposal of human and animal extreta.
(vii) Pollutants present in air from chemical works.

SOME IMPORTANT MAN MADE MATERIALS

- **Glass**

It consists of a mixture of two or more silicates.

Preparation of glass:

Common glass (or soft glass): It is used to make bottles, glass wares etc. and is obtained by heating together silica (in the form of sand), sodium carbonate or sodium sulphate and chalk or lime stone (calcium carbonate). Some broken glass and a little coke are usually added. The glass so prepared consists of silicates of sodium and calcium.

$$Na_2CO_3(s) + SiO_2(s) \xrightarrow[\text{(silica)}]{} Na_2SiO_3(s) + CO_2(g)$$

$$Na_2SO_4(s) + SiO_2(s) \rightarrow Na_2SiO_3(s) + SO_3(g)$$

$$CaCO_3(s) + SiO_2(s) \rightarrow CaSiO_3(s) + CO_2(g)$$

Hard glass: For preparation of hard glass K_2CO_3 is used in place of Na_2CO_3. It consists of a mixture of calcium and potassium silicates.

Physical properties of glass: Hard, rigid, high viscosity, bad conductor of heat and electricity, brittle, etc.

Blowing: It is a method to cast the molten glass into different moulds. There are two different methods of glass blowing

(i) Free blowing and (ii) mould blowing

Free blowing: It involves the blowing of air to inflate the molten glass which is gathered at one end of the blow pipe to give the desired shape.

Mould blowing: This method was developed after the technique of free blowing. In this method, molten glass is inflated into a wooden or metal carved mould with the help of blow pipe which gives the molten glass the shape and design of the interior of the mould.

Chemical properties of glass

(i) It is resistant to action of air and acids except hydroflouric acid.
(ii) It is alkaline in nature.
(iii) It slowly reacts with water to form alkaline solution.

Types of glass

(i) **Silica glass:** For this type of glass the raw material used is 100% pure form of *quartz*. It is quite *expensive*. It is used in the manufacture of laboratory apparatus. It has low thermal expansion. Its softening point is very high and it is resistant to a wide variety of chemicals.
(ii) **Alkali silicate glass:** For it the raw materials used are sand and soda. It is also called water glass because it is soluble in water and used only as a solution. It is generally used to make gums and adhesives.
(iii) **Lead glass:** For this type of glass lead oxide is added to ordinary glass. The addition of lead oxide increases the density and also the refractive index. This type of glass is used for the manufacture of ornamental glass ware, decorative articles etc.
(iv) **Optical glass:** This type of glass is used in the manufacture of optical instruments like binoculars, spectacles, lenses, prisons, telescopes, microscopes etc. It is transparent and can be grounded into the required shape. It generally contains phosphorus, and lead silicates with little cerium oxide which absorbs UV radiations.
(v) **Processed glass:** The properties and applications of glass also depend upon the processing of glass. Some types of processed glass and their applications are given here:

	Processed glass	Applications
1.	Laminated glass	Used for doors and windows of automobiles. (It has high strength).
2.	Fibre glass	Used for reinforcing purpose (It has enough tensile strength)
3.	Foam glass	Used for civil construction and insulation purposes (it is light weight).
4.	Opaque glass	In it non-transparent glass filters the light entering into it. Thus provides an aesthetic look.

(vi) Borosilicate glass: It contains silica and Boron oxide and small amount of oxides of sodium and aluminium. It is resistant to a wide variety of chemicals due to this property it is used in the manufacture of laboratory ware.

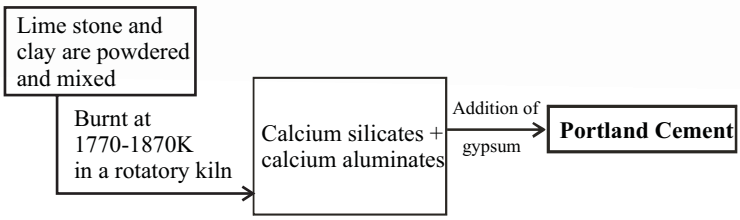
- **Fertilizers**
  Fertilizers are chemical compounds which when added to the soil increase their fertility and directly supply the need of essential elements [N, P, K] of primary importance.
  Classification: Chemical fertilizers are broadly classified into the following three types:
  (i) **Nitrogenous fertilizers:** Ammonium sulphate, urea etc.
  (ii) **Phosphatic fertilizers:** Super phosphate, ammonium phosphate
  (iii) **Potash fertilizers:** Potassium chloride, potassium sulphate.
- **Soaps and detergents**
  Soap: Fatty acid salts of sodium and potassium are known as soaps. These are prepared by the action of fatty acids with sodium hydroxide or potassium hydroxide.
  Fatty acid + sodium hydroxide → Soap + glycerol.
  Detergents are sodium salt of long chain sulphonic acids or alkyl hydrogen sulphate.
  Advantages of detergents over soaps
  (i) Detergents can be used for laundering even with hard water as they are soluble even in hard water.
  (ii) Detergents possess better cleansing properties than soaps.
  Disadvantages of detergents over soap: Detergents are prepared from hydrocarbons, while soaps are prepared from edible fatty oils. Thus they are non biodegradable.
  Saponification: It is the process of making of soap by the hydrolysis of fats and oils with alkalis.
  Both soaps and detergents are soluble in water and act as surfactants which reduce the surface tension of water to a great extent. This increases the water - fabric interaction as a consequence of which dirt particles, grease spots etc are washed away effectively. In other words soaps and detergents enhance the cleansing action of water.
- **Portland cement:** It was first discovered in England. It is essentially a mixture of lime stone and clay. It was called Portland cement because in presence of water it sets to a hard stone-like mass resembling with the famous Portland rock. The approximate composition of Portland cement is

Calcium oxide (CaO)	62%
Silica (SiO_2)	22%
Alumina ($Al2O_3$)	7.5%
Magnesia (MgO)	2.5%
Ferric oxide (Fe_2O_3)	2.5%

  The above compounds are provided by the two raw materials, namely lime stone (which provides CaO) and clay (which provides SiO_2, Al2O3 and Fe_2O_3). In cement, almost entire amount of lime in present in the combined state as calcium silicate (2CaO. SiO_2 and 3CaO. SiO_2) and calcium aluminates (3CaO. Al_2O_3 and 4 CaO. Al_2O_3).
  (i) Cement containing excess amount of lime cracks during setting; while cement containing less amount of lime is weak in strength.
  (ii) Cement with excess of silica is slow-setting and that having an excess of alumina is quick-setting.

(iii) Cement containing no iron is white but hard to burn.

Cement is manufactured by two processes, viz. wet and dry. A small amount (2–3%) of gypsum is added to slow down the setting of the cement so that it gets sufficiently hardened. Setting of cement is an exothermic process and involves hydration of calcium aluminates and calcium silicates.



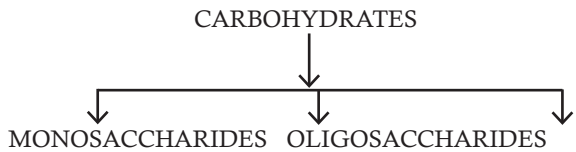
GENERAL ORGANIC CHEMISTRY

CARBOHYDRATES

Carbohydrates are defined as the optically active polyhydroxy aldehydes or ketones or substances which yield these on hydrolysis.

Classification of Carbohydrates

Based on Molecular Size



Based on Nature

Carbohydrates are also classified as reducing and non-reducing sugars depending on whether they reduce Fehlings and Tollen's reagent or not.

Based on Taste

Carbohydrates with sweet taste are called sugars while those without a sweet taste are called non-sugars.

LIPIDS

Lipids are organic compounds soluble in non-polar fat solvents such as acetone, ether, chloroform, benzene, etc. and insoluble in water. The most important role of lipids is that of biological fuel. Lipids supply more energy than carbohydrates, excess of lipids is stored in the body and used at the time of starvation.

PROTEINS

Proteins are highly complex, natural compounds, composed of a large number of different α–amino acids joined together with peptide linkage, i.e., they are naturally occurring polypeptides. The biological importance of proteins can be judge by the fact that the animals can live for a long time without fat or carbohydrate, but not without protein.

NUCLEIC ACIDS

Nucleic acids are colourless, complex, amorphous, compounds made up of three units: bases, sugar and phosphoric acid. These are macro-molecules of high molecular weight and are present in every living cell.

Life Science

CELL BIOLOGY AND GENETICS

Cell is a basic structural and functional unit of life.

- **Robert Hooke** in 1665 coined the word 'cell'.
- **Anton von Leeuwenhoek** first saw and described a live cell.
- **Robert Brown** later had discovered the nucleus.
- Cell theory was proposed by Schleiden and Schwann in 1855 to explain the concept of the cellular nature of living organism.

Prokaryotic Cells

- Prokaryotic cells are morphologically most primitive.
- Prokaryotic cells are devoid of membrane bound organelles like plastids, mitochondria and advanced (9+2) flagella.
- Prokaryotic cells are represented by bacteria, cyanobacteria (blue green algae) mycoplasma and PPLO (pleuro-pneumonia like organisms).

Eukaryotic Cells

- A eukaryotic cell consists of the following components:

Cell Wall

- The cell wall is a non-living, semi-rigid, external protective covering of the cell.
- Cell wall is entirely lacking in animals.
- It is made up of cellulose secreted by the cell itself.

Cell Mebrane

- The cell membrane is a living, thin, elastic and semi-permeable membranous covering of plant and animal cells.

Fluid mosaic model of plasma membrane

- S.J.Singer and G. Nicolson in 1972 proposed the most accepted model of membrane structure. The plasma membrane is a lipid-bilayer with proteins embedded in it.
- Lipids are amphipathic, i.e., they are structurally asymmetric with polar hydrophilic and non-polar hydrophobic group.
- One of the most important function of plasma membrane is the transport of the molecules across it.

Endoplasmic Reticulum (ER)

There are two types of endoplasmic reticulum i.e.,

- **Smooth or agranular ER** – They do not have attached ribosomes on their surface.
- **Rough or granular ER** – They bear ribosomes on their surface, for protein synthesis.

Golgi Apparatus

- Golgi apparatus or Golgi complex is a stack of flattened, membrane bounded, parallely arranged organelles that occur in the association of endoplasmic reticulum in the cytoplasmic matrix.
- The golgi apparatus principally performs the function of packaging materials to be delivered either to the intra-cellular targets or secreted outside the cell.

Lysosomes

- Lysosomes are popularly called "suicide bags".

Vacuoles

- In plant cells, the vacuoles can occupy up to 90 percent of the volume of the cell. The vacuole is bound by a single membrane called tonoplast. They are responsible for maintenance of turgour pressure.

Mitochondria

- Mitochondria are also called as powerhouse of cells.

Plastids

- Plastids are found in plants and few protists Euglena.

Ribosomes

- Ribosomes are smallest cell organelles. They are protein synthesising factories.
  There are two types of ribosomes viz.,
  – Prokaryotic or 70S ribosomes
  – Eukaryotic or 80S ribosomes

Nucleus

- Nucleus is centrally located, spherical and largest component of the all eukaryotic cell. It contains the genetic material of the cell.

Structure of Nucleus

- A typical nucleus consists of four structures: (i) nuclear membrane, (ii) nucleoplasm (iii) chromatin and (iv) the nucleolus.

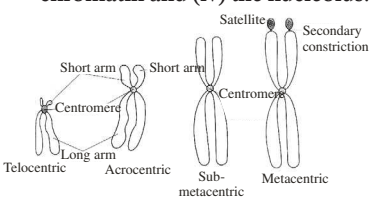


Fig. : Types of chromosomes based on the position of centromere

Nucleolus

- It is present inside the nucleus.
- It is the site of active ribosomal RNA synthesis.

Study of heredity and variation is called genetics.

- Term genetics was given by - Bateson.
- Father of genetics - Gregor Johann Mendel.
- Father of experimental genetics - Thomas Hunt Morgan.
- Father of human genetics - Archibald Garrod.

Some Terms in Genetics

Gene : It is segment of DNA. It is basic unit of heredity.

Back cross : It is cross which is performed between hybrid and one of its parents.

Test cross : Test cross is crossing of offspring with unknown dominant phenotype with the individual homozygous recessive for the trait.

Monohybrid cross : It is a cross between two organisms of a species which is made to study the inheritance of a single pair of alleles or factors of a character.

Monohybrid ratio : Monohybrid ratio is usually 3 : 1 (phenotypic ratio) or 1 : 2 : 1 (genotype ratio) in which 25% of the individuals carry the recessive trait, 25% pure dominant and 50% have hybrid dominant trait.

Dihybrid cross : It is a cross between two organisms of a species which is made to study the inheritance of two pairs of factors or alleles of two genes.

Dihybrid ratio : Dihybrid ratio is 9 : 3 : 3 : 1 (phenotypic ratio) where 9/16 first recessive and second dominant and 1/16 carry both the recessive traits.

- Mendel conducted cross hybridization experiments on Garden Pea plant (Pisum sativum). The first was the **Principle of segregation**, which claimed that each trait was specified by paired hereditary determinants (alleles of genes) that separate from each other during gamete formation. This law is also called **Law of purity of gametes or Law of splitting of hybrids.**
- **Gregor Mendel** was the first individual to apply a modern scientific approach to the study of heredity. Mendel proposed two basic principles of trasmission genetics.
- Mendel's second basic conclusion was the **Principle of independent assortment,** which stated that the segregation of one pair of genes-controlling a given trait - was not influenced by the segregation of other gene pairs. The chormosome theory provided a physical basis for the principle of independent assortment. Genes located on different chromosomes move to gametes independently of each other during meiosis.

Human Blood Groups and Multiple Allele

- The system of blood groups in humans was discovered by Karl Landsteiner in 1900s.
- There are four phenotypes of Blood namely **A**, **B**, **AB** and **O** produced by three different alleles $\mathbf{I^A}$, $\mathbf{I^B}$ **and i** of a gene.
- The allele $\mathbf{I^A}$ and $\mathbf{I^B}$ are equally dominant and do not interfere with expression of each other hence the allele $\mathbf{I^A}$ $\mathbf{I^B}$ are said to be co-dominant because both are expressed in the phenotype **AB**.
- **Linkage** is the phenomenon of certain genes staying together during inheritance through generations without any change or separation due to their being present on the same chromosomes.
- Linkage in the genes can be identified by test cross.
- The rearrangements of linked genes due to crossing over is known as **recombination.** Recombination also occurs due to chance separation of chromosomes during gametogenesis and their random coming together during fertilization.

Sex Determination

- **Henking** discovered X body in spermatogenesis of few insects and it was given name of X chromosome. Due to involvment of X and Y chromosomes in determination of sex, they were called **sex chromosomes.**
- Rest of the chromosomes which determine other metabolic character of the body are called **autosomes**.

Mutation

- Phenomenon that results in alteration of DNA sequence and consequently results in change in genotype and phenotype of an organism is called **mutation**.
- **Mutagens** are various chemical and physical factors that induce mutations, e.g., UV radiations, carcinogenic chemicals like nicotine, nitric oxide (NO).

Genetic Disorder

- A genetic disorder is a disease that is caused by an abnormality in an individual's DNA.

Haemophilia

- A protein involved in clotting of blood is affected in an affected individual; if person gets a cut, will result in non-stop bleeding.

- Females are heterozygous and carriers of haemophilia.

Sickle Cell Anaemia

- It is due to inheritance of defective allele coding for β-globin. It results in the transformation of Hb^A into HbS in which glutamic acid is replaced by valine at 6th position in each of two β-chains of haemoglobin.
- It is an excellent example of single mutation.

Phenylketonuria

- Affected individual lacks enzyme phenylalanine hydroxylase that converts amino acid phenylalanine to tyrosine.
- It is characterized by severe mental retardation, hypopigmentation of skin & hair, eczema, etc.

PLANT PHYSIOLOGY

Photosynthesis

- Photosynthesis occurs in specialized cells called mesophyll cell which contain chloroplast.
- Photosynthesis follows two main step Light dependent reaction which occur in grana of the chloroplast and Light dependent reaction which occur in stroma region of the chloroplast.
- It is actually oxidation reduction process in which water is oxidized and CO_2 is reduced to carbohydrates.
- The reduction of CO_2 to carbohydrates needs assimilatory powers, ie., ATP and $NADPH_2$.

Respiration

- Carbohydrates are broken down through the process of oxidation and releasing of energy for cellular use, is called respiration. Respiration occurs in three steps as Glycolysis, Kreb's Cycle and Electron transport system.
  $C_6H_{12}O_6 + 6CO_2 \rightarrow 6CO_2 + 6H_20$ + energy
- Glycolysis occurs in the cytoplasm of the cell and the final product is pyruvate which is transported from the cytoplasm to mitochondria. Citric acid cycle/Kreb's cycle occur in mitochondrial matrix and $3NADH_2$, $1FADH_2$ and 1 GTP (ATP) produced by each turn of TCA cycle. In Electron transport system electron are passes in a downhill journey releasing energy at every step that is used in generating electrochemical proton gradient which help in synthesizing energy.

Transpiration

- Loss of water in the form of water vapour from plant through the small pore (stomata) present on leaves is called transpiration.

Nitrogen metabolism

- Plants obtain Nitrogen from the soil in the form of nitrites (NO_2^-), nitrates (NO_3^-) and ammonium (NH_4)$^+$ salts. Nitrogen assimilation is carried out by plants in three steps.
- **Ammonification:** It is the process of conversion of complex organic compounds like protein into ammonia in the presence of ammonifying bacteria.
- Proteins → Amino acids → Organic acids → Ammonia

- Nitrification: Ammonia is rapidly converted first to nitrite and then nitrates by the process of nitrification. Nitrification is brought about by nitrifying bacteria such as Nitrosomonas and Nitrobacter.
- Denitrification: It is the process of conversion of nitrate salts present in the soil and water to gaseous nitrogen which escapes into atmosphere. It takes place with the help of bacteria called Pseudomonas.

Plant Growth Regulators

Some chemical molecules secreted by the plants which affect the growth of the plant known as Plant growth regulators.

- Auxin: It controls division in the vascular cambium and xylem differentiation. It Promotes flowering. It also causes the phenomenon of apical dominance.
- Gibberellines: It causes an increase in length of axis of the plant. It delay senescence and help in induction of seed germination.
- Cytokinins: It promotes cell division and growth of lateral branches by inhibiting apical dominance. It also promotes formation of adventitious shoot.
- Ethylene: It is synthesized in the tissue undergoing senescence and ripening of fruits. It promtes in ripening of fruits and accelerate the abscission of flower.
- Abscisic acid: It causes ageing and abscission of leaves and fruits. It also regulates bud and seed dormancy.

HUMAN PHYSIOLOGY

Digestion of Food

Name of the Digestive juice	Name of the enzymes	Substrate	End product
Saliva	Ptyalin (Salivary amylase)	Starch	Maltose
Pancreatic iuice	Amylopsin (pancreatic amylase)	Starch, Glycogen	Maltose and Glucose
Intestinal juice	Sucrase (invertase), Maltase, Lactase	Sucrose; Maltose, Lactose	Glucose and fructose, Glucose, Glucose and galactose
Gastric Juice	Pepsin, Rennin	Proteins, Casein	Proteoses and peptones, Calcium caseinate
Pancreatic Juice	Trypsin, Chymotrypsin, Carboxyl peptidases	Proteins, Proteins Peptides	Proteoses and peptides Peptides Amino acid.
Intestinal juice	Amino peptidase, Dipeptidase	Peptides	Amino acids, Amino acids

Vitamin required by the body

Vitamin	Chemical Name	Function in Body	Deficiency Disease	Sources
B_1	Thiamine pyrophosphate	Part of coenzyme for respiration	**Beri-beri:** nerve and heart disorders	Found in whole grain cereals, legumes, beans, nuts, brewer's yeast, wheat germ, pork, ham, and liver.
B_2	Riboflavin	Part of coenzyme FAD needed for respiration	**Ariboflavinosis:** skin and eye disorders	Milk, yogurt, other dairy, meat, leafy greens, whole grains.
B_{12}	Cyanoco-balamin	Coenzyme needed for making red blood cells, bone, blood and nerve changes	**Pernicious anaemia**	Animal products (meat, fish, poultry, shellfish, eggs, cheese, milk).
B_5	Nicotinic acid ('niacin')	Part of coenzymes NAD, NADP used in respiration	**Pellagra:** skin, gut and nerve disorders	Widespread in foods.
C	Ascorbic acid	Not precisely known	**Scurvy:** degeneration of skin teeth and blood vessels.	
A	Retinol	Not fully known but forms part of visual pigment, rhodopsin	**Xeropthalmia:** 'dry eyes'	Milk, eggs, meat, fish liver oilsz: Green leafy vegetables - kale, spinach, broccoli Yellow Vegetables - carrots, sweet potatoes Fruits- mango, papaya and apricot

D	Cholecalciferol	Stimulates calcium absorption by small intestine, needed for proper bone growth	**Rickets:** bone deformity	Formed in skin when exposed to sunlight. Also found in dairy products, egg yolk, fish liver oils, oysters, yeast.
E	Tocopherol	Not precisely known	**Infertility**	Found primarily in plant oils, green, leafy vegetables, wheat germ, whole grains, egg yolk, nuts, seeds, and liver.
K	Phylloquinone	Involved in blood clotting	**Possible haemorrage**	Bacterial synthesis in the digestive tract. Diet generally supplies remaining need. Green, leafy vegetables, cabbage-type vegetables and milk

Minerals	Source	Function
Sodium (Na)	Table salt large amounts is present in processed foods, small amounts in milk, breads, vegetables, and meats	Needed for proper fluid balance, nerve transmission, and muscle contraction
Chloride	Table salt, large amounts is present in processed foods, small amounts in milk, meats, breads, and vegetables	Needed for proper fluid balance, stomach acid
Potassium	Meats, milk, fresh fruits and vegetables, whole grains, legumes	Needed for proper fluid balance, nerve transmission, and muscle contraction

Calcium	Milk and milk products, canned fish with bones (salmon, sardines), fortified tofu and fortified soy milk, greens (broccoli, mustard green), legumes	Important for healthy bones and teeth, helps muscles relax and contract, important in nerve functioning, blood clotting, blood pressure regulation, immune system health
Phosphorus	Meat, fish, poultry, eggs, milk, processed foods	Important for healthy bones and teeth, found in every cell, part of the system that maintains acid-base balance
Magnesium	Nuts and seeds; legumes, leafy, green vegetables, seafood, and chocolate	Found in bones, needed for making protein, muscle contraction, nerve transmission, immune system health
Sulfur	Occurs in foods as part of protein, meats, poultry, fish, eggs, milk, legumes, nuts	Found in protein molecules
Iron	Organ meats; red meats, fish, poultry, shellfish (especially clams), egg yolks, legumes; dried fruits dark, leafy greens, iron-enriched breads and cereals, and fortified cereals	Part of a molecule hemoglobin found in red blood cells that carries oxygen in the body, needed for energy metabolism
Iodine	Seafood, foods grown in iodine-rich soil, iodized salt, bread, dairy products	Found in thyroid hormone, which helps regulate growth, development, and metabolism

Inorganic Elements in the Human Diet

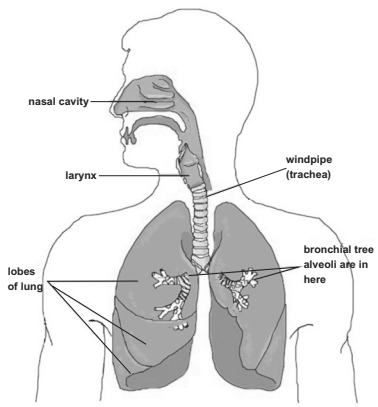
Element	Common ions	Functions in human body
Calcium	Ca^{2+}	Calcium ions are needed for stability of cell membranes, as cofactors for some enzymes and are involved in muscle contraction and blood clotting.
Phosphorus	H_2PO_4	Bones component of many organic molecules like DNA, RNA and ATP.
Potassium Sodium Chlorine	K^+ Na^+ CI^-	These ions are important in determining the balance of electrical charges in body fluids.

Iron	Fe^{2+}, Fe^{3+}	Component of haemoglobin and cytochrome molecules.
Iodine	I^-	Component of hormone thyroxin.
Copper Manganes Zinc	Cu^{2+} Mn^{2+} Zn^{2+}	Trace elements as enzyme cofactors, for example, Cu^{2+} is co-factor for cytochrome oxidase.

- Marasmus is produced by a simultaneous deficiency of proteins and calories. In Marasmus, protein deficiency impairs growth and replacement of tissue proteins; extreme emaciation of the body and thinning of limbs results, the skin becomes dry, thin and wrinkled. Growth rate and body weight decline considerably.
- Kwashiorkar is produced by protein deficiency unaccompanied by calorie deficiency. Like marasmus, kwashiorkor shows wasting of muscles, thinning of limbs, failure of growth and brain development.

Human Respiratory System

- Human respiratory system consists of external nostrils, nasal cavity, nasopharynx, larynx, trachea, bronchiole and lungs.



Transport of gases

- 97% of oxygen is transported from the lungs to the tissues in combination with haemoglobin ($Hb + O_2 \longrightarrow HbO_2$, oxyhaemoglobin). 3% is transported in dissolved condition by the plasma.

There are three ways of transport of CO_2.

- 5%–7% (approximately) of CO_2 is transported, being dissolved in the plasma of blood.
- CO_2 react with the water to form *carbonic acid* (H_2CO_3) by the enzyme carbonic anhydrase (present in RBC).
- CO_2 reacts with amine radicals (NH_2) of haemoglobin molecule and forms a carbamino – haemoglobin ($HbCO_2$) molecule. Nearly 23% of CO_2 is transported through this mode.

Circulatory Pathways

The circulatory patterns are of two types –

- **Open circulatory system** is present in arthropods and molluscs in which blood pumped by the heart passes through large vessels into open spaces or body cavities called sinuses. Annelids and chordates have a closed circulatory system in which the blood pumped by the heart is always circulated through a closed network of blood

vessels. All vertebrates possess a muscular chambered heart. Fishes have a 2-chambered heart with an atrium and a ventricle. Amphibians and the reptiles (except crocodiles) have a 3-chambered heart with two atria and a single ventricle, whereas crocodiles, birds and mammals possess a 4-chambered heart with two artia and two ventricles.

Heart beat and pulse

- The human heart beats at the rate of about 72-80 per minute in the resting condition.

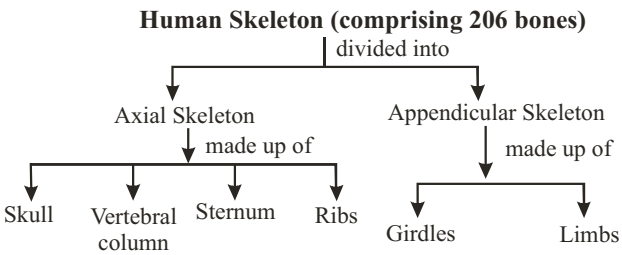
Electrocardiograph

- ECG is the graphic record of electronic current produced by the excitation of cardiac muscles.
- A normal electrocardiogram is composed of a p wave, QRS complex and T wave. P wave indicate the depolarisation of the atria. QRS complex expresses the ventricular depolarisation. T wave indicate an repolarisation of ventrcle.

Excretion

- The process of excreting ammonia is -**Ammonotelism**. kidney plays a minor role in the elimination of ammonia e.g., teleost fishes, tadpoles, aquatic soft bodied invertebrates. Organism undergoing ammonotelism are called **ammonotelic**.
- The process of excreting urea is - **Ureotelism**. Examples are mammals, many terrestrial adult amphibians and cartilaginous fishes (shark).
- The process of elimination of uric acid is **Uricotelism** Examples are land snails, insects, birds and many reptiles.
- Each kidney has nearly one million complex tubular structures called **nephrons**, which are the functional units of kidney. These filter the blood to produce urine.

Skeletal System



Axial Skeleton : Skeleton which occurs in the mid axial or longitudinal part of the body.

(i) **Skull** is made up of 29 bones. It is composed of

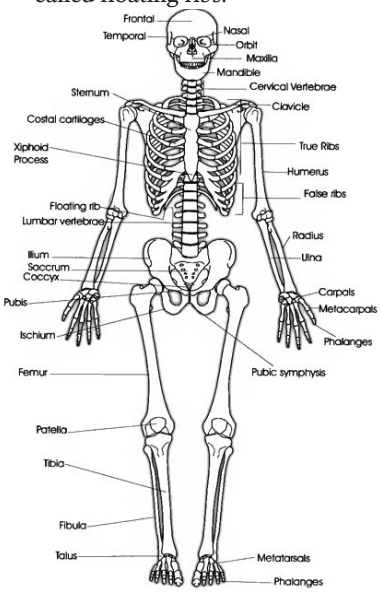
- **Cranium (8 bones) :** Frontal -1; Parietal-2; Occipital-1; Temporal - 2; Sphenoid - 1; Ethmoid - 1.
- **Facial bones (14 in number) :** Nasal-2; Maxillae - 2; Zygomatic -2; Lacrymals-2; Mandibles - 1; Inferior turbinals-2; Vomer-1; Palatines-2. Hyoid Tongue bone-1
- **Ear ossicles (6 bones) :** Malleus -2; Incus - 2; Stapes - 2.

(ii) **Vertebral column :** 33 in babies, 26 in adults. Grouped into 5 categories :

- Cervical-7; Thoracic-12; Lumber-5; Sacral - 5; Coccygeal - 4 (fused in adults).

(iii) **Sternum :** Composed of 3 parts → Manubrium, body of sternum and xiphoid process .

(iv) **Ribs :** They are twelve pairs. First seven pairs are true ribs. The 8th, 9th and 10th ribs are called false ribs or vertebrochondrial ribs. The last 11th and 12th pairs are called floating ribs.



Appendicular Skeleton : Present laterally or attached to the axial skeleton.

(i) **Girdles :** 2 types - pectoral and pelvic.
Pectoral girdle : made of two parts - clavicle and scapula.
Pelvic girdle : made of three bones - ilium, pubis and ischium.

(ii) **Limb bones :** Hind limbs and fore limbs - both made up of 30 bones each.
Fore limbs : Humerus (1); Radius-Ulna (2); Carpals (8); Metacarpals (5); Phalanges (14); Phalanges formula = 2, 3, 3, 3,

(iii) **Hind limbs :** Femur (1); Tibia-Fibula (2); Patella (1); Tarsals (7); Metatarsals (5); Phalanges (14).

Joints

- A joint is a location at which two bones make contact and is essential for all types of movements, involving the bony parts of the body.

Synovial joints - Movable joints: They are characterised by the presence of a closed space or cavity between the bones.

- This kind of joint are classified into six major categories.
  - **Plane** (gliding joint) : Present between carpals. Only sliding motion in all direction is allowed.
  - **Hinge joint :** Present between Knee joint
  - **Pivot joint :** Present between atlas and axis
  - **Saddle joint :** Present between carpal and metacarpal
  - **Ball and Socket joint :** Present between humerus and pectoral girdle.

Neural Control and Coordination

- The neural sysem is the control system of the body which consists of highly specialized cells called neurons.
- A neuron consists of main cell body and cytoplasmic processes arising from it.

The human brain is divisible into three parts:

- **Forebrain :** It comprises the olfactory lobes, cerebrum and diencephalon.

Cerebrum is the largest and complex part. It consists of the left and right hemispheres connected by a bundle of myelinated fibres, called corpus callosum. The outer layer of the cerebrum is called the cortex.

- **Diencephalon :** The main parts of the diencephalon are epithalamus, thalamus and hypothalamus.
  The hypothalamus is the highest centre of autonomic nervous system. It governs emotional reactions and exercise control over sleep mechanism.
- **Midbrain :** It is formed of corpora quadrigemina and cerebral peduncles. Cerebral penduncles are bundles of fibres connecting the cerebral cortex with other parts of brain and spinal cord.
- **Hind brain :** It comprises of :
  – Cerebellum : It controls the balance and posture of the body.
  – Pons varolii - The pons is concered with maintenance of normal rhythm of respiration.
  – Medulla oblongata - Medullary centres (reflex centres) are present for controlling the functions of important organs, e.g., cardiac centres (heart), respiratory centre, vasomotor centre (for regulating diameter of blood vessels) and reflex centres (for swallowing, vomiting, peristalsis, secretion and activity of alimentary canal, salivation, coughing etc.)

Chemical Coordination in Animal (Hormones)

Endocrine Gland	Hormone	Principal action	Disorders
Thyroid	Thyroxine (T_4) and Triiodothyronine (T_3)	Maintains calcium level normal in the body.	Cretinism, myxoedema goiter
	Calcitonin	Increases rate of metabolism in the body.	
Parathyroid	Parathormone (PTH)	Increases plasma calcium	Parathyroid tetany osteoporosis
"Adrenal gland (medulla)"	"Adrenaline and Noradrenaline"	Increases heart beat, blood sugar and also constricts blood vessel	
Adrenal cortex	"Mineralocorticoids (aldosterone)"	Increases reabsorption of sodium and excertion of potassium	"Addison's disease Adrenal virilism"
	Glucocorticoids (cortisol)	Increases blood sugar and affects carbohydrate, fat and protein metabolism	Cushing's syndrome
Hypothalamus	ARH	Regulates corticotropin secretion	
	TRH	Thyrotropin secretion	
	SRH	Stimulates secretion of gonadotropins	
	(Growth hormone releaing factor)	Regulates secretion of prolactin	

	(Prolactir releasing hormone) and (Prolactin inhibitory hormone)	Control secretion of MSH	
Pituitary gland anterior lobe	Pituitary gland anterior lobe	Stimulates general growth	Pituitary dwarfism, gigantism, Acromegaly
	Prolactin	Stimulates milk production and secretion	
	(Follicle stimulating hormone)	Stimulates ovarian follicle and spermatogenesis	
	(Lutemizing hormone)	Stimulates corpus luteum and ovulation in females and interstitial cell in males	
	(Thyroid stimulating hormone)	Stimulates thyroid gland to secrete hormones	
	Adrenocorticotropic hormone	Stimulates adrenal cortex to secrete glucocorticoids	
Intermediate lobe	Melanocyte stimulating hormone	Growth and development of melanocyte	
Posterior lobe	Oxytocin	Contraction of uterine muscles and mammary gland cells	
	"Vasopressin (ADH)"	Promotes reabsorption of water from collecting ducts of kidneys	Diabetes insipidus

DIVERSITY IN LIVING ORGANISM

- **Biodiversity** refers number and types of wide variety of plants and animals present on earth.
- In 1773, Swedish botanist **Carolus Linnaeus** formulated the system of binomial nomenclature in his book 'Species plantarum'. In binomial system, each name is expressed in two parts *i.e.*, **generic** name and **specific** name.
- **Taxonomy** is the branch of biology that deals with the framing of laws and principles for classifying the organisms on the basis of their characteristics and evolutionary relationships.
- The hierarchial system of classification was introduced by **Linnaeus**.
  Kingdom → Phylum or Division → Class → Order→ Family → Genus → Species

Basic Features of Whittaker's Five Kingdoms

Kingdom	Cellular Organisation	Movement	Nutrition	Reproduction
1. Monera (All Prokaryotes)	Unicellular, without nucleus or membranous organelle.	By flagella (tubulin-dynein system)	Absorptive or photosynthetic	Asexual
2. Protista (Protozoans, unicellular algae)	Unicellular, eukaryote with nucleus and membranous organelles.	By flagella, cillia, pseudopodia and mucilage propulsion	Absorptive, photosynthetic & holozoic	Both sexual and asexual
3. Fungi (Multicellular decomposers)	Multicellular eukaryote coenocytic, no plastids, cells wall of cellulose, chitin.	Non-motile	Heterotrophic (saprophytic/ parasitic)	Asexual and sexual both
4. Plantae (All plants)	Multicellular, higher organisation eukaryotes, cellulosic cell wall, plastids present.	Non-motile	Autotrophic or photosynthetic	Asexual and sexual both
5. Animalia (All animals)	Multicellular, higher organization, eukaryotes without cell wall and chlorophyll.	Highly motile with all type of motile machinery	Heterotrophic (holozoic or saprozoic)	Both sexual and asexual but in higher forms only sexual

Plant Kingdom

DIVISIONS OF ALGAE AND THEIR MAIN CHARACTERISTICS

Classes Name	Common	Major Pigments Food	Stored	Cell Wall	Flagellar Number and Position of Insertions	Habitat
Chlorophyceae	Green algae	Chlorophyll *a, b*	Starch	Cellulose	2-8, equal, apical	Fresh water, brackish and salt water.

Phaeophyceae	Brown algae	Chlorophyll *a, c*, fucoxanthin	Mannitol, laminarin	Cellulose and algin	2, unequal, lateral	Fresh water (rare), brackish water, salt water
Rhodophyceae	Red algae	Chlorophyll *a, d*, phycoerythrin	Floridean starch	Cellulose	Absent	Fresh water (some), brackish water, salt water (most)

Bryophytes

- Bryophytes are also called **amphibians of the plant kingdom** because these plants can live in soil but are dependent on water for sexual reproduction. They usually occur in damp, humid and shaded localities.
- Species of *Sphagnum*, a moss, provide peat that have long been used as fuel, and because of their capacity to hold water as packing material for trans-shipment of living material.

Pteridophytes

- Evolutionarily, they are the first terrestrial plants to possess vascular tissues – xylem and phloem.
- The main plant body is a sporophyte which is differentiated into true root, stem and leaves. These organs possess well-differentiated vascular tissues. Examples are *Psilotum, Equisetum, Dryopteris, Marsilea*, etc.

Gymnosperms

- Gymnosperms are plants which bear naked seeds *i.e.*, the ovules and the seeds that develop from these ovules after fertilization are not enclosed in fruit wall.
- Roots in some genera have fungal association in the form of **mycorrhiza** (*Pinus*), while in some other (*Cycas*) small specialised roots called **coralloid roots** are associated with N_2–fixing cyanobacteria.

Angiosperms (Flowering Plants)

- Angiosperms are seed bearing, flowering vascular plants in which seeds are enclosed in fruits.
- The flower is the most characteristic structure of the angiosperms. The male sex organ in a flower is the **stamen**. Each stamen consists of a slender **filament** with an **anther** at the tip. The anthers, following meiosis, produce pollen grains.
- The female sex organ in a flower is the **pistil** or the **carpel**. Pistil consists of an ovary enclosing one to many ovules. Within ovules are present highly reduced female gametophytes termed **embryo sacs**.

  Each embryo-sac has a seven-celled **egg apparatus** – one **egg cell** and two **synergids**, three **antipodal** cells and two **polar nuclei**. The polar nuclei eventually fuse to produce a diploid secondary nucleus.

- Pollen grain, after dispersal from the anthers, are carried by wind or various other agencies to the stigma of a pistil. This is termed as **pollination**.
- The pollen tubes enter the embryo-sac where two male gametes are discharged. One of the male gametes fuses with the egg cell to form a zygote (**syngamy**). The other male gamete fuses with the diploid secondary nucleus to produce the **triploid primary endosperm nucleus (PEN)**. Because of the involvement of two fusions, this event is termed as **double fertilisation**, and event unique to angiosperms.

Animal Kingdom

- Animals are the most diverse groups of organisms. Multicellular, heterotrophs characterised by mobility, sensory and nervous systems.

Phylum-Porifera

- Sponges are aquatic, mostly marine, solitary or colonial and sessile.
- Examples of some sponges are : *Sycon* (scypha), Spongilla (fresh water sponge) and *Euspongia* (bath sponge).

Phylum-Coelenterata (Cnidaria)

- All are aquatic and are mostly marine (exception-Hydra are found in fresh-water), solitary or colonial, sessile, or free-swimming and radially symmetrical animals.
- Example-*Physalia* (Portuguese man of war), *Adamsia* (Sea anemone), *Pennatula* (Sea-pen), *Gorgonia* (Sea-fan) and *Meandrina* (Brain coral).

Phylum-Ctenophora

- These are diploblastic, radial symmetrical animals with tissue level of organization.
- Examples–*Hormiphora* (sea walnut), *Pleurobranchia* (sea gooseberry), *Cestum* (venus girdle), Beroe.

Phylum-Platyhelminthes

- These are mostly endoparasites, bilateral symmetrical, triploblastic and acoelomate animals with organ level of organisation.
- Examples– *Taenia* (Tape worm), *Fasciola* (liver fluke).

Phylum-Aschelminthes

- They may be free-living, aquatic and terrestrial or parasitic in plants and animals.
- Examples: *Ascaris* (Round worm), *Wuchereria* (filarial worm), *Ancylostoma* (Hook worm), *Enterobius* (Pin worm).

Phylum-Annelida

- It is characterised by metameric segmentation forming ring like segments.
- Example: *Neries, Pheretima* (Earthworm) and *Hirudinaria* (Blood sucking leech).

Phylum-Arthropoda

- They are bilateral symmetry, triploblastic animals, which have organ-system level of organisation.
- Example: *Apis* (Honey bee), *Bombyx* (Silkworm), *Laccifer* (Lac insect).

Phylum-Mollusca

- They are aquatic (marine or fresh water), or terrestrial having an organ-system level of organisation.
- Ex. *Pila*, *Octopus* (devil fish), *Loligo* (sea squid).

Phylum-Echinodermata

- All existing echinoderms are marine, generally live at sea bottom.
- Ex. *Asterias* (star fish), *Cucumaria* (commonly called as sea cucumber), *Antedon* (water lily or feather star).

Phylum-Hemichordata

- They are bilaterally symmetrical, triploblastic, and entrocoelous animals.
- Ex. *Balanoglossus* (acorn worm or tongue worm), *Saccoglossus*.

Phylum-Chordata

- The fundamental four characters of phylum chordata are presence of notochord, a dorsal hollow nerve cord, paired pharyngeal gill slits and post anal tail either in the embryonic or adult stage.
- Examples: *Herdmania* (sea squirt), *Branchiostoma*.

Subphylum vertebrata is divided into two sections:

Section 1 Agnatha (The jawless vertebrates)

Class : Cyclostomata

- Mouth jawless suctorial and round.
- All living members are ectoparasites on some fishes.
- Ex. *Petromyzon* (lamprey), *Myxine* (hag fish).

Section 2 Gnathostomata (The jawed vertebrates)

Superclass : Pisces (Bear fins)

Class : Chondrichthyes

- They have a cartilagenous skeleton.
- Some of them possess electric organs e.g. Torpedo.
- Examples: *Scoliodon* (Dog fish), *Trygon* (Sting ray).

Class : Osteichthyes

- They have a bony skeleton.
- Examples : Marine – *Exocoetus* (Flying fish), *Hippocampus* (Sea horse), *Lophius* (Angler fish), Fresh water fishes – *Labeo* (Rohu), *Catla* (Katla).

Superclass : Tetrapoda (Bear Limbs)

Class : Amphibia

- Adapted for both water and land life.
- They are oviparous and development indirect through distinct larval stage called tadpole. Exambles : *Bufo* (Toad), *Rana* (Frog), *Hyla* (Tree frog), *Salamandra* (Salamander), *Ichthyophis* (Limbless amphibia).

Class: Reptilia

- The class name refers to their creeping or crawling mode of locomotion.
- They are oviparous ; Development direct.
  Examples: *Crocodilus* (Crocodile), *Bangarus* (Krait)

Class: Aves

- Birds are bipedal feathered animals.
- Endoskeleton is fully ossified (bony) and the long bones are hollow with air cavities (pneumatic).
  Examples : *Corvus* (crow), *Pavo* (Peacock).

Class: Mammalia

- These are warm blooded (homiothermous) animals having hair and mammary glands.
- They are viviparous with few exceptions and development is direct.
  Example : Oviparous – *Tachyglossus* = *Echidna* (spiny Anteater). Viviparous – *Pteropus* (Flying fox), *Camelus* (Camel), *Macaca* (Monkey).

DISEASE AND DEFENCE MECHNANISM

Pratozoan diseases

Disease	Pathogen
1. Malaria	Plasmodium
2. Amoebiasis	Enta moeba histolylica
3. Giardiasis	Giardia Lambia
4. Sleeping Sickness	Trypanosoma
5. Leshmanis	Leishmania
6. Trichomoniasis	Trichomonas Vaginalis

Fungal diseases

Disease	Pathogen
1. Aspergillosis	Aspergillus fumigatuo
2. Candidiasis	Candida albicens
3. Ringworm	Trichoplyton
4. Blastomycosis	Blasto myces dermatitidis
5. Sporotnichosis	Sporothrix Schenckii

Bacteria Diseases

Disease	Pathogen
Dysentery	*Shigella*
Plague	*Pasteurellapestis*
Diphtheria	*Corynebacterium diphtheriae*
Cholera	*Vibrio cholerae*
Tuberculosis	*Mycobacterium tuberculosis*
Tetanus	*Clostridium tetani*
Whooping cough	*Bordetella pertussis*
Leprosy	*Mycobacterium leprae*
Anthrax	*Bacillus anthrasis*
Weil's disease	*Leptospira*

Viral Diseases

Disease	Pathogen
Rabies	Rabies virus
Dengue	Dengue virus
Influenza	Influenza virus
Measles	Rubeola virus
German measles	Rubella virus
Mumps	Mumps virus
Chicken pox	Varicella zoster
Small pox	Variola virus
Polio	Polio virus
Chikungunya	Chikungunya (CHIK) Virus
Avian flu	H5N1 virus
H1N1(Swine flu)	H1N1 virus

Select nutrient-deficiency diseases

Vitamin/ nutrients	Diseases	Symptoms	Food Sources
Vitamin A	xerophthalmia	blindness from chronic eye infections, poor growth, dryness and keratinization of epithelial tissues	liver, fortified milk, sweet potatoes, spinach, greens, carrots, cantaloupe, apricots
Vitamin D	rickets	weakened bones, bowed legs, other bone deformities	fortified milk, fish oils, sun exposure

Thiamin	beriberi	nerve degeneration, altered muscle coordination, cardiovascular problems	pork, whole and enriched grains, dried beans, sunflower seeds
Niacin	pellagra	diarrhoea, skin inflammation, dementia	mushrooms, bran, tuna, chicken, beef, peanuts, whole and enriched grains
Vitamin C	scurvy	delayed wound healing, internal bleeding, abnormal formation of bones and teeth	citrus fruits, strawberries, broccoli
Iron	iron-deficiency anemia	decreased work output, reduced growth, increased health risk in pregnancy	meat, spinach, seafood, broccoli, peas, bran, whole-grain and enriched breads
Iodine	goitre	enlarged thyroid gland, poor growth in infancy and childhood, possible mental retardation, cretinism	iodized salt, saltwater fish

Immunity

- The term **immunity** refers to the specific resistance exhibited by the host towards infections by micro-organisms (pathogens) and their products.

Innate or Natural Immunity

- Innate immunity is developed in an individual without having the disease or immunization, e.g., recreation of sweat glands contain certain chemical substances which prevent the entry of micro-organisms.
- It is present from birth.
- It is the general defence of body including the following four mechanism —

(i) Phagocytosis of invaders by leucocytes and macrophages (called cellular barrier).

(ii) Resistance of skin to invading micro-organisms (called physical barrier).

(iii) Destruction of micro-organisms swallowed with food by the HCl of gastric juice & by digestive enzymes and tear from eye (called physiological barriers).

(iv) Virus infected cells secrete proteins (called interferons) which protect non-infected cells from further viral infection (cytokine barriers)

Acquired Immunity

- It is a third line defence and developed by an animal in response to a disease caused by infections of microbes.
- The resistance against infectious disease that an individual acquires during life is known as acquired immunity.

Antibody Mediated Immunity

- B cells produce specialized proteins called antibodies (immunoglobulin) which are glycoproteins.

Classification of Antibodies :

(a) **Ig A** – Protects from inhaled or ingested pathogens.
(b) **Ig D** – Present on lymphocyte surface as receptors, activation of B cells.
(c) **Ig E** – Mediator in allergic response.
(d) **Ig G** – Stimulation of phagocytes and complement system, passive immunity to foetus.
(e) **Ig M** – Activation of B cells.

MERS : Middle East Respiratory Syndrome (MERS) is new viral disease related to respiratory illness. It has been reported to World Health Organization (WHO) since 2012, first reported in Saudi Arabia. To date most of the affected countries is Middle East include Egypt, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia and UAE. People affected with MERS-CoV developed severe acute respiratory illness including fever, cough and shortness of breath.

SARS : Severe Acute Respiratory Syndrome (SARS) is one of the severe and readily transmissible new disease emerged in the 21st Century. SARS is caused by coronavirus called, SARS-associated coronavirus (SARS-CoV). First time this disease was reported in November 2002 in Guangdong province, China. In general SARS begins with high fever headache an overall feeling of discomfort, and body aches. Some people also have mild respiratory symptoms at the outset.

Ebola: Ebola hemorrhagic fever (Ebola HF) is a severe, often-fatal disease in humans and nonhuman primates (monkeys, gorillas, and chimpanzees). The disease is caused by infection with Ebola virus, named after the Ebola River found in Democratic Republic of Congo (DRC). Ebola is spread through direct contact (through broken skin or unprotected mucous membranes in, for example, the eyes, nose, or mouth). The symptoms appears for Ebola HF from 2 to 21 days. Symptoms are characterized by fever, headache, joint and muscle aches, sore throat, and weakness, followed by diarrhea, vomiting, and stomach pain.

AIDS: Acquired Immune Deficiency Syndrome (AIDS) is caused by Human Deficiency Virus (HIV) which destroys the CD4 Cells that are essential for the body immune symptoms. HIV is transmitted (spread) through the blood, semen, genital fluids, or breast milk of a person infected with HIV. Unprotected sex and sharing of drug injection equipment with the person infected with HIV are the most common ways of HIV transmission. It takes many years to develop the HIV symptoms but the HIV infected person can spread the virus at any stage of HIV infection. 1st December is also remembered as World AIDS day globally people unite together to fight against HIV showing support to the people infected with HIV.

Rabies: Rabies is a viral disease which is endemic in most African and Asian countries and it affects the central nervous system of warm blooded animals, including human. This fatal zoonotic viral disease transmitted to human through contact (mainly bites and scratches)

with infected animals both domestic and wild. Clinical signs of rabies in animals will vary depending on the effect of the virus on the brain. Typical signs include sudden behavioral changes and progressive paralysis leading to death.

Dengue: Dengue fever occurs through 1 to 4 types of dengue virus. It is spread by the bite of an infected dengue mosquito (*Aedes aegypti*). Dengue fever is more commonly seen in older children and adult. It is characterized by high fever lasting 3-7 days frontal headache pain behind the eyes and muscle and joint pain. There is no specific treatment for Dengue fever till now.

Chikungunya: Chikungunya fever (CF) is a viral illness caused by an arbovirus transmitted by the Aedes mosquitoes. Chikungunya disease does not often result in death, but the symptoms can be severe and disabling. Symptoms appear after 3-7 days after infected by the virus. Most common symptom is fever and joint pain. Other symptoms may include headache, muscle pain, joint swelling, or rash.

Common Heart diseases

- **Coronary artery disease or Arthrosclerosis:** In this disorder the deposition of calcium, fat, cholesterol and fibrous tissue occur in coronary arteries which makes the lumen of arteries narrower and thereby affect the blood supply.
- **Angina (angina pectoris):** Angina is an acute chest pain due to oxygen deficiency to heart muscles. It occurs due to oxygen deficiency to heart muscles. It occurs due to improper blood flow. It is common among middle-aged and elderly person.
- **Heart Failure (congestive heart failure):** It is the condition in which heart is not pumping blood enough to meet the need of the body. Congestion of the lung is the main symptom.
- Arteriosclerosis: It is the state of hardening of arteries and arterioles due to thickening of the fibrous tissue and consequent loss of elasticity. It leads to hypertension.

Common Lung diseases

- **Asthma:** It is a disease caused due to an allergic reaction to foreign substances that affect the respiratory tract. In people with asthma, the walls of these airways become inflamed (swollen) and oversensitive. The airways overreact to things like smoke, air pollution, mold, and many chemical sprays. Bronchioles can constrict (narrow) because of muscle spasms. Drugs called bronchodilators (inhalers). These devices help dilate (open up) the bronchioles.
- **Bronchitis (Inflammation of the Bronchi):** A condition where the bronchi and bronchioles get inflamed and their cavities become narrow so that air cannot pass in and out of lungs easily. The bronchial pathway gets blocked with the accumulation of mucus on the wall of bronchi due to which walls inflammation of the wall occur. Bronchitis occurs due to cough and cold smoking and exposure to air pollutant like carbon monoxide.

Common Brain diseases

- Epilepsy: Epilepsy is a condition where a person has recurrent seizures, abnormal discharge of electrical activity in the brain cells which may give rise to abnormal behavior such as involuntary muscle movements, unusual perceptions and disturbed level of consciousness. Epilepsy can occur due to brain injury, brain tumor, chemical abnormalities and alcohol or drug effects.
- Loss of Consciousness: Faintness includes the sensation of dizziness lightheadedness and weakness. The majority of attack is due to altered reflex affecting cardiac rate, vascular tone and some time due to severe cardiac disturbances.

Cancer : Cancer is a complex genetical disease which occurs due to the environmental factors. Cancer causing agent (carcinogen) may be present in food and water, in air in sunlight and in chemicals. Since epithelial cells cover our body surface and internal organs also like respiratory organ and alimentary tract which are more exposed to the carcinogens and more than 90% of cancer occur in epithelia. Tumors are of two main types 'benign' and 'malignant'. Benign tumors are slow growing and are located at a place and compress the surrounding tissue by their expensive mass of cells. Whereas malignant tumors are rapidly growing, invading surrounding tissue and most significantly colonizing the distant organ. Five common types of cancer in India are breast cancer, stomach cancer, oral cancer and cervical cancer. Breast cancer is the most common malignancy type diagnosed in women in developed countries and the second most common type diagnosed in developing countries. In 2003, Indian Council of Medical Research (ICMR) reported that oral cancer is very common in India. There has been great increase in oral sub-mucous fibrosis especially in youngsters.

Rotavirus: Rotavirus is a double stranded RNA belongs to the family of Reoviridae. Rotavirus was first time identified as a cause of diarrhea in 1973. Virus get enter through mouth and its replication occur in the villous epithelium of the small intestine. The incubation period for rotavirus diarrhea is short, usually less than 48 hours. The confirmation of rotavirus infection is detection of rotavirus antigen in stool by enzyme-linked immunoassay (EIA). There are two live oral Rotavirus vaccine RV5 (RotaTeq) and RV1 (Rotarix).

Various Transplantation

Transplantation of Organ: Organ transplantation is technique in which surgical removal of an organ or tissue from donor to the recipient has been done. Most donated organs and tissues are from people who have died but living person can also donate the organ. Newborns as well as senior citizens have been organ donors.

Skull transplantation: Doctor of US has successfully performed the world's first partial scalp and skull transplantation of James Boysen. He also had the kidney and pancreas transplantation at the same time. Boyson was suffering from the leiomyosarcoma a rare form of cancer

that affects the smooth muscles of his scalp. Radiation therapy for the cancer destroyed part of his head, immune suppression drugs kept his body from repairing the damage. Texas doctors have done the world's first partial skull and scalp transplant to make him free from cancer treatment. More than 50 doctors assisted or supported the surgery, including transplant surgeon, plastic surgeon, neurosurgeon and an anesthesiologist. This surgery is very complex as surgeons had to transplant the tissues utilizing microsurgery.



Kidney transplantation: Kidney transplantation is the treatment preferred for the patients who have developing end-stage renal disease or undergoing, chronic dialysis therapy. Large number of patients of kidney failure and high success rates of transplantation is a result of ongoing research studies to advance transplantation technique. A successful kidney transplant may improve the patient blood count and energy level. It may also improve the bone strength, growth, and appetite. But still some risk are there as of blood transfusions, immunosupressions and wound healing.

Heart transplantation: In 1968, Dr. P. K. Sen carried out first heart transplantation in India. In Mumbai after 47 years first successful heart transplantation was done by Dr. Anvay Mulay. Recipient was 22 yrs who suffered a stroke because of cardiomayopathy and later his heart got failure. Donor was 42 year old woman declared brain dead in Pune after brain stroke. Donated organ flown from Pune was rushed 20 km to a Mulund hospital along a green corridor created during peak hours by the police in as little as one-fifth of the usual time. The operation took five hours and now the patient's new heart is beating and his kidney and liver that had got affected in the last few months after heart failure showed the signs of normalcy.



Liver transplantation: Liver transplantation is a very effective form of treatment for chronic liver disease as well as for acute liver failure. Living Related Liver Transplantation (LRLT) is an important advancement in liver transplantation. Generally liver transplantation is done in Cholestatic disorders and chronic parenchymal diseases. There are three types of liver transplantation viz., coventional liver transplantation, expanded criteria donor and living donor liver transplantation.

- **Conventional liver transplantation:** This type of liver transplantation is performed to replace the diseased liver with healthy liver from deceased person
- **Expanded Criteria donor:** In this type the donor are over the age of 60, or a donor over the age

of 50 with two of the following: a history of high blood pressure, a creatinine (blood test to show kidney function). The term "expanded" is used because an expansion of the donor pool is considered to increase transplantation.

- **Living donor liver transplantation (LDLT):** In this type of liver transplantation healthy living person donates a portion of his liver to the recipient.

Lung Transplantation: Lung transplantation is a surgical procedure in which a patient's diseased lungs are partially or totally replaced by the donor's lung. Some of the diseases due to which lung transplantation favored are chronic obstructive pulmonary disease, Idiopathic pulmonary fibrosis, cystic fibrosis and idiopathic pulmonary hypertension. Generally there are three types of lung transplantation.

- **Single lung transplant:** Single donated lung comes from the brain dead donor.
- **Double lung transplant:** In this type both the lungs are transplanted especially in case of cystic fibrosis.
- **Heart-lung transplant:** In severe cardiac disease both heart and lungs have been transplanted.

BIOLOGY IN HUMAN WELFARE

Animal Husbandry

It deals with the care, breeding & management of domesticated animals that are useful to humans.

Poultary Farming

- Poultary is a rearing of domesticated fowls, ducks, geese turkeys guinea fowls and pigeons.
- Poultry birds exclusively grown for meat are called broilers, layers are for egg production, cockerel for young male fowls and rooster are mature male fowls.

Fisheries

- **Pisciculture** is the rearing, breeding and catching of fishes.
- **Aquaculture** is rearing and management of useful aquatic plants and animals like fishes, oysters, mussels and prawns etc.

Apiculture

- Apiculture is rearing and breeding of honeybees for the production of honey. It also produces beeswax and bee pollen. Beeswax is used for the preparation of cosmetics and polishes of various kinds.
- The commonest species of honeybee is Apis indica.

Animal Breeding

- Animal breeding is the production of new breeds of domesticated animals with improved traits. Breeding is the modification of genotype of an organism to make that organism more useful to human.
  - ➢ Inbreeding: Mating between the closely related animals of same breed.
  - ➢ Out-breeding: Mating between the animals which are not closely related.
  - ➢ Out-crossing: Mating between the animals of the same breed which do not have a common ancestor.

- Cross-breeding: Mating between the superior animals of different breeds of the same species.

- MOET (Multiple Ovulation Embryo Transfer) technique is a programme which improves the chances of successful production of hybrids.

Plant Breeding

- **Plant breeding** refers to the modification and improvement of genetic material of plants resulting in the development of crops which are more beneficial to human beings.

Crop	Variety	Resistance to diseases
Wheat	Himgiri	Hill bunt & leaf and stripe rust
Cauliflower	Pusa snowball K-1 Pusa shubra	Blight black rot Black rot and curl
Brassica	Pusa Swarnim (Karan rai)	White rust
Cowpea	Pusa Komal	Bacterial blight
Chilli	Pusa Sadabahar	Chilly mosaic virus, Tobacco mosaic virus and leaf curl.

Table : Crop varieties bred by hybridization and selection for disease resistance to fungi, bacteria and viral disease.

- Examples of insect pest resistance crops bred by hybridization are
  (i) **Pusa Gaurav** variety of Brassica is resistant to aphids.
  (ii) **Pusa Sawani and Pusa A-4** varieties of Okra (Bhindi) are resistant to shoot and fruit borer.
  (iii) **Pusa sem 2** and **Pusa sem 3** varieties of flat bean are resistance to aphids and fruit borer.

Biotechnology and its application

- It deals with large scale production and marketing of products and processes using living organism, cells or enzymes. This technology has application in agriculture, food processing industry, bioremediation, medicine diagnostics, waste treatment and energy production.
- Biotechnology deals with:
  - Microbe-mediated processes (making curd, bread, wine etc.)
  - In vitro fertilization ('test tube' baby programme)
  - Synthesis and using of gene
  - Preparation of a DNA vaccine
  - Correcting a defective gene

Genetically Modified Plants	
1. Golden Rice	It is a genetically modified variety of Rice, Oryza sativa which has been developed as fortified food for areas where there is shortage of dietary vitamin A.
2. Bt Cotton	Bacillus *thuringiensis* forms protein crystals during the particular phase of their growth. These crystals contain a toxic insecticidal protein. BT toxin gene were isolated from B. *thuringiensis* and genetically transferred to several crop plants such as cotton.

3. Flavr savr variety of tomato	Flavr savr is the first genetically engineered crop in which tomatoes have longer shelf life.
Benefits of Transgenic Animals	
1. Transgenic animals are used to study gene regulation	Study of insulin-like growth factor helps to study the biological role of the factor in the body.
2. Biological products	(a) Human protein (α-1-antitrypsin) used to treat emphysema.
	(b) Protein for the treatment of Phenylketonuria (PKU) and cystic fibrosis etc.

DISCOVERIES IN BIOLOGY

- **Willaim Harvey** discovered the double circulatory system of blood also known as Systemic Circulation.
- **Marcello Malpighi** discovered the link between arteries and veins.
- **Louis Pasteur** and **Joseph Lister** discovered role of microorganism in causing infectious diseases.
- **Daniel Nathens** and **Hamilton Smith** discovered Restriction endonuclease enzyme used in Genetic engineering.
- **Hargovind Khorana** showed the order of nucleotides in nucleic acid and also shared Noble prize for Physiology or Medicine with Marshall **W. Nirenberg and Robert W. Holley**.
- Viroids were discovered by **T.O.Diener.**
- **Stanely Prusiner** did most of the work on Prions and was awarded Noble Prize in 1998.
- **Nerinberg** and **Philip Leder** discovered the triplet nature of the genetic code.
- **Edward Jenner** first time demonstrated the vaccination against the small pox in year 1798.
- **George Kohler and Cesar Milstein** discovered the monoclonal antibodies.
- **Francis Crick and James Watson** discovered the double helical structure of DNA molecule in year 1953.
- **Matthias Jacob Schleiden and Theodor Schwann** (1939) proposed the Cell theory.
- **Van Niel** postulates that in green plants, water is utilized in place of H_2S and O_2 evolved in place of sulphur and this discovery was confirmed by **Ruben and Kamen** in 1941 using Chlorella, a green alga.
- Brtish Scientist **Arthur Tansley** coined the term ecosystem which was later adopted by **Eugene Odum**.
- **Morgan** in 1910, showed that genes reside on specific chromosomes

HEALTH GUIDE

CALORIE CHART

Food Categories	Measure	Calories
MILK & MILK PRODUCTS		
Milk (Cow)	90 ml	50
Milk (Buffallo)	45 ml	50
Cheese	15 gms	50
Butter	1 tbsp	50
Ghee	1 tbsp	50
FRUITS		
Apple	1 small	50-60
Banana	½ Medium	50-60
Grapes	20 small	50-60
Mango	1 small	50-60
Musambi	1 Medium	50-60
Orange	1 small	50-60
CEREAL		
Cooked Cereal	½ Cup	80
Rice Cooked	25 gms	80
Chapatti	1 Medium	80
STARCY VEGETABLES		
Potato	1 Medium	80
Dals	1 Large Katori	80
Mixed Vegetables	150 gms	80
PROTEIN / MEAT		
Fish	50 gms	55
Mutton	1 oz	75
Egg (Hen)	2 pieces	100
COOKED FOOD		
Biscuit (Sweet)	15 gms	70
Cake (Plain)	50 gms	135
Cake (Rich Chocloate)	50 gms	225
Dosa (Masala)	1 Medium	120
Pakoras	1 Medium	175
Puri	1 Large	85
Samosa	1 Piece	140
Vada (Medu)	1 Small	70
MAIN DISH		
Biryani (Mutton)	1 Cup	225
Biryani (veg.)	1 Cup	200
Curry (Chicken)	100 gms	225
Curry (Veg.)	100 gms	130
Fried Rice	85 gms	140
Pullao (Veg.)	100 gms	130
SWEET DISH		
Carrot Halwa	50 gms	300
Jalebi	20 gms	100
Kheer	100 gms	180
Rasgulla	150 gms	140
BEVERAGES		
Beer	12 Fl. oz	150
Cola	200 ml	90
Wine	3.5 Fl. oz	85

HEIGHT & WEIGHT CHART

Height Cms	Weight Kgs	Height Cms	Weight Kgs
[+] Men		[+] Women	
157.5	53.5-57.1	147.5	43.5-48.5
160.0	54.8-60.3	150.0	44.4-49.9
162.5	56.2-61.6	152.5	45.8-51.2
165.0	57.8-63.0	155.5	47.1-52.6
167.5	59.0-64.8	157.5	48.5-53.9
170.0	60.7-66.6	160.0	49.9-55.3
172.5	62.6-68.9	162.5	51.2-57.1
175.0	64.4-70.7	165.0	52.6-58.9
178.0	66.2-72.5	167.5	54.4-61.2
180.0	68.0-74.8	170.0	56.2-63.0
183.0	69.8-77.1	172.5	58.0-64.8
185.5	71.6-79.3	175.0	59.8-66.6
188.0	73.4-81.6	178.0	61.6-68.4
190.5	75.7-83.9	180.0	63.5-70.3
193.0	78.0-86.1	183.0	65.3-72.1

[+]For Medium Frame Persons

Everyday Science

1. **Why does a ball bounce upon falling?**
   When a ball falls, it is temporarily deformed. Because of elasticity, the ball tends to regain its original shape for which it presses the ground and bounces up (Newton's Third Law of Motion).
2. **Why is standing in boats or double decker buses not allowed, particularly in the upper deck of buses?**
   On tilting the centre of gravity of the boat or bus is lowered and it is likely to overturn.If you stand in a boat, you change the center of gravity making the boat more likely to roll if struck by a wave and if you stand up on the second deck of a double decker bus (which has no roof) and are looking at where you've been, you probably won't see that low bridge ahead of you.
3. **Why is it recommended to add salt to water while boiling dal?**
   By addition of salt, the boiled point of water gets raised which helps in cooking the dal sooner. Salt is added to improve the taste; also sodium is indispensable for the life.
4. **Why is the sky blue?**
   A clear cloudless day-time sky is blue because molecules in the air scatter blue light from the sun more than they scatter red light. When we look towards the sun at sunset, we see red and orange colours because the blue light has been scattered out and away from the line of sight.
5. **On the moon, will the weight of a man be less or more than his weight on the earth?**
   Since the moon is smaller than Earth, it has a weaker gravitational pull. In fact, the moon only has 1/6 the gravity that Earth does. This means you weigh six times less on the moon than you do on Earth!
6. **Why can we see ourselves in a mirror?**
   We see objects when light rays from them reach our eyes. As mirrors have a shiny surface, the light rays are reflected back to us and enter our eyes.
7. **Why is cooking quicker in a pressure cooker?**
   The trapped steam increases the atmospheric pressure inside the cooker by 15 pounds per square inch (psi), or 15 pounds above normal sea-level pressure. At that pressure, the boiling point of water is increased from 212°F to 250°F. This higher temperature is what cooks food faster. The trapped steam increases the atmospheric pressure inside the cooker by 15 pounds per square inch (psi), or 15 pounds above normal sea-level pressure. At that pressure, the boiling point of water is increased from 212°F to 250°F. This higher temperature is what cooks food faster.
8. **Ice wrapped in a blanket or saw dust does not melt quickly. Why?**

Both wood and wool are bad conductors of heat. They do not permit heat rays to reach the ice easily.

9. **Why does a balloon filled with hydrogen rise in the air?**
   Since the density of hydrogen is lower than that of the air, balloon will go up in the air
10. **Why does an electric bulb explode when it is broken?**
    The bulb is a partial vacuum and as it breaks, air rapidly enters in resulting in a small explosion.
11. **Why do we lean forward while climbing a hill?**
    We lean forward while climbing up a hill, so that the vertical line drawn through the center of the gravity of the body should fall within the base.
12. **Why does a man fall forward when he jumps out of a running train or bus?**
    When the person is sitting inside a train, his complete body was in a state of motion with the train. The moment he jumps out of the moving train, his feet touches the ground, and the lower portion of his body comes to rest. But the upper portion remains in motion due to inertia of motion. That's why he falls in the direction of motion of the train.
13. **Why does an ordinary glass tumbler crack when very hot tea or milk is poured in it?**
    The crack is caused by differential thermal expansion. The part of the glass that the boiling water touches first expands due to the heat, but the heat doesn't conduct through the glass quickly so there is stress between the expanded inside of the glass and unexpanded outside of the glass. This stress is sometimes too much and the glass cracks.
14. **Why is a compass used as an indicator of direction?**
    The compass needle aligns with the Earth's magnetic field direction and points north-south.
15. **Why is water from a hand pump warm in winter and cold in summer?**
    In winter the outside temperature is lower than that of water flowing out of the pump, and therefore , the water feels warm. Whereas in summer, the outside temperature is higher than the water of the pump, and therefore, it feels cold.
16. **Why does a swimming pool appear less deep than is actually is?**
    The refraction of light at the surface of water makes ponds and swimming pools appear shallower than they really are.
17. **Why is one's breath visible in winter but not in summer?**
    Absolute dew point in cold weather is lower than in warm weather. water from your breath condenses and freezes in cold weather.
18. **Why does water remain cold in an earthen pot?**
    In an earthen pot, water gets evaporated quickly through the pores. Cooling is caused by evaporation
19. **Why do we place a wet cloth on the forehead of a patient suffering from high temperature?**
    Water evaporating from the wet cloth produces a cooling effect and brings the temperature down.

20. To prevent multiplication of mosquitoes, it is recommended to sprinkle oil in the ponds with stagnant water. Why?
Mosquitoes breed in stagnant water. The larvae of mosquitoes keep floating on the surface of water due to surface tension. However, when oil is sprinkled, the surface tension is lowered resulting in drowning and death of the larvae.

21. Why is it dangerous to sleep under trees at night?
Because plant on respiration gives CO_2, because the absence of light. So in nights if we sleep under big trees we do not have sufficient amount of oxygen.

22. Why is a new quilt warmer than an old one?
A quilt feels warm because the air trapped in the cotton or woolen batting acts as an insulator and does not allow the heat of the body to escape. However, when the quilt gets old - the cotton/wool gets compressed and the airspace are done away with. It does not remain as good an insulator to heat as it was earlier. Hence it feels less warm.

23. How do bats fly in dark?
In dark, bats' ears are more important than their eyes - they use a special sonar system called 'echolocation,' meaning they find things using echoes.

24. Water pipes often burst at hill stations on cold frosty nights. Why?
The temperature may fall below 0°C during cold frosty nights which converts the water inside the pipes into ice, resulting in an increase in volume. This exerts great force on the pipes and as a result, they burst.

25. Why are white clothes more comfortable in summer than dark or black ones?
White clothes are good reflectors and bad absorbers of heat, whereas dark or black clothes are good absorbers of heat. Therefore, white clothes are more comfortable because they do not absorb heat from the sun rays.

26. Why does a rose appear red grass green in daylight?
The rose absorbs all the other color light and reflects or gives out red so we see it in red color. Simliar is the condition with grass, Green grass absorbs blue and red light, but reflect green light. So it is the reflected light which gives color what we see.

27. If a highly pumped up bicycle tyre is left in the hot sunlight, it bursts. Why?
The air inside the tube increases in volume when heated up. As sufficient space for the expansion of the air is not available because the tube is already highly pumped, it may result in bursting of the tyre.

28. What will be the color of green in blue light?
Grass will appear dark in color because it absorbs all other colors of the light except its own green color. The blue light falling on grass will be absorbed by it, and hence, it will appear dark in color.

29. Why do two eyes give better vision than one?
Because two eyes do not form exactly similar images and the fusion of these two dissimilar images in the brain gives three dimensions of the stereoscopic vision.

30. When a man fires a gun, he is pushed back slightly. Why?
Newton's 3rd law says 'Every action has an equal and opposite reaction'.. So when a man fires in forward direction, he is generating a force on the gun. As a result of that action the gun returns the force.. Or make a reaction in the backward direction..Hence, the man is pushed back slightly.

31. Why is a small gap left at the joint between two rails?
The gap in the joint between two rails is to compensate for the expansion of the material of rail during summer.

32. Who will possibly learn swimming faster—a fat person or a thin person?
The fat person displaces more water which will help him float much more freely compared to a thin person.

33. Why is a flash of lightening seen before thunder?
We see the lightning before we hear the thunder because light travels faster than sound. The light from the lightning travels to our eyes much quicker than the sound from the lightning. so we hear it later than we see it.

34. Why are ventilators in a room always made near the roof?
The hot air being lighter in weight tends to rise above and escape from the ventilators at the top. This allows the cool air to come in the room to take its place.

35. A burning candle gets extinguished when covered with a tumbler. Why ?
Fire needs oxygen to burn and when the tumbler covers the fire it uses up all the oxygen in the little space quickly and is extinguished.

36. A parachute enables a person to descend in safety in case of an accident to aircraft ?
A man falls to the earth because of the gravitational pull of the earth. The parachute offers considerable resistance to that gravity, thereby slowing down the speed of the descending man. The parachute thus enables a person to descend in safety.

37. Why does tea cool more rapidly in a saucer than in a cup ?
Cooling is caused by evaporation. In a saucer evaporation takes place more rapidly than in a cup.

38. It is advisable to work electric appliances when they are earthed suitably. Why ?
In case of short-circuiting, the current passess to the earth without harming the user, if an electrical appliance is properly earthed.

39. Explain why the planets do not twinkle.
Planets are much closer to earth as compared to stars. They are extended source of light. They behave like a number of point sources so that the average variation is zero. Thus, planets do not twinkle.

40. Why does the Sun appear reddish early in the morning?
In the morning, the sun is nearer to the horizon. Blue light have shorter wavelength, so, it scatters more. Therefore the red light which have longer wavelength reaches upto the eye of the observer and the sun appears reddish.

41. Which is more elastic, rubber or steel?
Steel is more elastic for the same stress produced, compared to rubber.

42. Why do some liquids burn while others do not?
A liquid burns if its molecules can combine with oygen in the air with the production of heat. Hence, oil burns but water does not.

43. Why do we bring our hands close to the mouth while shouting across to someone far away?
By keeping hands colose to mouth the sound is not allowed to spread (phenomenon of diffraction of sound) in all directions but is directed to a particular direction and becomes louder.

44. Why does silver acquires a blackish tinge when exposed to air for a long time?
Silver on exposure to air acquires a blackish tinge due to the formation of silver sulphide.

45. In chilled winters the nose and ears turn red. Explain the advantage of this response?
In cold days, skin blood vessels of the ears and nose can dilate, bringing warm blood to the ears and nose, to prevent the tissue damage from cold. The increased blood flow makes the ears and nose appear red.

46. What would happen if the force of gravity were to disappear suddenly?
In the absence of the force of gravity all living objects on the earth will be practically in a floating condition. They will be thrown away because of the centrifugal force caused by the rotation of earth. Thus, one will not be able to eat, drink, move and continue to live.

47. When we drink soft drink through a straw, why does the liquid go up into our mouth?
When a person sucks air from the straw, the pressure of air inside the straw is reduced as compared to the atmospheric pressure acting on the surface of the liquid. Therefore, the soft drink rushes up into the straw and to the mouth.

48. Explain why it takes more time to cook meat and vegetables at hill stations.
The boiling point of water depends upon the pressure on its surface. It increases with the increase of pressure and decreases on lowering of pressure. At higher altitudes, the atmospheric pressure is low as compared to that in the plains, therefore, water boils below 100°C. Hence, sufficient heat is not supplied for cooking the meat and vegetables at hill stations. This difficulty may be overcome by using a pressure cooker. Water can be made to boil at any desired temperature with the help of this appliance.

49. Why does blotting paper absorb ink?
Blotting paper has fine pores which act like capillaries. When a portion of blotting paper is brought in contact with ink, ink enters the pores due to surface tension (capillary action of liquids) and is absorbed.

50. Why does kerosene float on water?
Because the density of kerosene is less than that of water.

51. Why is a metal tyre heated

before it is fixed on wooden wheels?
On heating, the metal tyre expands by which its circumference also increases. This makes fixing the wheel easier and thereafter cooling down shrinks it ; thus fixing the tyre tightly.

52. Why is it easier to swim in the sea than in a river?
The density of sea water is higher; hence the upthrust is more than that of river water.

53. Why does oil rise on a cloth tape of an oil lamp?
The pores in the cloth tape suck oil due to the capillary action of oil.

54. Why are air–coolers less effective during the rainy season?
During the rainy reason the atmospheric air is saturated with moisture. Therefore, the process of evaporation of water from the moist pads of the cooler slows down thereby not cooling the air blown out from the cooler.

55. Why does grass gather more dew in nights than metallic objects such as stones?
Grass being a good radiator enables water vapour in the air to condense on it. Moreover, grass gives out water constantly (transpiration) which appears in the form of dew because the air near grass is saturated with water vapour and slows evaporation. Dew is formed on objects which are good radiators and bad conductors.

56. Why is it dangerous to have charcoal fire burning in a closed room?
When charcoal burns it produces carbon monoxide which is suffocating and can cause death.

57. Why does ENO's salt effervesce on addition of water?
It contains tartaric acid and sodium bicarbonate. On adding water, carbon dioxide is produced which when released into water causes effervescence.

58. Eskimos live in double-walled ice houses. Why?
Because the air in between two ice walls does not allow heat to pass.

59. Why is sunlight so hot and moonlight so cool?
The Sun is millions of times brighter than the Moon. All of the Moon's light is just scattered sunlight; it does not emit any light of its own. The fact that we can discern objects in moonlight is due to the remarkable capacity of our eyes to adjust to extremely low levels of light. Of course, moonlight differs from sunlight in its basic character as well; it also depends on the scattering properties of the Moon surface.

60. What is DNA finger printing? what are its uses?
The sequence of bases of DNA in each of our cells is the same, but differs from that of any other living thing except possibly an identical twin. This difference makes the DNA break at different places when certain proteins called enzymes are added to it, resulting in smaller DNA fragments of different sizes. These fragments migrate at different rates in an electric field, resulting in a unique pattern; this pattern is referred to as a DNA fingerprint. Our DNA is inherited from our

parents. Some parts come from the father and some from the mother. DNA fingerprinting can help identify parentage, since a son or daughter would always exhibit a pattern identifiable as coming from both parents. DNA fingerprinting analysis is very useful in forensic science; from a single hair or a tiny sport of blood, it is possible to prove the innocence or guilt of a murder suspect. Similarly, it is also possible to identify human remains after violent accidents have caused disfigurement.

61. How does cooking happen in a microwave?

Passage of microwaves through food results in increased agitation of molecules. If we can increase the amplitude of the random movements of molecules, we are doing nothing but heating the food. But how do microwaves increase the agitation? At microwave frequencies, the alternating electric field of the radiation interacts with the electric dipole moment of water molecules, making them vibrate faster. The absorption length of the microwave energy is long, meaning that not all energy falling on a chunk of cooking food gets absorbed while traversing through it. It also means that for microwaves, in the simplest approximation, there is no inside or outside of the food chunk; heating occurs all through the body of the food. That is the reason you do not get a crisp surface on the outside, as you would in normal cooking where the heat has to travel inwards from outside.

62. If you press the upper lid of one of your eyes you see two images. Why?

The two eyes send independent image signals to the brain, which has the mechanism to combine them to give the sensation of a single 3D image. When we press on one eyelid, we are essentially tilting its lens, and therefore moving the image on the retina. The brain remains unaware and two visualised images are the result of improper superposition.

63. Why does an air conditioner " leak" water?

An air conditioner sucks in the outside air and passes it over fin-like projections, which have been cooled by the compressor. It cools the inside of a room while heating the outside. The outside air is not only hot but often it is also quite humid. When passed over the cold fins, the temperature of air drops below the dew point and excess moisture condenses out.

64. Why do stars twinkle and the planets do not?

Starlight passes through the atmosphere before reaching us. If the air above us were a passive, well-behaved and completely homogenous medium. we will not have any twinkling. Fortunately for us, our atmosphere is active and vibrant. Air masses are always on the move. It is natural, therefore, that there would be pockets of slightly higher density, and others of slightly lower density, flitting around. Starlight passing through these pockets is minutely deflected higher and thither.

To an observer, the star will seem to come into view and then disappear, many times a second. We poetically refer to this phenomenon as twinkling.

On the other hand, planets are not point objects like stars. A spatially extant bundle of rays comes to us from various parts of the planet surface and there never is a time when all the rays are bent out of our eye. Therefore, where planets are concerned, we do not see any twinkling.

65. How is it possible for insects and spiders to walk on water or on the walls?

Tiny insects can walk on water because of the phenomenon of surface tension. The unbalanced intermolecular force makes the surface behave like a stretched membrane. The classical demonstration of the carrying capacity of this membrane is to gently lay flat a shaving blade (to ensure that the weight per unit area is kept low) upon the surface of still water; the blade does not sink. The blade is heavier than an equal volume of water and would surely sink if the force of surface tension were absent. Thus, one can easily understand why little insects and larvae can float on the surface of water.

As regards the ability of insects to walk on walls, several explanations are provided. The most popular is the hypothesis that such creatures have suction cups on their feet using which they can stick to walls and ceilings. Some recent investigations indicate a special construction of the feet; thousands upon thousands tiny, protruding hair-like projections stick to surfaces due to good old molecular forces.

66. What are the benefits of using GSLV to launch satellites into geostationary orbit?

Communication satellites are usually placed in a geo-stationary orbit. This is an orbit over the equator at a height such that the period of revolution of the satellite around the Earth is exactly the same as the period of rotation of the Earth - namely 24 hours. The advantage is that the satellite in such an orbit appears to be stationary with respect to the Earth. The communication antennas on the ground can then be pointed in a fixed direction without worrying about the rotation of the Earth. We already have several such satellites providing communication, including television broadcast and networking services. The demand for such services is continuously increasing. Therefore, we do need more satellite transponders in orbit. We also need to replace satellites that are close to the end of their lives.

So far, we have depended on European or American launchers to raise our satellites into the geo-stationary transfer orbit. However, we are now beginning to use our own launch vehicle. Some of the rocket stages and associated technologies already developed for putting satellites in polar orbits around the Earth (for remote sensing) were upgraded and modified for GSLV (Geo-stationary Satellite Launch Vehicle). A new rocket stage using liquid hydrogen and liquid oxygen was added, in

addition to other modifications in the launch systems previously developed for polar launches.

67. What is the use of the glass sheet in a solar cooker?

To raise the temperature within, a solar cooker you have to allow maximum possible energy from sunlight to come in and lose the least amount through re-radiation to the environment. Most of the Sun's energy is concentrated in the visible range of radiation. A glass sheet is transparent in this range, so it allows a large fraction of the Sun's energy to enter the cooker. The temperature inside the cooker may rise to 100 degrees Celsius, at the most. At this temperature, most of the radiation is in the infrared range; in other wards, it is heat radiation. Glass is not very transparent at these wavelengths. This radiation is trapped inside the cooker, thus raising the temperature. Of course, ultimately, the energy going out must become equal to the energy coming in. This balance is achieved only after the cooker temperature has been elevated.

68. Is it true that body weight increases after death?

A dead body is heavier to carry, much like a person who is unconscious or drunk. The perception is probably due to the fact that a dead person does not cooperate in distributing his weight on to different parts of your body - for example, by putting an arm around your shoulder or clasping his legs around your middle. After a while, the remains of a dead body must weigh much less because much of the body degrades through the action of bacteria.

69. Water is colourless, water vapour is colourless, so why are clouds white or black and not colourless?

You must have noticed that clouds are not only white or black; at sunrise or sunset, they are also pink and red. This is because the colour of the cloud is dominated by the light that is scattered from the surface of a large number of tiny droplets. That colour is the same as that of the light falling on them. During the day when the sun is up, it is the scattered light that filters through; after many scatterings of water droplets. This makes the clouds white. When the sky is almost covered with thick clouds, little of the scattered light from the cloud comes down, and the dark colour of the clouds is due to absence of light.

70. Why does the Universe appear black to us?

From out in space, the Universe does look black except for the stars and galaxies with which it is studded. This is so because no visible light is scattered in our direction from positions and directions that do not have a star.

71. Why do we dream?

The phenomenon of dreams has been studied in detail by many experts. There are a large number of books on this subject.

It is clear that our body needs sleep; the brain and the central nervous system need rest. We also know that our brain, does not shut down while we are asleep. There is an enormous amount of delegation of power and autonomy. We do not stop breathing when we are sleeping. The heart rate might

slow down a bit, yet it's beat keeps our blood flowing; our digestive system keeps working as well. Many of our senses are given a holiday and yet kept on alert should there be a need to take action. There are a lot of images and stories residing in some structures of the brain. When we are awake, these are under conscious control. On the other hand, when we fall asleep, they are still present but they are unsupervised and have some freedom to combine in odd ways, often responding to strong experiences - some very recent and others very old, fished out from the bottom of the storage file. The editing and serialisation of images and thoughts might seem random but even the randomness seems to have some logic. Those impulses that are suppressed while we are awake become free to operate and be experienced.

72. Why does hair stand on end on a chilly morning?

When it is cold the body reduce the loss of heat, particularly due to evaporation. This is due to closing of the pores on the skin tends to make the hair stand up like little poles.

73. Why does the rain fall in drops?

Rain is the result of condensation of vapour when the air is cooled below the dew point. All the vapour in a cloud cannot condense at the same time and turn into a large pool of water. Pockets of air move up independently and slowly cool till condensation begins and water droplets form. It is believed that most raindrops start out as tiny ice crystals - so tiny that they float down, slowly accreting more moisture on the way; at lower altitudes, the crystals melt into water droplets. In colder climates, the crystals reach the ground as snowflakes.

74. Is there a method of counting all the stars of the Universe?

We can't even see all the stars. Some are hidden by dust clouds, many more are in galaxies so far away that they cannot be resolved as separate entities even by the most powerful of telescopes. So how do we say that there might be a hundred billion stars in our galaxy and a hundred billion galaxies? Not by counting, but by estimating on the basis of sample counts in some small representative parts of the Universe. For example, for some parts of our own galaxy, we might count the stars in a tiny bit of an angle of view. Then it becomes a problem of repeating this exercise on selecting representative bits of the sky in all directions and doing the same. What remains then is to estimate the total volume in various representative bits.

75. Why do clouds look reddish-orange in the evening?

In the late evening, when it begins to get dark on the Earth's surface, the clouds can still catch the Sun's rays for a while longer, since they are high up. But, to reach the clouds, the rays of the Sun have to pass through the atmosphere almost tangentially. This distance travelled through air is therefore very large. You This long path through air leads to excessive molecular scattering. Orange and red light scatters away much less than the blue and green colours. Therefore, the clouds are illuminated by light that appears mainly orange-red.





ECOLOGY AND ENVIRONMENT

ECOLOGY

Ecology is a distribution and abundance of living organisms and their relationship with environment. It is a branch of biological science.
There are four basic concepts of ecology which are as follows:

- **Holism**: is a philosophy term which conceived as a directive and creative principle operating from initial to last level in ecology.
- **Ecosystem**: involve both the living and non-living factors working together, working in a complex web.
- **Succession**: the living organisms and its environment commonly reactive and influence each other in different ways. Increase in the capacity of tolerance towards changing environment by modifying their environment as the process of growth, dispersal, reproduction, death and decay follows changing the abiotic component of ecosystem is called as succession.
- **Conservation:** Regulation of the population through naturally-operating trophism ensures resilience of the system.

Realm of Ecology

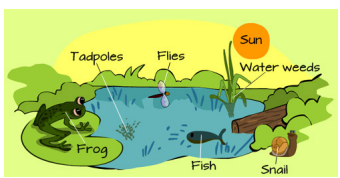
ecology as a basic division of biology explains patterns within and among organism. The hierarchical level of ecology is shown below.

- **Biosphere**
- **Ecosystem**
- **Communities**
- **Population**
- **Organism**

Biosphere

The global conglomeration of all the ecosystem i.e. a zone where all the living organisms on earth together with the dead organic matter produced by them exist. It is the key component of earth systems, intermingle with and exchange matter and energy with the other spheres, helping to drive the global biogeochemical cycling of carbon, nitrogen, phosphorus, sulfur and other elements. It includes the lithosphere, hydrosphere, atmosphere and other "spheres" (e.g. cryosphere, anthrosphere, etc.).

Ecosystem



Ecosystem is defined as a specific and recognizable landscape such assuch as forest, wetland, coastal area, grass lands, deserts etc having both living and non living elements

Components of Ecosystem

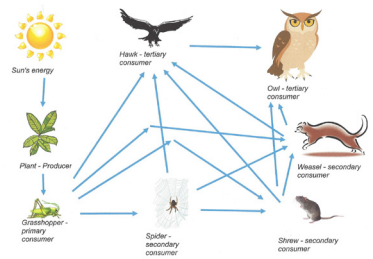
- **Abiotic components** are the non-living elements of an ecosystem as air, water, climate and soil etc containing both organic and inorganic matters.
- **Biotic components** consist of all the living community of plants and animals in any area togetherwith the non-living components of the environment such as soil, air and water.

Function of Ecosystem

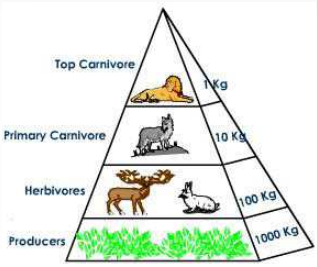
The function of ecosystem can be referred a producer consumer arrangement of nutrients known as **energy cycles**and each food level of this pyramid is known as **trophic level.** The three major aspects of energy cycles are food chain, food web and ecological pyramids.

Food chain is a chain or series of feeding relationship among different living things in a particular environment or habitat. Plant is always the first step of food chain as it produces its own food from non living things and eventually eaten by the next higher level of living orgasm such as herbivores who only takes plant as their food item.The plants are the known as producers and the animal depend upon producers are known as primary consumer. The next level in this hierarchy is known as secondary consumer who depends on primary consumer for food.

Food Web is defined as the system of interlocking and interdependent food chains.



Energy Pyramid is a graphical presentation of the trophic levels in an ecosystem where the energy from the sun is transferred through the ecosystem by passing through various trophic levels. Only 10% of energygets transferred from one trophic level to the next.



Energy Flow in Ecosystem

- Ecosystem obtains energy from sun, which, is trapped by producers via photosynthesis and is converted into chemical energy.
- The chemical energy is converted into mechanical and heat energy in cellular activities.
- Energy enters is the ecosystem as light and exits as heat.
- Energy flows in a one way direction through ecosystem i.e. not recycled
- Herbivores are primary consumers and can store only 10% of producers's energy in their biomass and they use the remaining 90% in life activities.
- In the same way carnivores store only 10% of the stored energy of herbivore.

Types of Ecosystem

Ecosystems are classified on the basis of climate, habitat and plant communities.

- **Aquatic ecosystem :** The aquatic ecosystem has been classified in a number of ecological ways. On the basis of salt content in water they are further divided into fresh water, estuarine and marine ecosystem.
- **Terrestrial ecosystem :** It is futher divided into Forest, Grassland, Desert ecosystem and artificial ecosystems such as crop fields, gardens etc.

Aquatic Ecosystem

On the basis of salt content in water they are further divided into:

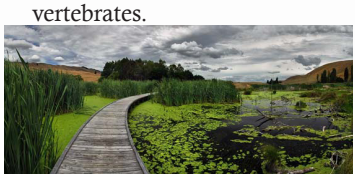
- Wet lands
- Estuarine and
- Marine ecosystem.

Wetlands

- Wetlands are lands which, due to geological or ecological factors, have a natural supply of water – either form tidal flows, flooding rivers, connections with groundwater, or because they are perched above aquifers.
- Wetlands are coverd or soaked for at least a part, and often all, of the year and thus are intermediaries between terrestrial and aquatic ecosystems.
- The periodicity of water level fluctuations is termed as hydroperiod and it is the key factor that determines the productivity and species composition of the wetland community.
- Generally low lying areas, covered by shallow water and have charachteristic soils and water toierant vegetation.
- Wetlands occupy only 2 per cent of the surface area of earth and they are estimatted to contain 10 to 14 percent of carbon.
- They may be either freshwater or salt water (coastal).
- Man made wetlands : paddy fields, fishery ponds, Trapa & Euryale cultivation ponds and other aquaculture habitats.

Significance of Wetlands

- Nutrient rich and have high primary productivity.
- Since they have both aquatic and semi-aquatic environmental conditions so support specialized vegetation and fauna. Often a prime breeding habitat for waterfowl, many migratory birds and other aquatic or semi aquatic vertebrates.



- Helps in controlling flood by holding excess water, and the flood water stored in wetlands then drains slowly back ino the rivers, providing a steady flow of water throughout the year.
- Serve as groundwater recharging areas.
- Provide important commercial products, including wild rice and various types of berries (such as black berries, blue berries etc.).
- Hold sediments and accumulate soil slong the shoreline.
- National Wetland Conservation Programme(NWCP) has been initiated for indentified wetland which are at present 66 covering 21 states.

Estuaries

- An estuary (from Latin aestus, "tide") is a semi-enclosed coastal body of water, which has a free connection with the open sea.
- Nutrients from the river enrich estuarine waters, making estuaries one of the most biologically productive environments on earth and thus have more biodiversity in unit area.
- It is strongly affected by tidal action which is an important physical regulator and an energy subsidy.

- Variability is a key characteristic of most of the estuaries. Since temperature and salinity varies spatially within estuaries, from nearly that of fresh water to that of the ocean and also on a daily cycle with the rise and fall of the tides so tha organisms inhabiting such habitats are eurythermal and euryhaline.
- They are transitional zones/ ecotones between the freshwater and marine habitats.
- Examples include river mouths, coastal bays tidal marshes and bodies of water behind barrier beaches and extensive interidal mudflats or salt marshes often border them.
- They are considered in a "youthful" stage with regard to their productivity and often generate more fertility than they can use (P exceeds R), resulting in the export of nutrients and organic detritus into the ocean.
- Outwelling : Movement of nutrient rich estuarine water out to the sea.
- Estuary provides the "nursery grounds" for most coastal shellfish and other fishes. e. g. Several kind of commercially important shrimp live and spawn as adults offshore and come into the estuaries as larvae. Fishes such as salmon and eels also depend on estuaries where they may reside for considerable lengths of time during their migrations from salt to fresh water.
- Estuaries are also crucial feeding areas for many semi-aquatic vertebrates, particularly wtaerfowl.

Mangroves

- Found in tropical and sub tropical land - sea ecotones.
- They are potential "land builders" that help to form islands and to extend seashores.
- On the basis of salinity, five zones of mangrove distribution are considered, namely euhaline, polyhaline, mesohaline, oligohaline and limnetic zones.
- Indian coastline covers about 7500km and it accounts for 8% of the world's mangrove area which is approximately 700,000 ha.
- The Gulf of kachchh & the Gulf of khambhat constitute the major mangrove zones of the Gujarat Coast.

Significance of Mangroves:

- Mangroves perform a variety of productive as well as protective functions. The resilient mangroves protect the hinterland against cyclonic storms during cyclones, super cyclones, and ingress of seawater during tidal surges and other natural catastrophes acting as an effective shelterbelt.



- Are considered as "land builders". It is belived that the roots of mangroves secretea substance, which modifies the

coarse particles into fine ones and help in soil formation. The tangles of stilt roots also trap the sediments.

- Support a range of interconnected food webs, which directly sustain the fisheries. Algae and detritus sustain shrimps and prawns, which provide a food source for fishes and prawns.
- They are repositories of immense biological diversity.
- The mangrove conservation programme was launched in 1987 and so far 35 mangrove areas have been identified for intensive convervation and management in our county.
- Sunderbans has been included in the world list of Biosphere Reserves by UNESCO.
- A mangrove genetic resource center is established in the Pichavaram mangrove area, Chidambaram, India where the endangered mangrove species are being conserved.

Coral Reefs

- Coral is plant-animal super organism, an algae called zooxanthellae, grow inside the tissues of the animal polyp, thus exhibits mutualism between polyps & algae
- Located generally between 30 degrees North and 30 degrees South latitudes.
- Found scattered in coastal zones above contineantal shelves throughout the tropical and subtropical western Atlantic and Indo-pacific oceans.
- The polyp is able to feed itself using stinging cells found on its tentacles, but is able to feed itself partially. The ramainder comes from the zooxanthellae and the carbohydrates are also used by the polyp to make calcium carbonate via calcification.This material forms the skeleton of the coral and eventually the framework known as the coral reef.
- Polyps secrete hard limestone deposits (calcium carbonate that ramain when polyps die.
- Coral reefs are sometimes referred to as 'tropical rainforests of the deep'.
- Bleaching: Under enviornmental stress much of the algae are lost and corals appear white in colour. If the symbiotic green algae leave the coral animal and the mutumlism is not restored then the coral slowly dies of starvation.

Importance of Coral reefs

- Apart from tropical rain forests, they are the other most productive natural ecosystems in the world.



- They protect coastline from storms & high waves by breaking the force of the waves, thereby allowing mangroves and sea grass to flourish.
- They serve as nurseries for many fish species and provide resources for fisheries.
- Coral skeletons are being used as bone substitutes in reconstructive bone surgery. The pores and channel in certain

corals resemble those found in human bone. Bone tissue and blood vessels gradually spread into the coral graft. Eventually, bone replaces most of the coral implant.

Terrestrial Ecosystem

Biomes can be defined as major ecological communities of flora and fauna, which generally extend over a large part of the earth surface and usually characterized by a distinct type of vegetation.

The main terrestrial biomes are:

- Tundra
- Coniferous forests/Temperate evergreen forests
- Temperate Broadlead deciduous forests
- Mediterranean Shrublands
- Grasslands
- Deserts
- Tropical deciduous forests
- Tropical scurubs/Thornwoods
- Tropical rain forests
- F.E elements and V.E shelford (1939) introduced the biome concept.
- Ecotone: boundary between two biomes.
- Bailey (1976) developed the concept of ecoregion.
- Ecoregions: Ecosystems based on a continous geographical or landscape area across which the inderactions of climate, soil and topography are sufficiently uniform to permit the development of similar types of vegetation

Community

A group of population of different species living togetherin a given area with mutual tolerance and beneficiary interactions is defined as **community**. The species may be plant,animal or micro organism.

Characteristics:

- Biodiversity
  1. Species richness
  2. Relative abundance
- Dominant vegetation
- Stability/disturbance
- Succession

Population

A population is a summation of all the organisms of the same group or species, which live in aparticular geographical area, and have the capability of interbreeding.

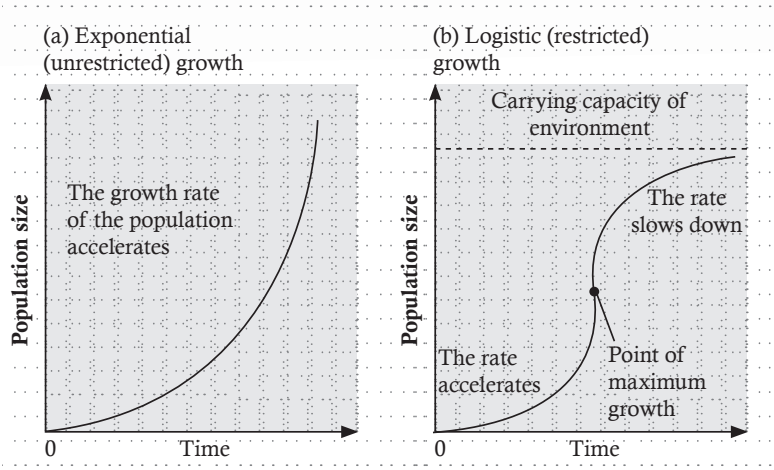
Population Dynamic is the change in the number of individuals in a population or the vital rates of a population over time.It is the key to

- Examine the response of species to ecosystem manipulation,
- Analyzetheendangered species
- Understand ecosystem dynamics and ecology

Theories of Population Dynamics

- **Exponential population growth** is when the birth rate is constant over a period of time and isn't limited by food or disease. A species growing exponentially would also affect other species directly due to competition for food and other resources. Exponential growth can be affected by modern medicine, quality and quantity of food and the overall standard of living for a species.
- **Logistic growth** describes a sustainable growth of populations which slows down

after a period of significant development as the availability of living space and resources, along with other factors, limits its growing ability. The logistics growth model is a more reliable measure of population growth than the exponential model because it accounts for the real-world factors that inhibit population growth.



Organism

An organism, is any form of contiguous living system such as an animal, plant orbacterium with cell as its basic units. Allorganism have developed with some degree of response to to stimuli,reproduction, growth and development and homeostasis. As the basic unit of every organism is cell it can be categorized into both uni cellular and multi cellular depending upon the no. of cells present in the organism. Mostly the unicellular organisms are microscopic by nature.

Biodiversity means diversity or heterogeneity at all levels of biological organization, i.e., from macromolecules of the cells to the Biomass. The term Biodiversity was popularized by the sociologist- **Edward Wilson.**

The important levels of biodiversity are

1. Genetic diversity, 2. Species diversity, 3. Ecological diversity

1. Genetic diversity

It is the diversity at genetic level, or at subspecies level, i.e. below species level, in a single species.

The genetic diversity helps the population to adapt. If a population has more diversity it can adapt better to the changed environmental conditions. The low diversity leads to uniformity. The genetic variability is therefore, considered to be the raw material for speciation.

2. Species diversity

The measurement of species diversity is its richness, i.e. the number of species per unit area. The greater is the species richness the more will be the species diversity.

In nature, the number and kind of species, as well as the number of individual per species, vary, and this leads to greater diversity.

3. Ecological diversity

It is the diversity at community level. It can be of 3-types

1. **Alpha (α) diversity :** It is the diversity of organisms within the same community or habitat.
2. **Beta (β) diversity :** It is the diversity between communities or different habitats. Higher the heterogenecity in the altitude, Humidity and Temperature of a region, the greater will be the dissimilarity between communities, and higher will be the β diversity.
3. **Gamma (γ) diversity :** It is the diversity of organisms over the entire geographical area, covering several ecosystems or habitats and various trophic levels and food webs. Such diversity is most stable and productive.

Causes of Loss of Biodiversity

The accelerated rate of species-extinction is largely due to human activities. There are 4-major causes, called

'**The Evil Quartet',** for the loss of biodiversity –

1. Habitat loss and fragmentation
2. Overexploitation
3. Invasion of Alien or exotic species
4. Co-extinctions

The **Conservation of biodiversity** can be *in situ* (on site) or *ex situ* (off site)–

In such conservation the endangered species are protected in their natural habitat with entire ecosystem. The conservationists, on global basis, have identified certain Biodiversity Hot Spots

The 3-biodiversity hot spots of India, that cover rich-biodiversity regions, are

1. Western Ghat
2. Himalaya
3. Indo-Burma

The *in situ* conservation in India, is done through **15– Biosphere reserves, 90-National Parks,** more than **450 sanctuaries** and several **Sacred Groves** or the tracts of forests.

1. Biosphere reserves

They represent natural biomes which contain unique biological communities. They include land as well as coastal environment.

(i) Core (natural) zone – It is inner most zone

(ii) Buffer zone - In this zone limited human activity is allowed for research and education purposes.

(iii) Transition (manipulation) zone – It is the outermost zone of biosphere reserve in which large number of human activities are permitted,

2. National Parks

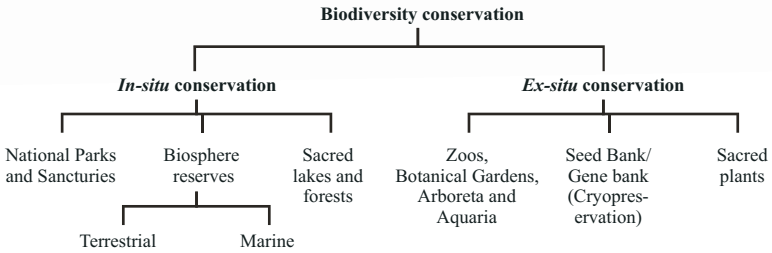
They are reserved for the betterment of wild life, both **fauna and flora.** In national parks private ownership is not allowed. The grazing, cultivation, forestry etc. is also not permitted. The first national park of the world, Yellow stone, in U.S.A., was founded in 1872.

3. Sanctuaries

In sanctuaries the protection is given to **fauna** only**.** The activity like harvesting of timber, collection of forest products and private ownership rights are permitted so long as they

do not interfere with the well being of the animals. The important wild life sanctuaries are Chilka wild life sanctuary (Odisha), Bharatpur Bird Sanctuary (Rajasthan),

4. The sacred groves are found in Khasi and Jaintia hills (Meghalaya), Aravalli hills (Rajasthan), Western ghats (Karnataka and Maharashtra) and Sarguja, Chanda and Bastar areas of Madhya Pradesh.



2. ***Ex situ*** conservation

In such type of conservation the threatened animals and plants are taken out of their natural habitat and are protected in special parks or areas like, Zoological parks, Wild life safari parks and Botanical gardens etc. The *ex situ* conservation also includes Cryopreservation.

BIO-GEOGRAPHY

Bio-geographic classification of India is the division of India according to bio-geographic characteristics. Biogeography is the study of the distribution of species (biology), organisms, and ecosystems in geographic space and through geological time. There are ten bio-geographic zones in India.

1. Trans-Himalayan Region

The range lies north of the Great Himalayan range is called the Trans-Himalayas. Its sparse vegetation has the richest wild sheep and goat community in the world. The snow leopard and the migratory black-necked crane are found here.

2. Himalayas

The youngest and loftiest mountain chains in the world are found here. The high altitude, steep gradient and rich temperate flora of the Himalaya contain extensive growth of grass and evergreen tall trees. Oak, chestnut, conifer, ash, pine, deodar are abundant in Himalayas. There is no vegetation above the snowline. The chief species of fauna include wild sheep, mountain goats, ibex, shrew, and tapir. Panda and snow leopard are also found here.

3. Semi-Arid Areas

In transitional zone between the desert and the denser forests of the Western Ghats lies the semi- arid area. This region is characterized by discontinuous vegetation cover with open areas of bare soil and soil-water deficit throughout the year. The main vegetation of the region includes thorny scrubs, grasses and some bamboos along with few species of xerophytic herbs and some ephemeral herbs are found in this semi-arid tract. Birds, jackals, leopards, eagles, snakes, fox, buffaloes are found in this region.

4. Western Ghats

Extend from the southern tip of the peninsula (8°N) northwards about 1600 km to the mouth of the river Tapti (21°N) lies the Western Ghats between the west coast and peninsular India. The Western Ghats are amongst the 25 biodiversity hot-spots constitute one of the unique biological regions of the world. The climate varies with topography. Mountain side facing Arabian Sea gets heavy rainfall and evergreen forest is found there in contrast with the other side of the mountain that lies in rain shadow.

5. North-West Desert Regions

This landmass comprised Rajasthan, Kutch, Delhi and parts of Gujarat. It experiences less rainfall and very hot and dry summer and cold winter. Plants are mostly xerophytic in nature. Moderate rainfall regions grow Babul, Kikar and wild palm. Indian Bustard, a highly endangered bird is found here. Camels, wild asses, foxes, and snakes are found in hot and arid deserts.

6. Deccan Plateau

To the east and west of Ghats lies the Deccan Plateau, having semi-arid vegetation laying in rain shadow region of Western Ghats. This is the largest unit of the Peninsular Plateau of India. The highlands of the plateau are covered with different types of forests, which provide a large variety of forest products.

7. Gangetic Plain

Gangetic plain extending up to Himalayan foothills forms the largest plain of India. Main rivers of this plain are the Ganga and the Brahmaputra, covering about 72.4mha area. Thick alluvial sediments are found with varying thickness across plain with highest density in India. The trees belonging to these forests are teak, sal, shisham, mahua, khair etc. The region has agro-based economy. It extends from arid and semi-arid landscapes of Rajasthan Plains in west to Assam valley in the east.

8. North-East India

Being the richest flora region in the country it has numerous species of orchids, bamboos, ferns and other plants. Many wild relatives of cultivated plants such as banana, mango, citrus and pepper can be found.

9. Islands

There are two groups of islands in India, i.e., the Arabian Sea islands and Bay Islands. The islands of Arabian Sea (Laccadive, Minicoy, etc.) belong to the old landmass remnants (590 Km nearest main land mass) as compared to the Bay Islands which lay only about 220 km. Some of the islands are fringed with coral reefs. Many of them are covered with thick forests and some are highly dissected.

10. Coasts

The coastline of India extends over 5,500 km. Most of the area here has fertile soil with different crops growing. Narrow coast is found in the west than east I.e. Gulf of Cambay and the Gulf of Kutch and extreme south- however, it is somewhat wider along the south Sahyadri. The western coast is characterized by the backwaters. The east coast plains have broader coast due to depositional activities of the east-flowing rivers owing to the change in their base levels. Extensive deltas of the Mahanadi, Godavari, Krishna and Kaveri are the characteristic features of this coast. Mangrove vegetation is characteristic of estuarine tracts along the coast for instance, at Ratnagiri in Maharashtra.

ENVIRONMENTAL ISSUES

Deforestation

It is the conversion of forest to another land use or the long-term reduction of the tree canopy cover. This includes conversion of natural forest to tree plantations, agriculture, pasture, water reservoirs and urban areas but excludes timber production areas managed to ensure the forest regenerates after logging (WWF, 2015).

Causes	Impact
Subsistence farming (48%) Commercial agriculture (32%) Logging (14%) Fuel wood removals (5%)	• Physical and ecological processes, (e.g. disruption of hydrological regimes and loss of watershed protection). • Soil and water resources, (e.g. soil erosion, loss of nutrients and increase in sediment loads in river systems)on local and global climate, e.g. albedo changes, changes in surface energy budget, and alteration of biogeochemical cycles (such as the global carbon cycle) leading to an increase in atmospheric CO2 and other trace gases, affecting the climate and causing global temperature change, Diversity and abundance of terrestr ial species through destruction and fragmentation of habitats and the "edge effects", decreasing ecological complexity.

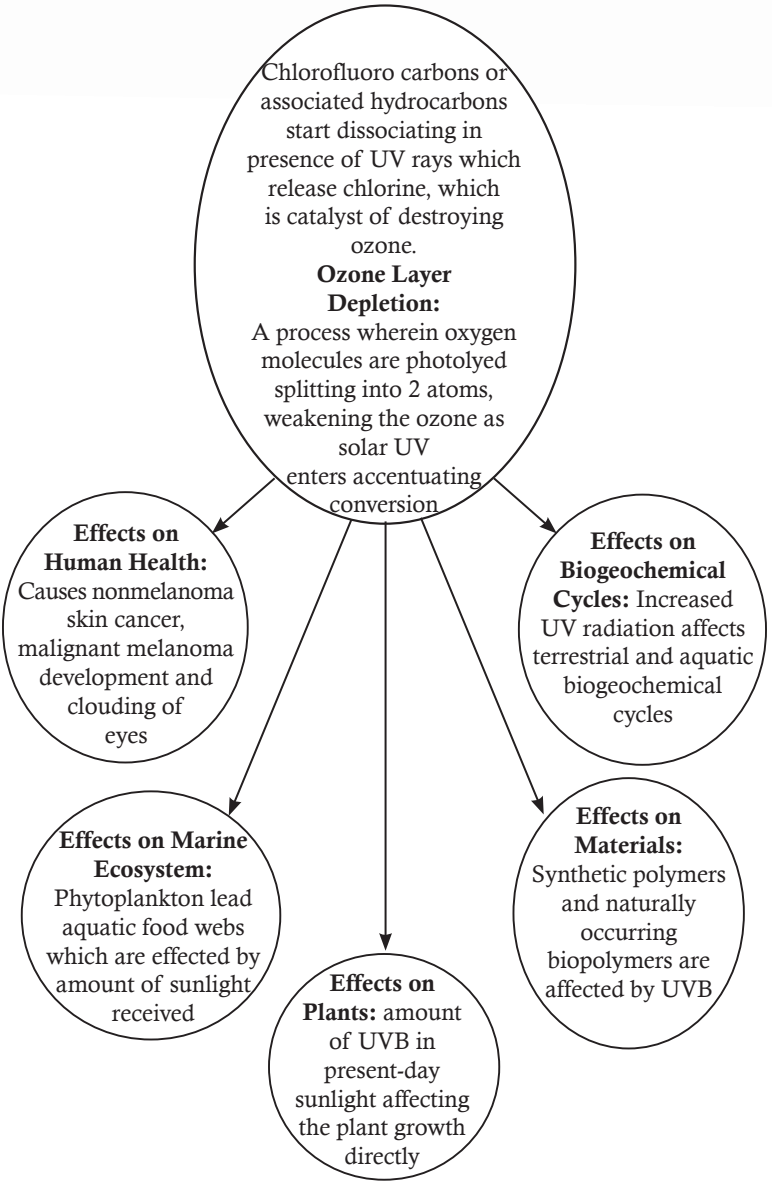
Desertification

The U.N. Convention to Combat Desertification (UNCCD) defines it as "land degradation in arid, semiarid and dry sub-humid areas resulting from various factors, including climatic variations and human activities." This process is the result of a long-term failure to balance human demand for ecosystem services and the amount the ecosystem can supply. The stress mounts on dry land ecosystems for providing services related to basic human existence. The situation worsens when combined with human factors (such as population pressure and land use patterns) and climatic factors (such as droughts).

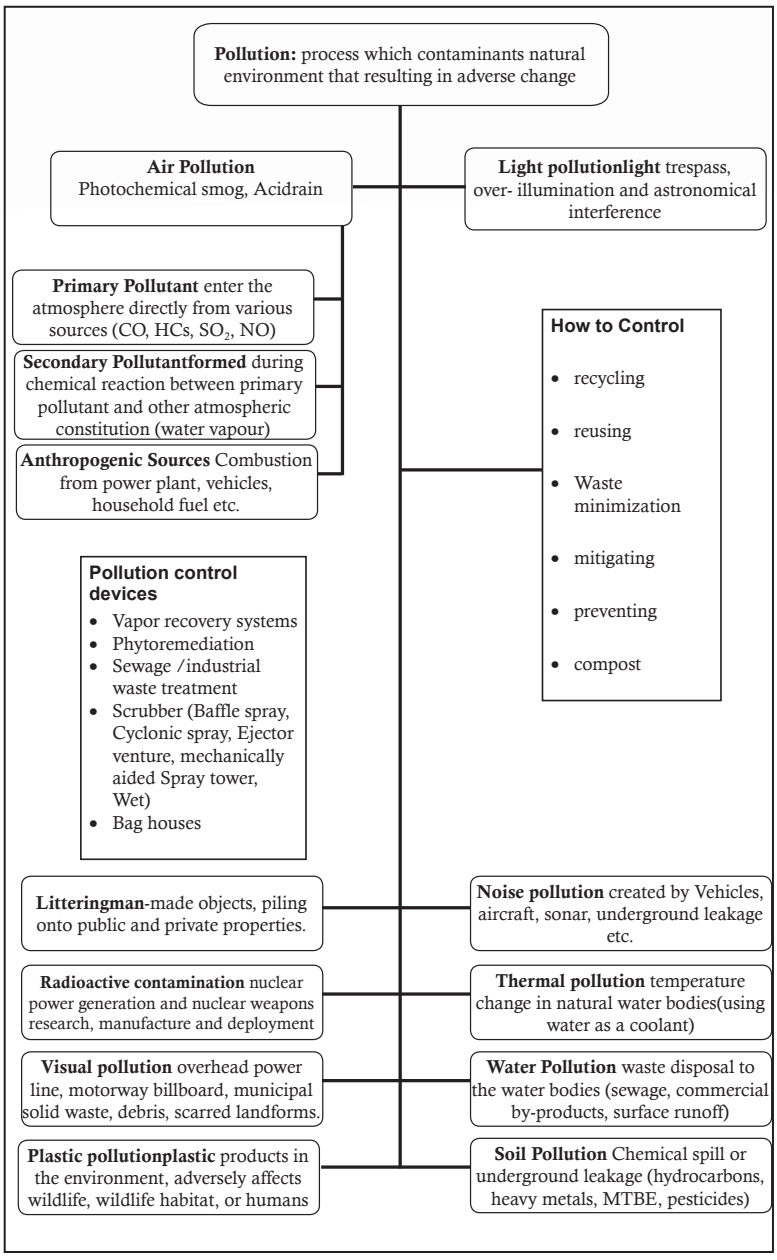
Causes	Effects	Measures
Overgrazing	Soil becomes less usable	Afforestation and planting of soil binding grasses can check soil erosion, floods and water logging
Farming of Average Land	Vegetation is Lacked or Damaged	Crop rotation and mixed cropping improve the fertility.
Destruction of Plants in Dry Regions	Causes Famine	Artificial bunds or covering the area with vegetation.

Incorrect Irrigation in Arid Regions Causes a Build-up of Salt in the Soil	Food Loss	Salinity of the soil can be checked by improved drainage

Ozone Layer Depletion: Causes and Effects



Pollution Types and measures of their Control



Green House Effect and Global Warming

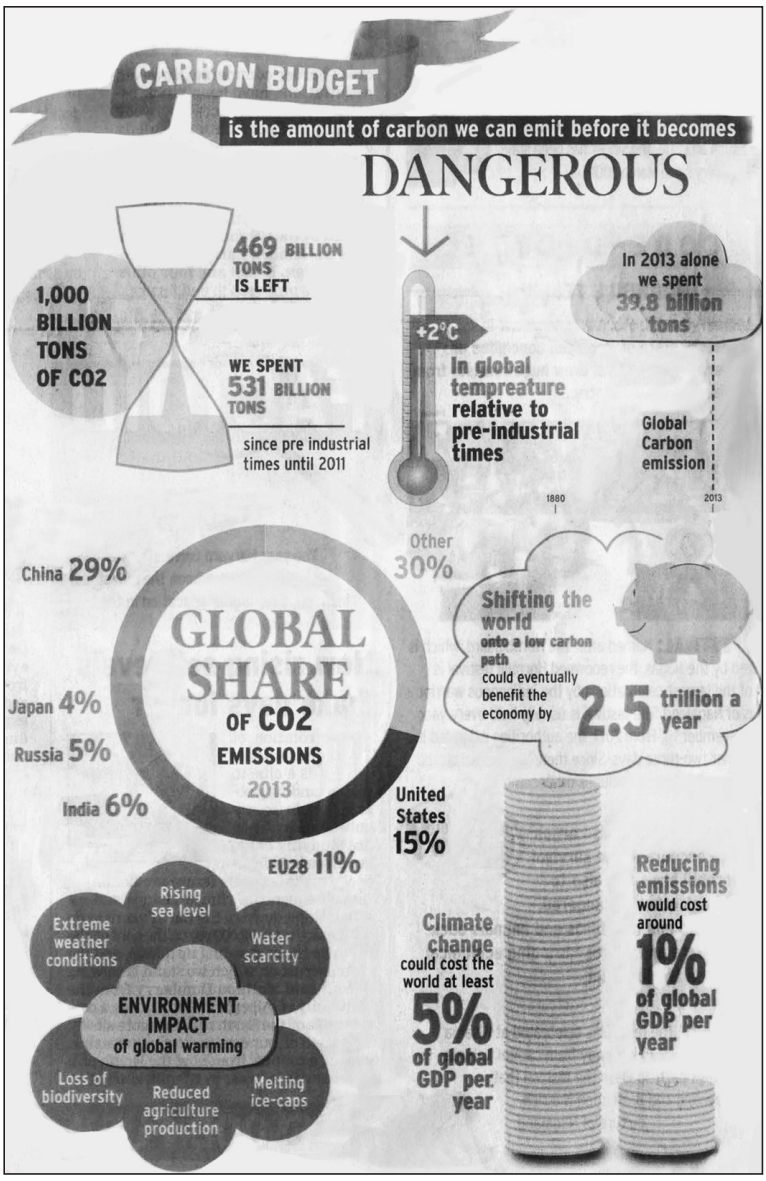
Greenhouse effect is the phenomenon of heating of Atmosphere as a result of short wave radiations transmitted inward through earth atmosphere owing to its absorption by atmospheric carbon dioxide, water vapor, methane, and other gases. It's a natural process that keeps the temperature suitable for sustenance of life. But the matter of concern is **enhanced greenhouse effect** which refers to intensification of the effect due to increase in the toxic gaseous envelop of these gases and ultimately lead to the rise of temperature. The process of rise in temperature is known as **Global Warming.**

Greenhouse gas emission is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. The primary green house gases in Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone.

WHO IS DOING WHAT FOR CLIMATE?	
GHG emission	**Country**
24%	**CHINA :** Envisages a peak in emissions by around 2030, and reducing carbon intensity (CO_2 emitted per unit of GDP) by 60-65 per cent by 2030 compared with 2005 levels. The world's most populous nation will boost the share of non-fossil fuel in primary energy consumption from 11.2 per cent in 2014 to 20 per cent, and boost the volume of CO2-absorbing forest by about 4.5 billion cubic metres.
6.4%	**INDIA :** Plans to reduce carbon intensity by 35 per cent by 2030 from 2005 levels, and generate 40 per cent of its electricity from renewable sources by the same date.
1.6%	**IRAN :** Iran has made an unconditional pledge to reduce its greenhouse gas emissions in 2030 by four per cent compared with a "business as usual" secnario. In addition. Tehran said it would reduce emissions by another eight per cent if it receves financial and technology support, and if what it describes as :unjust sanctions' where lifted.
4.9%	**RUSSIA :** Has mooted cutting emissions by 25-30 per cent by 2030 from 1990 levels, Conditional on the pledges of other "major emitters".
2.9%	**JAPAN :** Has pledged a 26 per cent reduction in emissions from 2013 levels by 2030, with nuclear energy – offline since the 2011 Fukushima disaster – providing 20- 22 per cent of electricity by then. Renewable electricity production, including hydro power, would be expanded to a 22-24 per cent share, from 11 per cent in 2014.
1.6%	**INDONESIA :** A 29 per cent cut in emissions by 2030 compared with what the level would have been with our any action. With financial and other help, this could be raised to 41 per cent.
10.8%	**EUROPEAN UNION :** The 28-member bloc in tends to cut emissions by at least 40 per cent by 2030 over 1990 levels, and has set 27 per cent targets for renewable energy supply and efficiency gains.
2.1%	**BRAZIL :** Will cut emissions by 37 per cent by 2025 from 2005 and 43 per cent by 2030.
15.5%	**UNITED STATES :** Has pledged a 26-28 per cent reduction in emissions from 2005 levels by 2025. Power plants are to cut carbon dioxide pollution by 32 per cent by 2030.

1.5%	**CANADA :** Will seek to cut emissions by 30 per cent from the 2005 levels by 2030. Canada has done its bit by cutting carbon emission and putting a curb on pollution in major cities in the country.

Source: TOI



Source: TOI

ENDANGERED SPECIES IN INDIA	
Birds	White-bellied heron Great Indian bustard (Ardeotis nigriceps) Forest owlet (Athene blewitti) Baer's pochard (Aythya baeri) Spoon-billed sandpiper (Eurynorhynchus pygmeus) Siberian crane (Grus leucogeranus) White-rumped vulture (Gyps bengalensis) Indian vulture (Gyps indicus) Slender-billed vulture (Gyps tenuirostris) Bengal florican (Houbaropsis bengalensis) Himalayan quail (Ophrysia superciliosa) Jerdon's courser (Rhinoptilus bitorquatus) Pink-headed duck (Rhodonessa caryophyllacea) Red-headed vulture (Sarcogyps calvus) Sociable lapwing (Vanellus gregarius) Bugun liocichla (Liocichla bugunorum)
Fish	Knifetooth sawfish (Anoxypristis cuspidata) Pondicherry shark (Carcharhinus hemiodon) Ganges shark (Glyphis gangeticus) Deccan labeo (Labeo potail) Largetooth sawfish (Pristis microdon) Longcomb sawfish (Pristis zijsron) Humpback mahseer
Reptiles and Amphibians	Northern river terrapin (Batagur baska) Red-crowned roofed turtle (Batagur kachuga) Hawksbill sea turtle (Eretmochelys imbricata) Gharial (Gavialis gangeticus) Ghats wart frog (Fejervarya murthii) Gundia Indian frog (Indirana gundia) Toad-skinned frog (Indirana phrynoderma) Charles Darwin's frog (Ingerana charlesdarwini) Rao's torrent frog (Micrixalus kottigeharensis) Amboli bush frog (Pseudophilautus amboli) White-spotted bush frog (Raorchestes chalazodes) Griet bush frog (Raorchestes griet) Munnar bush frog (Raorchestes munnarensis) Ponmudi bush frog (Raorchestes ponmudi) Sacred Grove bush frog (Raorchestes sanctisilvaticus) Shillong bubble-nest frog (Raorchestes shillongensis) Resplendent shrubfrog (Raorchestes resplendens) Anaimalai flying frog (Rhacophorus pseudomalabaricus) Patinghe Indian gecko (Geckoella jeyporensis)
Mammals	Asiatic cheetah (Acinonyx jubatus venaticus) Namdapha flying squirrel (Biswamoyopterus biswasi) Himalayan wolf (Canis himalayensis) Andaman Shrew (Crocidura andamanensis) Jenkins' shrew (Crocidura jenkinsi) Nicobar shrew (Crocidura nicobarica) Northern Sumatran rhinoceros (Dicerorhinus sumatrensis lasiotis)

	Kondana soft-furred rat (Millardia kondana) Pygmy hog (Porcula salvania) Indian Javan rhinoceros (Rhinoceros sondaicus inermis) Malabar large-spotted civet (Viverra civettina) Elvira rat (Cremnomys elvira) Chinese pangolin (Manis pentadactyla) Kashmir stag (Cervus canadensis hanglu)
Coral	Fire corals (Millepora boschmai) Spiders Rameshwaram Ornamental or Parachute Spider (Poecilotheria hanumavilasumica) Gooty Tarantula, Metallic Tarantula or (Poecilotheria metallica)

INDIA INITIATIVES TOWARDS ENVIRONMENTAL ISSUES

- **National Solar Mission:** the NAPCC aims to promote the development and use of solar energy for power generation and ohter usees with the ultimate objective of making solar competitive with fossil-based energy options.
- **National Water Mission:** with water scarcity projected to worsen as a result of climate change, the plan set a goal of a 20% improvement in water use efficiency through pricing and other measures.
- **National Mission on Sustainable Habitat:** To promote energy efficiency as a core component of urban planning.
- **National Mission for Enhanced Energy Efficiency:** Current initiatives are expected to yield saving of 10,000 MW by 2012.
- **National Mission for Sustaining the Himalayan Ecosystem:** The plan aims to conserve biodiversity, forest cover, and other ecological values in the Himalauan region, where glaciers that are a major source of india's water supply are projected to recede as a result of global warming.
- **National Mission for a "green India":** Goals include the afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.
- **National Mission for Sustainable Agriculture:** the plan aims to support climate adapation in agriculture through the develoment of climate-resilient crops, expansion of weather insurance mechanisms,and agricultural practices.
- **National Mission on Srategic knowledge for Climate Change:** To gain better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modeling, and increased international collaboration.

INTERNATIONAL CONVENTIONS FOR CLIMATE CHANGE

Convention	Place	Crucial documents
United nation Conference on environment and Development or Earth Summit (1992)	Rio de Janeiro, Brazil	• Draft Earth Charter • Convention on climate change and Biological Diversity • Convention on Forest • Agenda 21
The United Nations Framework Convention on Climate Change (1994)	Kyoto, Japan	• Gather and share information on greenhouse gas emissions, national policies and best practices • Launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries • Cooperate in preparing for adaptation to the impacts of climate change
Convention on Biological Diversity (1993)		• The conservation of biological diversity • The sustainable use of the components of biological diversity • The fair and equitable sharing of the benefits arising out of the utilization of genetic resources
Ramsar Convention on Wetland (1971)	Ramsar, Iran	• Halt the worldwide loss of wetlands and • To conserve, use and management, those that remain. • This requires international cooperation, policy making, capacity building and technology transfer.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1963)	Washington, U.S.A.	• Help in conservation of species
Convention on the Conservation of Migratory Species of Wild Animals (1976)	Bad Godesberg, Germany	• It is an intergovernmental treaty • should promote, cooperate in and support research relating to migratory species • hall endeavour to provide immediate protection for migratory species • conservation and management of migratory species included in Appendix II
International Tropical Timber Organization (1983)	Geneva	• Provide an effective framework for cooperation between tropical timber producers and consumers • To encourage the development of national policies aimed at sustainable utilization • Conservation of tropical forests and their genetic resources

United Nations Forum on Forests (2000)		• Implementation of agreements and foster a common understanding on sustainable forest management; • To provide policy development and dialogue among Governments and international organizations, • To enhance cooperation • To foster international cooperation and • To monitor, assess and report on progress of the above functions and objectives • To strengthen political commitment to the management, conservation and sustainable development.
Global tiger forum (1994)	New Delhi, India	• Set up to embark on a worldwide campaign to save the wild tiger
Stockholm Convention on Persistent Organic Pollutants (2001)	Stockholm, Sweden	• It develops a risk management evaluation • Determines whether the substance fulfills POP screening. • Manage and dispose of POPs wastes in an environmentally sound manner
Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal (1989)	Basel, Switzerland	• To reduce hazardous waste generation and promote environmental sound management system for their disposal. • Restrict trans boundary movement of such wastes and • Provide regulatory system applying to cases where such movement is allowable.
Rotterdam Convention (2004)	Rotterdam, Netherlands	• convention promotes open exchange of information • calls on exporters of hazardous chemicals to use proper labeling • inform purchasers of any known restrictions or bans
United Nations Convention to Combat Desertification (1994)		• promotes a global response to desertification, land degradation and drought
International Whaling Commission (1946)	Washington, D.C., United States,	• to keep under review and revise as necessary the measures laid down in the Schedule to the Convention which govern the conduct of whaling throughout the world
Montreal Protocol on Substances that Deplete the Ozone Layer (1987)	Helsinki, Finland	• Play role in controlling the ozone depletion

NATIONAL PARKS IN INDIA

Name	State	Notability
Bandipur National Park (1974)	Karnataka	Chital, gray langurs, Indian giant squirrel, Gaur, leopard, Sambar deer, indian elephants, honey buzzard, red-headed vulture and other animals.
Bannerghatta National Park (Bannerghatta Biological Park) (1974)	Karnataka	White Tiger, Royal Bengal Tiger, Bear, other animals
Betla National Park (1986)	Jharkhand	Tiger, Sloth Bear, Peacock, Elephant, Sambar deer, mouse deer and other animals.
Bhitarkanika National Park (1988)	Odisha	Mangroves, Saltwater crocodile, white crocodile, Indian python, black ibis, wild pigs, rhesus monkeys, chital and other animals
Buxa Tiger Reserve (1992)	West Bengal	Tiger
Dachigam National Park (1981)	J&K	Only area where Kashmir stag is found
Dudhwa National Park (1977)	U.P	Swamp deer, sambar deer, barking deer, spotted deer, hog deer, tiger, Indian rhinoceros,
Gir Forest National Park (1965)	Gujarat	Asiatic lion
Great Himalayan National Park (1984)	Himachal Pradesh,	UNESCO World Heritage Site
Gulf of Mannar Marine National Park (1980)	Tamil Nadu	Green turtles and Olive Ridley turtles and whales.
Indravati National Park (1981)	Chhattisgarh	Wild Asian Buffalo, Tiger Reserve, Hill Mynas
Jaldapara National Park (2012)	West Bengal	Indian one horned rhinoceros
Jim Corbett National Park (1936)	Uttarakhand	Tiger
Kanha National Park (1955)	M. P.	Swamp Deer, Tigers
Kaziranga National Park (1905)	Assam	Indian rhinoceros, UNESCO World Heritage Site
Keibul Lamjao National Park (1977)	Manipur	only floating park in the world
Keoladeo National Park (1981)	Rajasthan	UNESCO World Heritage Site
Manas National Park (1990)	Assam	UNESCO World Heritage Site
Mandla Plant Fossils National Park (1983)	M. P	Plant Fossils National Park
Marine National Park, Gulf of Kutch (1980)	Gujarat	70 species of sponges, Coral 52 species along with puffer fishes, sea horse and sting ray

Namdapha National Park (1974)	Arunachal Pradesh	Snow Leopards, Clouded Leopards, Common Leopards and Tigers
Nanda Devi National Park (1982)	Uttarakhand	UNESCO World Heritage Site
Neora Valley National Park (1986)	West Bengal	clouded leopard, red panda and musk deer
Nokrek National Park (1986)	Meghalaya	UNESCO World Biosphere Reserve
Periyar National Park (1982)	Kerala	Tigers
Ranthambore National Park (1981)	Rajasthan	Tigers, Leopards, Striped Hyenas, Sambar deer and Chital.
Sariska Tiger Reserve (1955)	Rajasthan	Tiger
Simlipal National Park (1980)	Odisha	Tiger, Leopard, Asian elephant, Sambar, Barking deer, Gaur, Jungle cat, Wild boar, and other animals.
Sultanpur National Park (1989)	Haryana	Siberian crane, greater flamingo, ruff, black-winged stilt, common teal, northern pintail, and yellow wagtail.
Sundarbans National Park (1984)	West Bengal	UNESCO World Heritage Site
Valley of Flowers National Park (1982)	Uttarakhand	Flying squirrel, Himalayan black bear, red fox, Himalayan weaseland Himalayan yellow-throated marten, and Himalayan goral

WILD LIFE SANCTUARIES

India has 515 animal sanctuaries referred to as wildlife sanctuaries category IV protected areas. Among these, the 48 tiger reserves are governed by Project Tiger, and are of special significance in the conservation of the tiger.

WILD LIFE SANCTUARIES IN INDIA

Name of the Sanctuary	Location	Major Species
Gir Wild Life Sanctuary	Sasan Gir, Junagadh, Amreli	Lion, Leopard, Chausinga, Chital, Hyena, Sambar, Chinkara, Herpetofauna, Crocodiles and birds
Wild Ass Sanctuary	Little Rann of Kachchh	Wild Ass, Chinkara, Blue bull, Houbara bustard, Wolf, Waterfowls, Herpetofauna
Hingolgadh Sanctuary	Hingolgadh, Rajkot	Chinkara, Blue bull, Wolf, Hyena, Fox, Birds, Herpetofauna
Marine Sanctuary	Gulf of Kachchh, Jamnagar	Sponges, Corals, Jellyfish, Sea horse, Octopus,Oyster, Pearloyster, Starfish, Lobster, Dolphin, Dugong, waterfowls
Simlipal Sactuary	Odisha	Elephant, Tiger, Leopard, Gaur, Cheetal
Kutch Desert Sanctuary	Great Rann of Kachchh	Chinkara, Hyena, Fox, Flamingo, Pelicans & other waterfowls, Herpetofauna

Rampara Sanctuary	Rampara, Rajkot	Blue bull, Chinkara, Wolf, Fox, Jackal, Birds, Herpetofauna
Ghana Bird Sanctuary	Rajasthan	Water Bird, Black-buck, Cheetal, Sambar
Panchmarhi	Madhya Pradesh	Tiger, Panther, Sambhar, Nilgai, Baskeng, Deer
Dandeli Sanctuary	Karnataka	Tiger, Panther, Elephant, Cheetal, Sanbhar, Wild Boar
Kutch Bustard Sanctuary	Near Naliya, Kachchh	Great Indian Bustard, Lesser Florican, Houbara bustard, Chinkara, Blue bull, Herpetofauna

BIOSPHERE RESERVES IN INDIA AREA-WISE

Name	State	Key Fauna
Nilgiri Biosphere Reserve	Tamil Nadu, Kerala and Karnataka	Nilgiri tahr, lion-tailed macaque
Nanda Devi National Park & Biosphere Reserve	Uttarakhand	
Gulf of Mannar	Tamil Nadu	Dugong or sea cow
Nokrek	Meghalaya	Red panda
Sundarbans	West Bengal	Royal Bengal tiger
Manas	Assam	Golden langur, red panda
Simlipal	Odisha	Gaur, royal Bengal tiger, elephant
Dihang-Dibang	Arunachal Pradesh	
Pachmarhi Biosphere Reserve	Madhya Pradesh	Giant squirrel, flying squirrel
Achanakmar-Amarkantak Biosphere Reserve	Madhya Pradesh, Chhattisgarh	Four horned antelope (Tetracerus quadricornis), Indian wild dog (Cuon alpinus), Saras crane (Grus antigone), Asian white-backed vulture (Gyps bengalensis), Sacred grove bush frog (Philautus sanctisilvaticus)
Great Rann of Kutch	Gujarat	Indian wild ass
Cold Desert	Himachal Pradesh	Snow leopard
Khangchendzonga	Sikkim	Snow leopard, red panda
AgasthyamalI Biosphere Reserve	Kerala, Tamil Nadu	Nilgiri tahr, elephants
Great Nicobar Biosphere Reserve	Andaman and Nicobar Islands	Saltwater crocodile
Dibru-Saikhowa	Assam	Golden langur
Seshachalam Hills	Andhra Pradesh	
Panna	Madhya Pradesh	Tiger, chital, chinkara, sambhar and sloth bear

ANIMAL WELFARE

People for the Ethical Treatment of Animals (PETA)

It is a non-profitable American animal rights organization based in Norfolk, Virginia. Led by Ingrid Newkirk, its international president, founded in 1980 with a slogan of "Animals are not ours to eat, wear, experiment on, use for entertainment, or abuse in any other way." It focuses its attention on the four areas in which the largest numbers of animals suffer the most intensely for the longest periods of time: on factory farms, in the clothing trade, in laboratories, and in the entertainment industry.

World Wide Fund for Nature

The organisation was conceived in Morges, Switzerland (29, April, 1961). It is an international non-governmental organization in nature. Works in the field related to biodiversity conservation, and the reduction of humanity's footprint on the environment. It is the world's largest conservation organization with the slogan of "For a Living Planet." The method of its working involves Lobbying Research and Consultancy. Basically it's a charitable trust. WWF's giant panda logo originated from a panda named Chi Chi. It has been designed by Sir Peter Scott from preliminary sketches made by Gerald Watterson.

The main missions of WWF are as follows:

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- Promoting the reduction of pollution and wasteful consumption.

At present WWF's current strategy of achieving its mission which is related to restoring populations of 36 species (species or species groups that are important for their ecosystem or to people, including elephants, tunas, whales, dolphins and porpoises), and ecological footprint in 6 areas (carbon emissions, cropland, grazing land, fishing, forestry and water).

Animal Welfare Board of India

Functions

- To keep the law in force in India for the Prevention of Cruelty to Animals under constant study and to advise the government on the amendments to be undertaken in any such law from time to time.
- To advise the Central Government on the making of rules under the Act with a view to preventing unnecessary pain or suffering to animals and transported.
- To advise in the design of vehicles so as to lessen the burden on draught animals.
- To take all such steps as the Board may think fit for amelioration of animals by encouraging, or providing for the construction of sheds, water troughs and the like and by providing for veterinary assistance to animals.
- To advise in the design of slaughter houses or its maintenance.

INDIA INITIATIVES TOWARDS ANIMAL PROTECTION

Project Tiger an government of India initiative for conserving its national animal, the tiger. The project was launched in 1973. Since then the no of tiger reserve has been increased from 9 to 47 which accounts for 2.08% the total geographical area of our country. The area of tiger projects have been developed on core/ buffer strategy. The core areas are legally termed as National Parks and the buffering areas are a mixture of forest and non-forest land managed as a multiple used area. The project aims at fostering an exclusive tiger agenda in the core areas of tiger reserves, with an inclusive people oriented agenda in the buffer

Project Rhino was joint venture of the Assam Forest Department and Wildlife Trust of India - InternationalFund for Animal Welfare (WTI-IFAW) and initiated in February 2006 with the trans location of a hand-raised rhino calf to Manas Wildlife Sanctuary. The projects aims at repopulatimg the one horn rhino by displacing them to Manas wild life sanctuary from Kaziranga National Park. The whole project is supported by Bodoland Territorial Council and the Assam Forest Department.

Project Crocodile Conservation was launched in 1975 in different States for protecting the endangered crocodile species like Gharial, Gavialis gangeticus; Mugger crocodile, Crocodylus palustris and Saltwater crocodile, Crocodylus were on the verge of extinction by the seventies. The funds and technical support for the project came from UNDP/ FAO through the Government of India.

Project Elephant (PE) is a central government initiative to provide financial and technical support to major elephant bearing states of India. It was launched in February 1992. It aims at protecting the elephants, their habitat and corridor. It also looks after the human elephant issues. It is implemented in 13 States / UTs, viz. Andhra pradesh, Arunachal Pradesh, Assam, Jharkhand, Karnataka, Kerala, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttranchal, Uttar Pradesh and West Bengal.

SAVE i.e. Saving Asia's Vultures from Extinction is a consortium of regional and international organization to co-ordinate conservation, campaigning and fundraising activities to help the plight of south Asia's vultures. The key strategies of vulture conservation SAVE is involved in a wide range of conservation activities across South Asia including:

- breeding vultures in captivity so that their offspring can be released back in to the wild when the environment is free from diclofenac
- an active advocacy programme targeting the vets and farmers using diclofenac
- legislation controlling the manufacture and sale of veterinary drugs
- in-situ conservation actions focused around the small but key remaining vulture populations in the wild

- an active research programme that underpins these activities and monitors their effectiveness

Project Dolphin Gangetic river dolphins is India's national aquatic animal and is often known as the 'Tiger of the Ganges'. This dolphin species is an indicator animal which represent healthy river ecosystem in a same position as a tiger in a forest. Their population is estimated to be less than 2,000 in the country. Some of the major threats are habitat fragmentation due to construction of dams and barrages, direct killing, indiscriminate fishing and pollution of rivers.

For conservation of dolphins, India's first Dolphin Community Reserve established in West Bengal to protect the endangered mammal, Gangetic river dolphins. The reserve would be set up in the Hooghly River between Malda and Sundarbans as per provisions of Wildlife Protection Act, 1972. State Forest department also has announced that it would also conduct a census to estimate the population of dolphins.

ENVIRONMENTAL LAWS

- The Water (Prevention and Control of Pollution) Act, 1974
- The Water (Prevention and Control of Pollution) Rules, 1975
- The Water (Prevention and Control of Pollution) Cess Act, 1977
- The Water (Prevention and Control of Pollution) Cess Rules, 1978
- The Air (Prevention and Control of Pollution) Act, 1981
- The Air (Prevention and Control of Pollution) Rules, 1982
- The Environment (Protection) Act, 1986
- The Environment (Protection) Rules, 1986
- Hazardous Wastes (Management and Handling) Rules, 1989
- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
- The Forest (Conservation) Act, 1980
- The Forest (Conservation) Rules, 1981
- The Wildlife Protection Act, 1972
- The Wildlife (Transactions and Taxidermy) Rules, 1973
- The Wildlife (Stock Declaration) Central Rules, 1973
- The Wildlife (Protection) Licensing (Additional Matters for Consideration) Rules, 1983
- The Wildlife (Protection) Rules, 1995
- The Wildlife (Specified Plants - Conditions for Possession by Licensee) Rules, 1995
- The Public Liability Insurance Act, 1991
- The Public Liability Insurance Rules, 1991
- The National Environment Tribunal Act, 1995
- The National Environment Appellate Authority Act, 1997

DISASTER MANAGEMENT

Hazards are the situations which occur on the earth surface and have the capability of impacting life, health, property and environment negatively. When they really start impacting they turned into disasters. Major types of natural disasters are:

- **Drought** is a period of unexpected rainfall deficit which results in a shortage of water, which develops slowly affecting an extensive area. The associated impacts of drought are the lack of adequate drinking water, loss of vegetation, loss of farmland, loss of livestock and loss of life due to famine or dehydration.
- **Floods** are the overflow of water from rivers and streams which submerge the connected dry lands caused due to excessive precipitation driven by atmospheric factors. They can be divided into two types, river flood and sea flood basing upon their place of occurrence.

The capital city 'Chennai' of Tamil Nadu along with its surrounding areas had faced one of the most dangerous and catastrophic flood situation during 1st and 2nd week of December 2015 as a result heavy down pour which had occurred from 28th, Nov to 4th Dec 2015.

- **Tsunamis** are the series of huge sea waves that strike a coast with the massive amount of water in the coastal areas as a result of underwater seismic disturbances. Hurricanes,
- **Earthquakes** are the vibration of the earth surface caused due to the convergence of two plates under the earth crust giving rise to physical damage such as demolition of buildings, rupture in the roads etc.

Nepal earthquake killed over 9,000 people and injured more than 23,000 occurred on 25th April 2015 with intensity of 7.8 on Richter Scale.

- **Tornadoes** are the localized gust of wind moving in a circular motion over the land surface. Generally they form funnel like structure and commonly termed as thunder storm as well.

A major torando broke out in Eads, Colorado tornado on May 9, 2015.

- **Hurricanes** are the typical disturbance of the North Atlantic and East Pacific Oceans. In other ocean basins they are known as **Typhoons, Tropical Cyclones, or Cyclones.** These are the low pressure zones over the ocean surface which continues to intensify as long as they are moving on it. Once they hit the coast they start to weaken and result into heavy down pour with high velocity of wind.

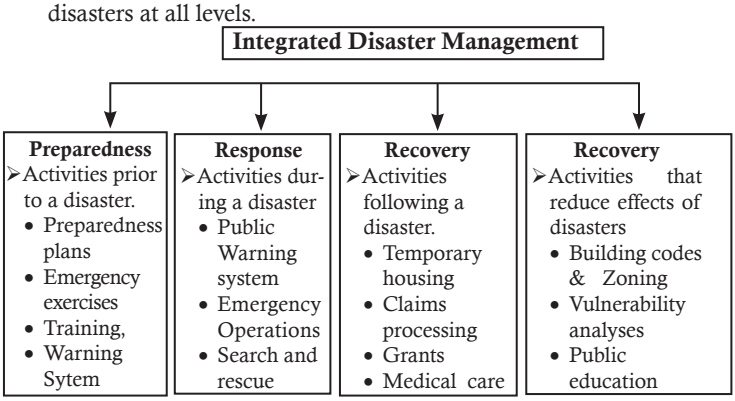
Typhoon Soudelor was one of the biggest disaster which hit Japan and Taiwan in August 2015 with a wind speed of 241km/h.
Cyclonic storm 'Komen' hit Bangladesh coast on 30 th July 2015, bringing heavy rainfall to Gangetic West Bengal and Odisha. The wind speed was approximately 300km/h.

- **Land Slide** is a downward movement of rock and soil debris that becomes detached from the underlying slope. The material can move by falling, toppling, sliding, spreading and flowing.

Uttarakhand faced one of the toughest situations of the century in form of a natural disaster with landslides and flash floods on 16 June 2013.

Managing a Disaster

- Disaster management practices are the policies, initiative or operational activities, that pertains to various stages of disasters at all levels.
- These are applied management practices with systematic observation and analysis of the types of disaster, measures of improvement related to prevention, emergency response, recovery and mitigation and finally planning for and responding to disasters including both pre and post disaster activities.



Institutional Framework for Disaster Management

The disaster management practice is an integrated effort of several institution who joins hand together to mitigate the problem and rehabilitate the victims in best possible way. The top down approach of the institutional framework for disaster management cell is as follows:

Disaster Management Structure

- NDMA Apex Body with Prime Minister as Chairperson.
- National Executive Committee - Secretaries of 14 Ministries and Chief of Integrated Defence Staff.

Centre Level

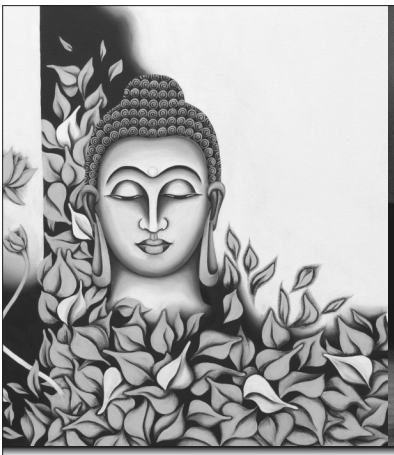
- Central Ministries; National Disaster Management Authority,
- National Institute of Disaster Management
- National Disaster Response Force (NDRF).

State Level

- SDMA headed by Chief Minister.
- State Executive Committee (SEC).

District Level

- DDMA headed by District Magistrate.
- Interface between Govt. and Public.







ART & CULTURE

ART & CULTURE

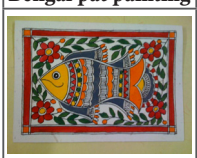
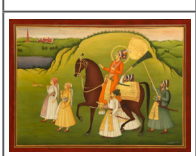
Culture plays an important role in the development of any nation. It represents a set of shared attitudes, values, goals and practices. Culture and creativity manifest themselves in almost all economic, social and other activities. A country as diverse as India is symbolized by the plurality of its culture.

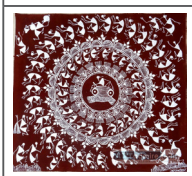
India has one of the world's largest collections of songs, music, dance, theatre, folk traditions, performing arts, rites and rituals, paintings and writings that are known, as the 'Intangible Cultural Heritage' (ICH) of humanity.

Art forms in India

The vibrant and colorful land of India is also famous for its versatility of its art and culture as each of the forms are different from each other in terms of their place of origin, creativity and raw materials used.

FAMOUS ART FORMS

Names	State of Origin	Materials Used
 **Patachitra painting**	The art form has its origin dates back in 5th century BC and and since then it has been lovingly nurtured in the areas like Raghurajpur Village in Puri district of Odisha	Canvas made of fine gauze-like cloth fortified with tamarind paste, chalk powder and gum and natural dyes for intricate painting over it
 **Bengal pat painting**	The indigenous art form belongs to Bengal and very interestingly it depicts spoofs on retrograde social practices, thus attempting to highlight them for change.	Artists use dye that are made of spices, earth, soot etc, and particularly red, indigo, green, black and ochre colours are seen widely in such painting
 **Madhubani painting**	This art form comes under the cultural legacy of Madhubani district of Bihar depicting mythological stories of Lord Krishna. Various geometric shapes have given emphasis on the colourful environment of Madhubani Painting Canvas.	Traditionally people were using mud coated wall as canvas for painting. But with time the canvases modified into cloth, handmade paper to give the painting the same authentic look. The colors used in the painting are derived from natural element like bamboo shoots, turmeric powder, Rice powder, flower extracts, pollens etc.
 **Miniature painting**	Developed during Mughal Period i.e. 16th – 19th century this style of painting are very small in size but having a lot of niceties of court life and the contemporary personalities, events and actions of the Mughal times.	The intricate designs are given form by using colours using precious stones conch shells, gold and silver

 **Tanjore art**	As the name indicates this form of art has its origin in Tanjore district of Southern Tamil Nadu depicting the stories of gods and goddess with an aristocratic touch.	Semi-precious stones, glass and gold are used to give the painting a royal look with embellished designs
 **Kalamkari**	This ethnic painting is a patronage of Golkonda and Mughal Sultanate and flourished near Kalahasti region of Chennai an Masulipatnam area of Hyderabad	The art is executed by fine pens made of bamboo and natural colours extracted from vegetables
 **Warli Painting**	This is a rudimentary wall painting with emphasis on graphical pattern and legacy of North Sahyadri Range in India. It's an age old tribal painting started during the 2500 or 3000 BCE depicts the nature, celestial body and human invention with different graphical shape	Typical natural elements such as Rice paste, mix with Gum and Water Red clay (Geru), cow dung, mud are used to give the painting an authentic tribal look
 **Gond art**	This is a tribal art form developed by Gond Tribes of Central India. The typical design Gond art with dots and lines depict the nature and social customs of the tribal community	These art forms are generally drawn on made on walls, ceilings and floors of village houses

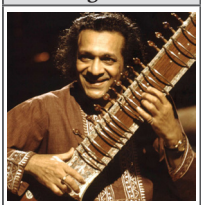
FAMOUS INDIAN PAINTERS

Rabindranath Tagore	7 May 1861 – 7 Aug 1941
Abanindranath Tagore	7 Aug 1871 – 5 Dec 1951
Amrita Sher-Gil	30 Jan 1913 – 5 Dec 1941
Jamini Roy	1 Apr 1887 – 24 Apr 1972
Francis Newton Souza	12 Apr 1924 -28 Mar 2002
S.H. Raza	22 Feb 1922 - Till date
Tyeb Mehta	25 Jul 1925 – 2 Jul 2009
Satish Gujral	25 Dec 1925 - Till date
Nandalal Bose	3 Dec 1882 – 16 Apr 1966
Manjit Bawa	1941-29 Dec 2008
M. F. Husain	17 Sep 1915 – 9 Jun 2011

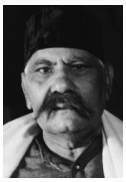
Indian Music

The music of India includes multiple varieties of folk music, pop and classical music. India's classical music tradition, including Hindustani music and Carnatic, has a history spanning millennia and developed over several eras. Music in India began as an integral part of socio-religious life.

LEGENDS OF INDIAN MUSIC

Legends	Life Span	Forte	Awards
 **Pandit Ravi Shankar**	7 April 1920 – 11 Dec 2012	Sitar	Grammy Award, Padma Bhushan, Magsaysay award, Padma Vibhushan, UNESCO International Music, Légion d'honneur, Sangeet Natak Akademi Award, Kalidas Samman, Bharat Ratna
 **Pandit Hariprasad Chaurasia**	1st July 1938	Bansuri	Sangeet Natak Academy, Padma Bhushan, Konark Samman, Yash Bharati Sanman, Padma Vibhushan, Dinanath Mangeshkar Award, Akshaya Sanman
 **Pandit Shivkumar Sharma**	January 13, 1938	Santoor	Sangeet Natak Akademi Award, honorary citizenship of the city of Baltimore, Padma Vibhushan, Padma Shri
 **Ustad Amjad Ali Khan**	9 October 1945	Sarod	UNESCO Award, Padma Bhushan, Padma Vibhusha, Unicef's National Ambassadorship, The Crystal Award by the World Economic Forum, Commander of the Order of Arts and letters
 **Ustad Bismillah Khan**	21 March 1913- 21 August 2006	Shehnai	Bharat Ratna, Fellow of Sangeet Natak Akademi, Bharat Ratna, Talar Mausiquee from Republic of Iran, Padma Vibhushan

 **Ustad Zakir Hussain**	9 March 1951	Tabla	Padma Bhushan,Padma Shri, Grammy, Sangeet Natak Akademi, Indo-American Award, India's National Academy of Music, Dance & Drama, National Heritage Fellowship of National Endowment for the Arts, National Heritage Fellowship of National Endowment for the Arts, Kalidas Samman
 **Pandit Bhimsen Gururaj Joshi**	4 February 1922 – 24 January 2011	Indian classical vocalist	Padma Bhushan, National Film Award for Best Male Playback Singer, Sangeet Natak Akademi Award, First platinum disc, Padma Vibhushan, Aditya Vikram Birla Kalashikhar Puraskar, Karnataka Ratna by Government of Karnataka, Maharashtra Bhushan, Maharashtra Bhushan
 **Pandit Jasraj**	28 January 1930-till date	Indian classical vocalist	Padma Vibhushan, Sangeet Natak Akademi Award, Padma Bhushan, Sangeet Kala Ratna, Master Dinanath Mangeshkar Award, Lata Mangeshkar Puraskar,Swathi Sangeetha Puraskaram, Sangeet Natak Akademi Fellowship
 **M. S. Subbulakshmi**	16 September 1916 – 11 December 2004	Classical vocalist	Padma Bhushan, Sangeet Natak Akademi Award, Sangeetha Kalanidhi, Ramon Magsaysay award, Padma Vibhushan, Sangeetha Kalasikhamani, Kalidas Samman, Indira Gandhi Award for National Integration, Bharat Ratna
 **Dr. Lakshminarayana Subramaniam**	23 July 1947-till date	Classical, Carnatic, jazz fusion, Indo jazz, world fusion, Western music	Lifetime Achievement Award, Limca Book of Records, GiMA (Best Carnatic Instrumental Album – Innovations), Asthana Vidwan, ISKCON, Bangalore , Viswa Kala Bharathi Bharat Kalachar, Chennai (2004), Sangeetha Kalaratna, Sangeetha Kalaa Shiromani, Padma Bhushan, Sangeeta Ratna Mysore, T. Chowdaiah Memorial National Award, Sangeeta Sagaram, Cultural Centre of Performing Arts, and many
 **M.Balamurali Krishna**	6 July 1930-till date	Carnatic music	Padma Vibhushan, Padma Bhushan, Sangita Kalanidhi by The Music Academy, "Sangeetha Virinchi"

 **Bade Ghulam Ali Khan**	2 April 1902 – 25 April 1968	Sarangi, Hindustani classic vocal	NA

Indian dance

There are many types of dance forms in India which are deeply religious in content to those which are performed on small occasions. The Indian dances are broadly divided into Classical dances and folk dances. The Classical dances of India are usually spiritual in content. Though the folk dances of India are also spiritual and religious in content but the main force behind the folk dances of India is the celebratory mood.

The most popular classical dance styles of India are Bharatnatyam of Tamil Nadu, Kathakali and Mohiniattam of Kerala, Odissi of Odisha, Kathak of Uttar Pradesh, Kuchipudi of Andhra Pradesh and Manipuri of Manipur.

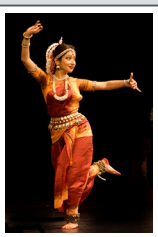
Indian Classical Dances

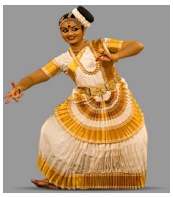
India has thousands of year old tradition of fine arts and classical and folk music and dances. Some of the world-famous dance forms that originated and evolved in India are Bharatnatyam, Kathak, Kathakali, Kuchipudi, Manipuri, Mohiniattam and Odissi. All these dance forms use basically the same 'mudras' or signs of hand as a common language of expression and were originally performed in the temples to entertain various Gods and Goddesses.

Indian Folk Dances

India is a land of varied cultures and traditions. Indian folk and tribal dances are product of different socio-economic set up and traditions. Indian folk and tribal dances are simple and are performed to express joy. In India we have festivals and celebrations virtually every day. This has added to the richness of Indian culture.

VARIOUS DANCE FORMS

Dance Forms	Origin	Lagends
 **Odissi**	Odissi is believed to be the oldest form of Indian dance from the state of Odisha, It is considered a dance of love, joy and intense passion, pure, divine and human. It divides the body into three parts, head, bust and torso	Kelucharan MohapatraSonal Mansingh Mayadhar Raut , Jhelum Paranjape, KumKum Mohanty, Madhumita Raut, Aloka Kanungo, Ileana Citaristi

 **Bharat Natyam**	Bharatnatyam is more popular in South Indian states. This dance is almost 2,000 years old. This dance flourished in the Hindu temples of South India.	Alarmel Valli, Yamini Krishnamurthy, Rukmini Devi, Padma Subramanyam, Yamini Krishnamurthy, Mrinalini Sarabhai, Meenakshi Sundaram Pillai, Padma Subramanyam, Balasarswati
 **Kuchipudi**	It presents scenes from Hindu Epics and mythological tales through dance-dramas combining music, dance and acting.	Bhavana Reddy, Yamini Reddy, Raja & Radha Reddy, Kaushalya Reddy
 **Kathak**	This north Indian dance form is inextricably bound with classical Hindustani music, and the rhythmic nimbleness of the feet is accompanied by the tabla or pakhawaj	Pandit Birju Maharaj, Kumudini Lakhiya, Sitara Devi, Shovana Narayan, Malabika Mitra, Kumudini Lakhiya, Kartik Ram - Kalyan Das, Manisha Gulyani
 **Kathakali**	It literally means story play and is an elaborate dance depicting the victory of truth over false-hood	Kalamandalam Krishna Prasad, Kavungal Chathunni Panicker, Kavungal Chathunni Panicker, Kalamandalam Ramankutty Nair, Kalamandalam Kesavan Namboodir, Kottakkal Sivaraman, Kalamandalam Gopi
 **Mohiniattam**	It is a very graceful dance meant to be performed as a solo recital by women.	Smitha Rajan, Sunanda Nai, Jayaprabha Menon, Pallavi Krishnan, Gopika Varma, Vijayalakshmi
 **Manipuri**	The most striking part of Manipur dance is its colorful decoration, lightness of dancing foot, delicacy of abhinaya (drama), lilting music and poetic charm	Poushali Chatterjee , Rajkumar Singhajit Singh, Sohini Ray, Guru Nileswar Mukharjee, Guru Bipin Singha

THEATRES AND FILMS

The rich Indian theater culture has its origin dates back in first century, CE, and started being nurtured by the society as means of expressing, communicating and sharing the ideas-opinions-emotions-believe of mankind. Since then it has gone through many ups and downs but the culture remain undaunted. Today many of Indian theatre have internationally acclaimed fraternity.

SOME OF THE IMPORTANT THEATRES OF MODERN INDIA

Name	Founder	Year and Place of Establishment	People Associated with it
National School of Drama (Deemed University)	Ministry of Culture, Government of India.	1959, New Delhi	Naseeruddin Shah, Irrfan Khan, Anupam Kher, Nawazuddin Siddiqui, Pankaj Kapur, Himani Shivpuri and many more
Bhartendu Academy of Dramatic Arts	Padma Shri Raj Bisaria.	1975, Lucknow,	Rajiv Jain, Raajpal Yadav, Anupam Shyam
Theatre Arts Workshop (TAW)	Raj Bisaria	1966, Lucknow	

Hindi Films

Bollywood is the Hindi Language film industry which is based in Mumbai, Maharashtra. They are one of the largest film producers in India and one of the largest centres of film production in the world. Raja Harishchandra (1913), by Dadasaheb Phalke, is known as the first silent feature film made in India. The first Indian sound film, Ardeshir Irani's Ara (1931), was a major commercial success. In 1937, Ardeshir Irani, of Alam ara fame, made the first colour film in Hindi, Kisan Kanya.

INDIA'S HIGHEST GROSSING FILMS

Movie	Year	Studio(s)/ Producers	Language	Worldwide gross
PK	2014	Vinod Chopra Films	Hindi	₹ 735 crore (US$110 million)
Bajrangi Bhaijaan	2015	Saliman Khan Films/Kabir Khan Films	Hindi	₹ 626 crore (US$93 million)
Baahubali The Begining	2015	Arka Media Works	Telugu and Tamil	₹ 600 crore (US$90 million)
Dhoom 3	2013	Yash Raj Films	Hindi	₹ 536 crore (US$80 million)
Cheennai Express	2013	Red Chillies Entertainment	Hindi	₹ 423 crore (US$63 million)
Prem Ratan Dhan Payo	2015	Rajshri Productions	Hindi	₹ 400 crore (US$ 60 million)
3 Idiots	2009	Vinod Chopra Films	Hindi	₹ 392 crore (US$ 59 million)/ ₹ 395 crore (US$59 million)
Happy New Year	2014	Red Chillies Entertainment	Hindi	₹ 383 crore (US$57 million)

TOURISM

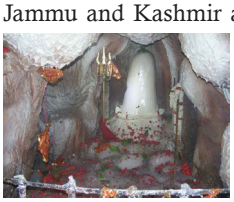
India has become a popular tourist destination with thousands of people visiting different parts of India each year. It has much to offer to travelers and tourists. It is a land of hills, rivers, plateaus, plains, beaches, deltas and deserts. Some of the major tourist destinations in India are the Himalayas, Agra, Jaipur,Goa, Kerala, Delhi, Odisha and Maharshtra.

Famous Tourist Destination in India

Akshardham Temple: The 108 feet tall temple was built on 2nd, November 1992 in memory of Pramukh Swami in Gandhinagar district of Gujarat.

Ajmer Sharif: It is sufi shrine dedicated to the sufi saint Moinuddin Chishti. It is situated Ajmer, Rajasthan. The Dargah attracts people from different faith who come and worship here.

Amarnath Cave: It is situated in Jammu and Kashmir and is one of



the ancient pilgrimages in India. It is famous for the Linga which is created naturally by ice every year. The Amarnath Yatra is an annual event taken up by Hindu pilgrims who reach the temple after a rigorous trek to the cave temple.

Ajanta and Ellora Caves: They contain a cluster of Hindu and Jian temples along with cave monuments. Ajanta along with Ellora caves are one of the major tourist attraction of Maharastra, Primarinly for their cave paintings.

Beaches of Goa: Goa is famous for its beautiful beaches, wonderful churches, wildlife sanctuary, goan cuisine, water sports and most happening night life. The well-known beaches of Goa are Baga Beach, Aguada Beach, Arambol Beach, Palolem Beach, Calangute Beach, Calangute Beach, Butterfly Beach, Colva Beach etc and the magnificent churches are Basilica of Bom Jesus, Rachol Seminary and Church, St. Alex Church, Church of St Francis of Assisi, Immaculate Conception Church, Se Cathedral.

Bandipur Wildlife Sanctuary: Established in 1947 Bandipur Wildlife sanctuary is well known for its tiger reserve. The entire area constitute the vast Nilgiri Biosphere Reserve which comprises the tracts of protected forest.

Badrinath: It is located in the Chamoli district in Uttarakhand. It is the most important of the four sites in India's Char Dham pilgrimage.



It is also gateway to several mountaineering expeditions headed to mountains like Nilkantha.

Bodhgaya: It is one of the most important and sacred Buddhist pilgrimage center in the world situated in Gaya district in Bihar. It is famous as the place where Gautama Buddha is said to have obtained Enlightenment under the Bodhi Tree.

Dwarkadhish Temple : The temple is situated o the bank of river Gomti and dedicated to lard Krishna, The

temple is constructed of limestone which is still in immaculate condition.

Dal Lake, Ladakh: The enchanting lake of Jammu and Kasmir bordered by ice covered mountains from three sides is famous for its gardens, shikara rides and house boat stay.

Golden Temple: A symbol of brotherhood and equality the Harmandir Sahib Gurudwara, is commonly called as Golden Temple is located in Amritsar is famous for its sanctity and is the main pilgrimage of sikh community but it welcomes a large no. of tourist every years despite of their religion cast and creed.



Gateway of India: It is a crude jetty made by British People in the year 1914 in Mumbai which is a basalt arc and having a height of 26 feet.

Haji Ali Dargah: The very famous dargah (tomb) is located on an islet of the coast of Worli in the Southern part of Mumbai built in 1431 in the memory of a wealthy merchant Sayyed Peer Haji Ali Shah Bukhari, who gave up all his worldly possessions before making a pilgrimage to Mecca

Hemkund Sahib: It is a Sikh place of worship situated in Chamoli district, Uttarakhand, India, devoted to Guru CiObind Singh Ji, the tenth Sikh Guru. The scenic beauty of the place is astounding as this shrine is located amidst lofty hills that are covered with snow.

Haridwar: It is one of the most ancient cities located on the banks of river Ganga in the state of Uttarakhand. The Kumbha Mela which happens once in every 12 years attracts millions to the city with devotees thronging the place all year round.

Incredible India

Incredible India is thae name of an international marketiing compaign by the government of India to promote tourism in India to an audience of global appeal

Jagannath Temple, Puri: It is a sacred Hindu temple dedicated to Lord Jagannath situated in Odisha and is one of the char dham pilgrimages that every Hindu intends to visit.



Jama Masjid: It is situated in Delhi and is one of the largest mosques in india. It was built by Shah Jahan between 1644 and 1656.

Kerala Backwaters: A chain of brackish water lagoons lying parallel to the Malabar Coast of Kerala in southern part of India which is a large web of water bodies i.e. five large lake interconnected natural and manmade canals and fed by 38 rivers.

Kanyakumari : The southernmost part of Tamilnadu which was formerly known as Cape Comorin and famous for place of tourist interests like Vivekananda Rock Memorial, Thiruvalluvar Statue, Our Lady of Ransom Church, Tsunami Memorial Park.

Kaziranga National Park: This national park was established in the year 1904 in Golaghat and Nagaon districts of the state of Assam are famous for the heavy population of one-horned rhinoceros. Among the other specialties of this national park tall elephant grass, marshland, and dense tropical moist broadleaf forests, river crisscross of four major rivers, including the Brahmaputra, and the park includes numerous small bodies of water are well-known.

Khajuraho Group of Monuments: It is a group of Hindu and Jain temples situated in Madhya Pradesh. The temples are famous for the nagara style architecture and erotic sculptures.

Konark Sun Temple: It is situated in Odisha. The iconic temple is in the form of a gigantic chariot, built in the 13th century. It also features on the list of seven wonders of India.

Lotus Temple: It is located in New Delhi, is a Bahai House of Worship constructed in 1986.

Mahabaleshwar: It is a vast magnificent plateau located at a distance of 120 km south west of Pune with an average height of 1353 meters. It is bound by valley from all sides and having some beautiful high rise peaks. The highest peak is known as Wilson or Sunset Point.

Mathura: It is known as the birthplace of Lord Krishna located 50 km North of Agra in Uttar Pradesh. The Krishna Janbhoomi temple is visited by a large number of devotees throughout the year. During Janmashtami the town becomes overcrowded with devotees from all over India.

Rishikesh: It is the starting point of the chardham pilgrimage situated in the Uttarakhand. The city is regarded as one of the holiest places to Hindus and also referred as the Yoga Capital of the World. It has innumerable Hindu temples and the heavy settlement of yoga centers.

The Great Rann of Kutch: It is a seasonal salt marsh is spread over an area of 7,505.22 square kilometers (2,897.78 sq mi) in Thar Desert. It is the land of various well known sanctuaries such as Wild Ass Sanctuary, bird-rich Nawa Talao lake, Nalsarovar Bird Sanctuary.

Somnath Mahadev Temple : Adding to the beauty of western ghat the famous Somnath Mahadev Temple of Prabhas Patan is believed to be the first among twelve Jyotirling of Shivas. The age old temple was initially built in the 11th century by Solanky rajput . but it was rebuilt in 1951.

Siddhivinayak Temple: It is one of the richest hindu temple built in the heart of Mumbai city on 19 November, 1801 built by Laxman Vithu and Debubai Patil.



Taj Mahal: It is a white marble mausoleum located on the southern bank of the yamuna river is Agra, Uttar Pradesh. It was built by Shah Jahan in 1632 in the memory of his loving wife Muntaz Mahal.



Tirumala Venkateswara Temple: It is an iconic vaishnavite temple located in Tirumala at Tirupati in Chittoor district of Andhra Pradesh. It is one of the most visited Hindu temples in India with a footfall of 60,000 pilgrims each day.

Valley of flowers: A national park situated in West Himalaya and renowned for its meadows of endemic alpine flowers and the variety of flora.
Vaishno Devi Temple, Jammu Kashmir: The temple is recognized as one of the "Shakti Peeths" of goddess Durga. The holy shrine is situated in the folds of mighty 'Tirkuta' Hills' which attracts lakhs of devotees from all parts of India and abroad.

Varanasi: It is one of the most popular pilgrimages for the Hindus. It houses one the Shakti Peethas and one of the twelve Jyotir Linga sites in India. The Ganga Arti performed ritualistically every morning and evening at the Ganga ghats which enhances its divinity.



TOP TEN MONUMENTS WITH HIGHEST DOMESTIC VISITORS IN INDIA

S. No.	Monuments	No. of Domestic Visitors	% age share
1.	Taj Mahal, Agra	5139640	11.9
2.	Qutub Minar, Delhi	2980710	6.9
3.	Red Fort, Delhi	2736699	6.4
4.	Sun Temple, Konark	2334556	5.4
5.	Agra Fort, Agra	1794737	4.2
6.	Golconda Fort, Hyderabad	1471232	3.4
7.	Charminar, Hyderabad	1397000	3.2
8.	Ellora Caves, Aurangabad	1336367	3.1
9.	Bibi – ka – Maqbara, Aurangabad	1276206	3.0
10.	Gol – Gumbaz, Bijapur	1064265	2.5

TOP TEN STATES WITH HIGHEST FOREIGN TOURIST ARRIVAL IN INDIA

S. No.	State	Number	% age share
1.	Maharashtra	4156343	20.8
2.	Tamil Nadu	3990490	20.0
3.	Delhi	2301395	11.5
4.	Uttar Pradesh	2054420	10.3
5.	Rajasthan	1437162	7.2
6.	West Bengal	1245230	6.2
7.	Kerala	858143	4.3
8.	Bihar	765835	3.8
9.	Karnataka	636378	3.2
10.	Goa	492322	2.5

HANDICRAFTS

India has got international acclamation in terms of its beautiful and creative handicrafts. Given below are the states with diversified crafts.

State	Handicrafts
Odisha	Weaving craft, palm leaf writing, patachitra- the chitrakar's foray, applique, stone carving, metal craft,
Delhi	Zardozi, lacquer work, clay and paper made dolls
Maharastra	Paithani saris, sawantwadi crafts, warli paintings, kolhapuri chappals, narayan peth
West Bengal	Artistic leather craft, brass & bell metal, pottery, mat making, dhokra metal casting, cane & bamboo, fine arts, clay dolls, horn work, jute products, shell & conch shell, sholapith, famous handloom sarees like dhakai jamdani, tangail etc
Gujrat	Bead-work, jewellery, inlay work, embroidery, wood carving, cloth printing, dyeing, patola fabric, zari work
Rajasthan	Tie-and-dye textiles, hand block printing, quilting, jewellery, gems and stones, blue pottery, leather craft, woodcarving
Himachal Pradesh	Jewelry, leather craft, woodcarving, architecture, kangra paintings
Goa	Pottery & Terracotta, Brass metal ware, Crochet & Embroidery, Bamboo Craft, Fiber Craft, Jute Macrame Craft, Coconut Mask carving, sea shell craft
Andhra Pradesh	Priceless Pearls
Karnataka	Woodcarving, Ivory carving
Jharkhand	Wood craft, paitkar paintings, metal work, stone carving, ornaments, toy making
Manipur	Wood carving, textile weaving, stone-carving, block printing, kauna (water reed) mat, hand-embroidery
Jammu & Kashmir	Carpets, Basket Weaving, Namdas, pashmina shawls, Papier-Mchie, Leather and fur, wood carvings

TOP INTERNATIONAL EVENTS OF ARTISTIC AND CULTURAL EVENTS

Events	Significance
Yale International Choral Festival	The event was organized to team up outstanding choir throughout the world in a five day ceremony of singing, learning and exploring the connections that choral music fosters between people
International Kinetic Art (Exhibit and Symposium)	The exhibition gave a platform to the kinetic art exhibitor to display their art work to the public throughout the world

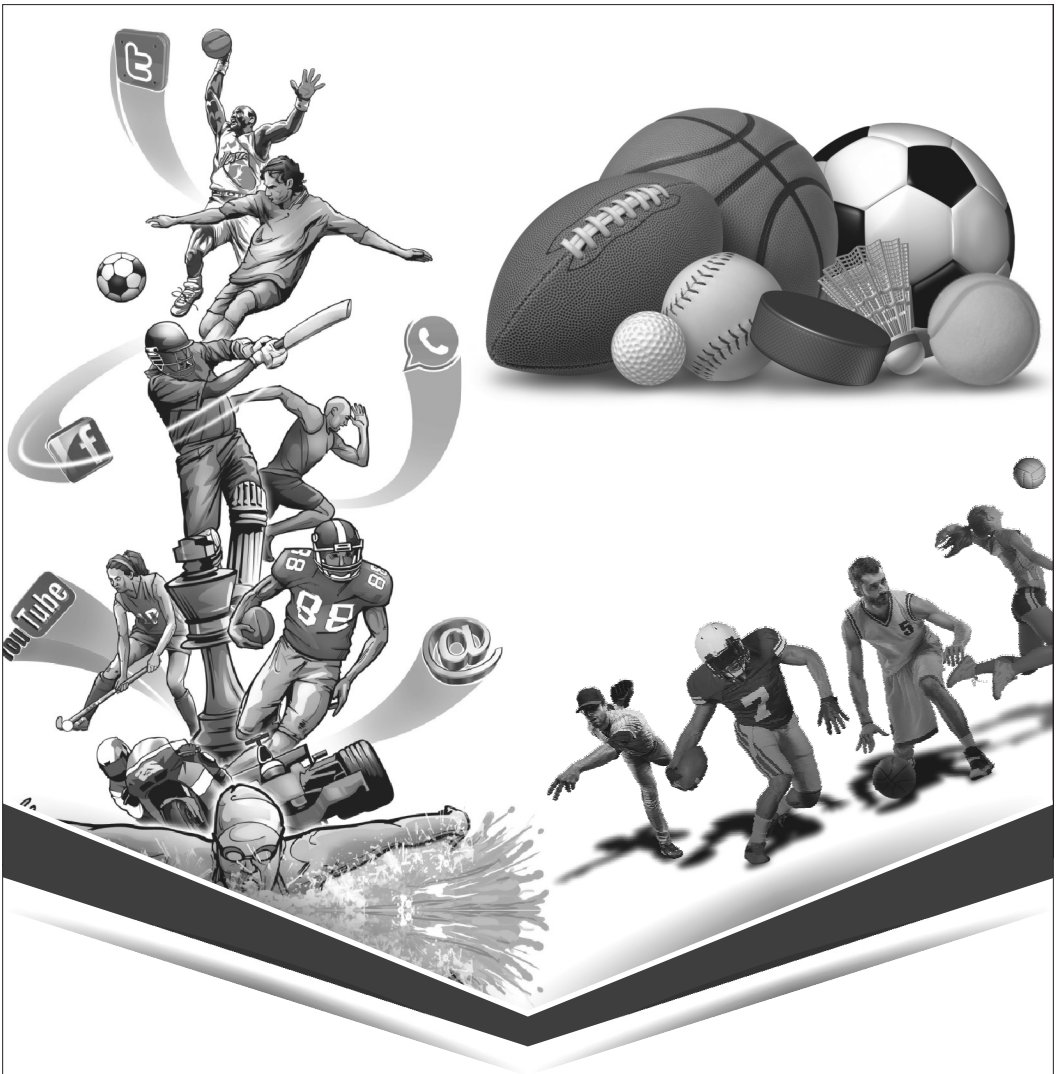
The International Indian Film Academy Awards	This set of awards presented annually by the International Indian Film Academy to honour both artistic and technical excellence of professionals in Bollywood, the Hindi language film industry
Global Indian Music Academy Awards	An event for giving honor and recognition to Indian Music
The Oscars Night	The highest honour of international film fraternity
Cannes Film Festival	A festival for showcasing the internationally acclaimed film from countries throughout the world

TOP TEN STATES

Rank	Area	Population	Density	UA	Literacy
1	Rajasthan	UP	Delhi	Delhi	Kerala
2	MP	Maharashtra	Chandigarh	Gr. Mumbai	Lakshadweep
3	Maharashtra	Bihar	Puducherry	Kolkata	Mizoram
4	AP	WB	Daman & Diu	Chennai	Tripura
5	UP	AP	Lakshadweep	Bangalore	Goa
6	J&K	MP	Bihar	Hyderabad	Daman & Diu
7	Gujarat	TN	WB	Ahmedabad	Puducherry
8	Karnataka	Rajasthan	Kerala	Pune	Chandigarh
9	Odisha	Karnataka	UP	Surat	Delhi
10	Chhattisgarh	Gujarat	D&NH	Jaipur	A&N

TOP TEN MONUMENTS WITH HIGHEST FOREIGN VISITORS IN INDIA

Monuments	No. of Foreign Visitors	% age share
1. Taj Mahal, Agra	695702	23.2
2. Agra Fort, Agra	363823	12.1
3. Qutub Minar, Delhi	307043	10.2
4. Humayun's Tomb, Delhi	276641	9.2
5. Fatehpur Sikri, Agra	255129	8.5
6. Red Fort, Delhi	141498	4.7
7. Mattancherry place Museum, Kochi	104717	3.5
8. Western Group of Temple, Khajuraho	89511	3.0
9. Excavated site, Sarnath	85991	2.9
10. Group of Monuments, Mamallapuram	70840	2.4



SPORTS

TROPHIES ASSOCIATED WITH SPORTS

NATIONAL

Name of the Trophy	Related game
Aga Khan Cup	Hockey
Barna Bellack Cup	Table Tennis
Beighton Cup	Hockey
Bombay Gold Cup	Hockey
Burdwan Trophy	Weight Lifting
D.C.M. Trophy	Football
Dhyan chand Trophy	Hockey
Dr. B.C. Roy Trophy	Football
Duleep Trophy	Cricket
Durand Cup	Football
Ezra Cup	Polo
I.F.A Shield	Football
Lady Ratan Tata Trophy	Hockey
Moin ud daula Gold Cup	Cricket
Rangaswami Cup	Hockey
Ranji Trophy	Cricket
Santosh Trophy	Football
Scindia Gold Cup	Hockey
Subroto Mukherjee Cup	Football (Inter-School)
Wellington Trophy	Rowing

INTERNATIONAL

Name of the Trophy	Related game
Nehru Trophy	Hockey
American Cup	Yatch Racing
Ashes Cup	Cricket (Australia-England)
Azlan Shah	Hockey
US Masters	Golf
Hopman Cup	Lawn Tennis
Colombo Cup Trophy	Football
Davis Cup	Lawn Tennis
Kings Cup Race	Air Races (England)
Merdeka Cup	Football (Asia)
Thomas Cup	World Badminton (Men)
Uber Cup	World Badminton (women)
US-Open	Lawn Tennis
French-Open	Lawn Tennis
Australian Open	Lawn Tennis
Wimbledon	Lawn Tennis
Masters Champions Trophy	Hockey
British Open	Golf
Malaysian Open	Badminton
Tata Open	Lawn Tennis

NUMBER OF PLAYERS ON EACH SIDE

Badminton	1 or 2	Polo	4
Baseball	9	Rugby Football	15
Basketball	5	Tennis and Table tennis	1 or 2
Cricket	11	Water Polo	7
Football	11	Volleyball	6
Hockey	11	Kabaddi	7
Chess	1		

NATIONAL SPORTS OF FAMOUS COUNTRIES

Name	National game
Australia	Cricket
Brazil	Football
Canada	Ice Hockey
China	Table Tennis
England	Cricket
India	Hockey
Japan	Judo or Ju Jitsu
Malaysia	Badminton
Pakistan	Hockey
Russia	Chess, Football
Scotland	Rugby, Football
Spain	Bull Fighting
United States of America	Baseball

TERMS USED IN SPORTS AND GAMES

Badminton	Deuce, Double, Drop, Fault, Game, Let, Love, Smash.
Baseball	Bunt, Diamond, Home, Pitcher, Put out, Strike.
Billiards	Break, Cannons, Cue, In off, Jigger, Scratch,
Boat Race	Cox
Boxing	Hook, Jab, Knock-out, Punch, Upper cut.
Bridge	Diamonds, Dummy, Grand slam, Little slam, Revoke, Ruff, Tricks, Trump.
Chess	Check, Checkmate, Gambit, Stalemate
Cricket	Bowling, Bouncer, Crease, Cover point, Drive, Duck, Follow on, Googly, Gulley, Hat Trick, Hit wicket, L.B.W. (Leg Before Wicket), Leg Break, Leg spinner, Leg bye Maiden over, No ball, Pitch, Run, Silly point, Stumped, Wicket keeper.
Football	Dribble, Drop Kick, Foul, Hattrick, Off-side, Penalty, Throw in, Touch Down.
Golf	Bogey, Caddie, Hole, Links, Put, Putting the green, Stymie, Tee.
Hockey	Bull, Carry, Centre Forward, Carried, Dribble, Goal, Hat trick, Penalty corner, Scoop, Short corner, Sticks, Striking circle, Under cutting.
Horse Racing	Jockey, Place, Protest, Punter, Win.
Lawn Tennis	Back-hand-drive, Service, Smash, Volley, Deuce, Game, Set, Love.
Polo	Bunder, Chuckker, Mallet.
Rifle Shooting	Bull's eye.
Rugby	Drop kick, Screen.
Swimming	Stroke.
Volley ball	Booster, Deuce, Love, Service, Spikers.
Wrestling	Half Nelson, Heave.

HOCKEY

A game resembling hockey was first played in ancient Egypt around 2050 BC. The modern game was evolved in the British Club established in 1861. The English Hockey Association was formed at Cannon Street Hotel, London in 1875.

Hockey World Cup

The concept for an international hockey competition at the world level originated in a joint proposal made by India and Pakistan at an International Hockey Federation FIH council meeting on March 30, 1969. The first world cup was held in Barcelona (Spain) in 1971. From 1978 onwards, the tournament has been held once in four years. India has won the tournament only once in 1975.

A LOOK AT HOCKEY WORLD CUP

Year	Host	Winner	Runner-up
1971	Spain	Pakistan	Spain
1973	Netherlands	Netherlands	India
1975	Malaysia	India	Pakistan

1978	Argentina	Pakistan	Netherlands
1982	India	Pakistan	West Germany
1986	England	Australia	England
1990	Pakistan	Netherlands	Pakistan
1994	Australia	Pakistan	Netherlands
1998	Netherlands	Netherlands	Spain
2002	Malaysia	Germany	Australia
2006	Germany	Germany	Australia
2010	India	Australia	Germany
2014	Netherlands	Australia	Netherlands
2018	India	–	–

COMMONWEALTH GAMES

The Commonwealth Games are a festival of sports of the commonwealth countries. The games are held once in four years but only in between the Olympic years. When the games first began in 1930, only 11 countries participated. The Games were originally known as the British Empire Games. These have undergone a change of name and expanded into a major multiracial and cultural event.

COMMONWEALTH GAMES SINCE 1930

Year	Places	Participant Countries	Competitions	First Place	India's Medal
1930	Hamilton (Canada)	11	6	England	Not participated
1934	London (England)	16	6	England	1 Bronze Medal
1938	Sydney (Australia)	15	7	Australia	No medal
1950	Auckland (New Zealand)	12	9	Australia	Not Participated
1954	Vancouver (Canada)	24	9	England	No medal
1958	Cardiff (Wales)	35	9	England	Gold-2, Silver-1
1962	Perth (Australia)	35	9	Australia	Not Participated
1966	Kingston (Jamaica)	34	9	England	Gold-3,Silver-4,Bronze-5
1970	Edinburgh (Scotland)	42	9	Australia	Gold-5,Silver-3
1974	Christchurch (New Zealand)	38	9	Australia	Gold-4,Silver-8,Bronze-3
1978	Edmonton (Canada)	46	10	Canada	Gold-5,Silver-4,Bronze-6
1982	Brisbane (Australia)	46	10	Australia	Gold-5,Silver-5,Bronze-3

1986	Edinburgh (Scotland)	26	10	England	Not Participated
1990	Auckland (New Zealand)	55	10	Australia	Gold-13,Silver-8,Bronze-7
1994	Victoria (Canada)	63	10	Australia	Gold-6,Silver-11,Bronze-10
1998	Kuala Lumpur (Malaysia)	70	16	Australia	Gold-07,Silver-10,Bronze-8
2002	Manchester (England)	72	17	Australia	Gold-32,Silver-21,Bronze-19(Third Position)
2006	Melbourne (Australia)	71	16	Australia	Gold-22,Silver-17,Bronze-11(Fourth Position)
2010	Delhi (India)	71	17	Australia	Gold-74,Silver-55,Bronze-48(Second Position)
2014	Glasgow (Scotland)	71	18	England	Gold-15,Silver-30,Bronze-19(Fiveth Position)
2018	Gold Coast (Australia)	Proposed			

SAF GAMES

The SAF games was first held in 1984 at Kathmandu, Nepal. The seven participating countries are India, Pakistan, Sri Lanka, Bangladesh, Nepal, Bhutan and Maldives. The motto of SAF games is "Peace, Prosperity and Progress". The games year 1986 edition was not staged as it was a year of Commonwealth and Asian Games. **New Name For SAF Games:** The SAF Games have been rechristened as South Asian Games, according to a decision taken by the South Asian Sports Federation at its 32nd meeting held in Islamabad (Pakistan) on April 2, 2004.

Year	Games	Host City	Country
2010	XI	Dhaka	Bangladesh
2013	XII	New Delhi	India
2014	XIII	Kathmandu	Nepal
2016	XIV	Hambantota	Sri Lanka

OLYMPIC GAMES

Olympic Games are an international sporting event which is organised in the form of summer and winter sports. The Summer Olympic Games were first held in 1896. The Winter Olympic Games were created after the huge success of the Summer Olympics. Baron Pierre de Coubertin founded the International Olympic Committee (IOC) in 1894. The Olympic Games are held after every four years, with the Summer and Winter Games alternatively occurring every four years but two years apart from each other.

The Olympics games originated in the city of Olympia, an ancient city of Greece. These games were held at Mount Olympia. India officially participated in the Olympics for the first time in the year 1920, in the 6th edition of the games at Antwerp, Belgium.

The Olympic flag is made up of white silk and contains five intertwined rings as the Olympics emblem.



The colour of rings represents different continents as given below:

Blue	Europe
Yellow	Asia
Black	Africa
Red	America
Green	Australia and Ocenia

Winter Olympic Games

Winter Olympic games were started in the year A.D. 1924. The first game, were held at chamonix (France). The winter games are numbered in rotation as they are held. The programme at the winter games includes ice hockey, figure skating, speed skating, alpine sking, skiting, etc. Like the summer games, the winter games are also awarded gold silver and bronze medals.

Year	Venue	Year	Venue
1924	Chamonix, France	1980	Lake placid, New York
1928	St. Moritz, Switzerland	1984	Sarajevo, Yugoslavia
1932	Lake Placid, New York	1988	Calgary, Canada
1936	Garmisch – Parten/Kirchen, Germany	1992	Albertville, France
1948	St. Mortiz, Switzerland	1994	Lillehammer, Norway
1952	Oslo, Norway	1998	Nagano, Japan
1956	Cortina d' Ampezz, Italy	2002	Salt Lake City, USA
1960	Squaw Valley, United States	2006	Turin, Italy,
1964	Innbruck, Austria	2010	Vancouver, Canada
1968	Grenoble, France	2014	Sochi, Russia
1972	Sapporo, Japan	2018	Pyeongchang, South Korea
1976	Innsbruck, Austria	2022	Beijing, China

SUMMER OLYMPICS

Year	Host	Opened by	Nations
1896	Athens, Greece	King George I	14
1900	Paris, France	–	24
1904	St. Louis, United States	Governor David R. Francis	12
1908	London, United Kingdom	King Edward VII	22
1912	Stockholm, Sweden	King Gustaf V	28
1920	Antwerp, Belgium	King Albert I	29
1924	Paris, France	President Gaston Doumergue	44
1928	Amsterdam, Netherlands	Prince Hendrik of the Netherlands	46
1932	Los Angeles, United States	Vice President Charles Curtis	37
1936	Berlin, Germany	Chancellor Adolf Hitler	49

1948	London, United Kingdom	King George VI	59
1952	Helsinki, Finland	President Juho Kusti Paasikivi	69
1956	Melbourne, Australia	Prince Philip, Duke of Edinburgh	72
1960	Rome, Italy	President Giovanni Gronchi	83
1964	Tokyo, Japan	Emperor Hirohito	93
1968	Mexico City, Mexico	President Gustavo Díaz Ordaz	112
1972	Munich, West Germany	President Gustav Heinemann	121
1976	Montreal, Canada	Queen Elizabeth II	92
1980	Moscow, Soviet Union	Chairman Leonid Brezhnev	80
1984	Los Angeles, United States	President Ronald Reagan	140
1988	Seoul, South Korea	President Roh Tae-woo	159
1992	Barcelona, Spain	King Juan Carlos I	169
1996	Atlanta, United States	President Bill Clinton	197
2000	Sydney, Australia	Governor-General Sir William Deane	199
2004	Athens, Greece	President Konstantinos Stephanopoulos	201
2008	Beijing, China	President Hu Jintao	204
2012	London, United Kingdom	Queen Elizabeth II	204
2016	Rio de Janeiro, Brazil		206

PARALYMPIC GAMES

- Back in 1948, Sir Ludwig Guttman, a neurologist who was working with World War II veterans with spinal injuries at Stoke Mandeville Hospital in Aylesbury, began using sport as part of the rehabilitation programmes of his patients. He set up a competition with other hospitals to coincide with the London Olympics in that year.
- The Paralympics are elite sport events for athletes from six different disability groups. Athletes include those with mobility disabilities, intellectual disabilities, visual impairments, cerebral palsy and amputees.
- This event focuses on the athletes' achievements rather than their disabilities.
- Paralympic sports include athletics, cycling, judo, rowing, swimming, and volleyball.
- The Paralympic Games are always held in the same year as the Olympic Games. The name comes from the fact that it runs parallel to the Olympic Games hence the name Paralympics.
- The first Paralympic Games were held in Rome, Italy, in 1960 and involved 400 athletes from 23 countries. Originally, only wheelchair athletes were invited to compete.
- The Paralympics are held in two seasons: summer and winter.
- Athletes with disabilities have been competing in the Winter Games since 1976. Sweden hosted the first Winter Games, which included 12 countries competing in Alpine and Cross-Country Skiing events.
- International Paralympic Com-

mittee: (IPC) is the global governing body of the Paralympic Movement. The IPC organizes the Summer and Winter Paralympic Games, and serves as the International Federation for nine sports, for which it supervises and co-ordinates the World Championships and other competitions.

Winter Paralympic Games

2002 - Paralympics VIII - Salt Lake City - United States
2006 - Paralympics IX - Turin - Italy
2010 - Paralympics X - Vancouver Canada
2014 - Paralympics XI - Sochi - Russia

Summer Paralympic Games

2000 - Paralympics XI - Sydney - Australia
2004 - Paralympics XII - Athens - Greece
2008 - Paralympics XIII - Beijing-China
2012 - Paralympics XIV - London - United Kingdom
2016 - Paralympics XV - Rio de

ASIAN GAMES

The idea of the Asian Games was first conceived by Prof. G.D. Sondhi. The suggestion for holding the Asian Games was first made in a conference of Asian countries held in New Delhi in 1947 and Jawaharlal Nehru suggested that it be called 'Asian Games'. The first Asian Games were held at New Delhi in March 1951. Since then Asian Games are held after every four years.

ASIAN GAMES SINCE 1951

Games Serial	Year	Places	Number of Countries	Number of Sports	Number of Players
1	1951	New Delhi(India)	11	6	491
2	1954	Manila(Philippines)	18	8	1021
3	1958	Tokyo(Japan)	20	13	1422
4	1962	Jakarta(Indonesia)	16	13	1545
5	1966	Bangkok(Thailand)	18	14	1945
6	1970	Bangkok(Thailand)	18	13	1752
7	1974	Tehran(Iran)	25	16	2869
8	1978	Bangkok(Thailand)	25	19	3000
9	1982	New Delhi(India)	33	21	3447
10	1986	Seoul(S.Korea)	27	25	3883
11	1990	Beijing(China)	37	27	4500
12	1994	Hiroshima(Japan)	42	34	7300
13	1998	Bangkok(Thailand)	41	38	7000
14	2002	Busan(S.Korea)	44	38	7711
15	2006	Doha(Qatar)	45	39	9524
16	2010	Guangzhou(China)	45	42	9704
17	2014	Incheon(South Korea)	45	36	9501
18	2018	Jakarta (Indonesia)	Scheduled		

FIFA World Cup 2014

The FIFA World Cup 2014 was the 20th FIFA World Cup, the tournament for the association football world championship, which took place at several venues across Brazil. Germany was the finalist and won the tournament and grabbed its fourth title, it was first after its reunification of West and East Germany in 1990. It defeated Argentina by 1–0 in the final in extra time– the same result as the 1990 FIFA World Cup Final. The tournament began on 12 June with a group stage and concluded on 13 July with the championship match. Brazil hosted this championship for second time, the first was in 1950.



TENNIS GRAND SLAMS

The four Grand Slam tournaments also called majors, are the most important annual tennis events. The Grand Slam itinerary consists of the 'Australian-open' in mid January, the 'French open' in May/June 'Wimbledon' in June/July, and the 'US open' in August /September. Each tournament is played over a period of two weeks.

Grand Slams	Nature of Court
1. Australian open	Hard court
2. French open	Clay court (Red)
3. Wimbledon	Grass court
4. U.S. Open	Hard court

ATP/WTA Rankings	No ATP/WTA Rankings
ATP world tour finals	Davis Cup
WTA Tour Championships	Fed Cup
ATP Masters 1000 olympics	World Team Cup
ATP 500 Series	Hopman Cup
ITF Men's Circuit	
ITF Women's Circuit	

US OPEN 2015

Men's Singles:	Novak Djokovic (Serbia)
Women's Singles:	Flavia Pennetta (Italy)
Men's Doubles:	Pierre-Hugues Herbert & Nicolas Mahut (France)
Women's Doubles:	Martina Hingis (Switzerland) & Sania Mirza (India)
Mixed Doubles:	Martina Hingis (Switzerland) & Leander Paes (India)

AUSTRALIAN OPEN 2015

Men's Singles:	Novak Djokovic (Serbia)
Women's Singles:	Serena Williams (USA)
Men's Doubles:	Simone Bolelli & Fabio Fognini (Italy)
Women's Doubles:	Bethanie Mattek-Sands (USA) & Lucie Šafárová (Czech Republic)
Mixed Doubles:	Martina Hingis (Switzerland) & Leander Paes (India)

FRENCH OPEN 2015

Men's Singles:	Stan Wawrinka (Switzerland)
Women's Singles:	Serena Williams (USA)
Men's Doubles:	Ivan Dodig (Croatia) & Marcelo Melo (Brazil)
Women's Doubles:	Bethanie Mattek-Sands (USA) & Lucie Šafárová (Czech Republic)
Mixed Doubles:	Bethanie Mattek-Sands (USA) & Mike Bryan (USA)

WIMBLEDON 2015

Men's Singles:	Novak Djokovic (Serbia)
Women's Singles:	Serena Williams (USA)
Men's Doubles:	Jean-Julien Rojer (Netherlands) & Horia Tecau (Romania)
Women's Doubles:	Martina Hingis (Switzerland) & Sania Mirza (India)
Mixed Doubles:	Leander Paes (India) & Martina Hingis (Switzerland)

ICC CRICKET WORLD CUP

The four time winner of the ICC Cricket World Cup once again proved their dominance over the World cricket by defeating New Zealand in the 11th edition of the Cricket World Cup to bag their 5th World Cup title which was jointly hosted by Australia and New Zealand. Australia defeated New Zealand in a nail biting finale by 7 wickets in day night match played at the Melbourne Cricket Ground.

Scores : New Zealand 183 all out (Grant Elliot 83, Taylor 40, Mitchell Johnson 3 for 30 and James Faulkner 3 for 36) Australia 186-3 in 33.1 overs (Steve Smith 56, Michael Clarke 74, Warner 45, MJ Henry 2 for 46 and Boult 1 for 40)



Man of the Match: JP Faulkner (Australia)

Player of the series: MA Starc; 22 wickets (Australia)

Highest Run getter: Martin Guptill, 547 runs (New Zealand)

Quarter-finals			Semi-finals			Final		
A1	**New Zealand**	**393/6**						
B4	West Indies	250						
			B2	South Africa	281/5			
			A1	**New Zealand**	**299/6**			
A3	Sri Lanka	133						
B2	**South Africa**	**134/1**						
						A1	New Zealand	183
						A2	**Australia**	**186/3**
B3	Pakistan	213						
A2	**Australia**	**216/4**						
			A2	**Australia**	**328/7**			
			B1	India	233			
B1	**India**	**303/6**						
A4	Bangladesh	193						

IPL 2015

The Mumbai Indians team led by Rohit Sharma outshone the consistent performance of the Dhoni's Chennai Super Kings by winning the final of the Pepsi IPL-8 at the Eden Gardens. Led by the fiery batting performances of opener Lendl Simmons (68) and skipper Rohit Sharma (50), the Mumbai Indians notched 202 runs in the allotted 20 overs. Chennai Super Kings succumbed to 161 for eight in its quota of 20 overs while chasing the mammoth score.

Score: Mumbai Indians 202 for 5 in 20 overs (Lendl Simmons 68, Rohit Sharma 50, Dwayne Bravo 2 for 36) Chennai Super Kings 161 for 8 in 20 overs (Dwayne Smith 57, Suresh Raina 28, Mitchell McClenaghan 3 for 25)



Man of the Match: Rohit Sharma

Orange Cap for the tournament: David Warner, Sunrisers Hyderabad (562 runs)

Purple Cap for the tournament: Dwayne Bravo, Chennai Super Kings (26 wickets)

INDIAN SUPER LEAGUE

The Indian Super League (ISL) also known as the Hero Indian S League is a professional football league in India. The league consists of eight franchise teams from all around India. The Indian Super League was founded in 2013 in an effort to make football a top sport in India and to make Indian football a major player worldwide. The inaugural season of the league started on 12th October 2014 and concluded on 20th December 2014. The inaugural season was won by Atlético de Kolkata when it defeated the Kerala Blasters in the final 1–0.

TEAMS

Team	City/State	Stadium
Atlètico de Kolkata	Kolkata, West Bengal	Salt Lake Stadium
Chennaiyin	Chennai, Tamil Nadu	Jawaharlal Nehru Stadium
Delhi Dynamos	Delhi	Jawaharlal Nehru Stadium
Goa	Margao, Goa	Fatorda Stadium
Kerala Blasters	Kochi, Kerala	Jawaharlal Nehru Stadium
Mumbai City	Mumbai, Maharashtra	DY Patil Stadium
North East United	Guwahati, Assam	Indira Gandhi Athletic Stadium
Pune City	Pune, Maharashtra	Shree Shiv Chhatrapati Sports Complex

Top Scores

The defending champions Atlético de Kolkata were defeated in the semi-finals by Chennaiyin. The final was played between Goa and Chennayin on 20th December 2015 at the Fatorda Stadium in Goa. Chennayin became the champions by defeating Goa 3-2 in the final.

Rank	Player	Club	Goals
1	Stiven Mendoza	Chennalyin FC	13
2	Iain Hume	Atlètico de Kolkata	11
3	Reinaldo	Goa	7
	Sunil Chhetri	Mumbai City	
5	Antonio German	Kerala Blasters	6
	Chris Dagnall	Kerala Blasters	
	Jeje Lalpekhlua	Chennalyin	
8	Nicolàs Vèlez	NorthEast United	5
	Arata Izumi	Atlètico de Kolkata	

UEFA CHAMPIONS LEAGUE

UEFA Champions League also known as Champions League is a yearly continental club football competition organised by the Union of European Football Associations (UEFA), played by top-division European clubs. The club competition was launched one month after UEFA's first Congress, held in Vienna on 2 March 1955. There are total of 32 teams who are drawn into eight groups of four teams each and play each other in a double round-robin system. The current champions are Barcelona, who secured their fifth title in the competition after defeating Juventus 3–1 in the 2015 Final.

ALL-TIME TOP SCORES

Rank	Player	Goals	Appearances	Years	Clubs
1	Cristiano Ronaldo	88	121	2003-	Manchester United, Real Madrid
2	Lionel Messi	80	102	2005-	Barcelona
3	Raùl	71	142	1995-2011	Real Madrid, Schalke 04
4	Ruud van Nistelrooy	56	73	1998-2009	PSV, Manchester United, Real Madrid
5	Thierry Henry	50	112	1997-2010	Manaco, Arsenal, Barcelona
6	Alfredo Di Stèfano	49	58	1955-1964	Real Madrid
7	Andriy Shevchenko	48	100	1994-2012	Dynamo Kyiv, Milan, Chelsea
8	Eusèbio	46	65	1961-1974	Benfica
	Karim Benzema	46	77	2006-	Lyon, Real Madrid
	Fllippo Inzaghi	46	81	1997-2012	Juventus, Milan





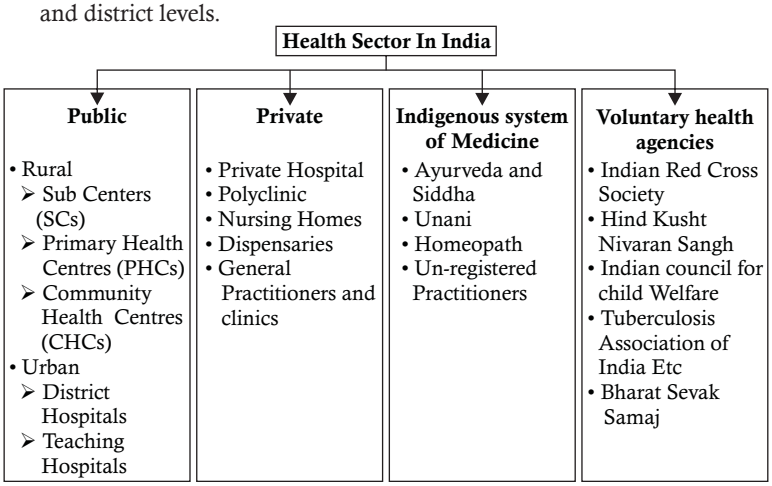
HEALTHCARE

HEALTHCARE IN INDIA

The healthcare services of India have seen tremendous growth in the past few years which can be revealed by different indicators and health parameters. Inspite of this fact, the expenditure on healthcare is very less i.e. 4% of the GDP and private parties have the dominance over the sector.

Healthcare Infrastructure in India

- Primary, secondary and tertiary care institutions, manned by medical and paramedical personnel;
- Medical colleges and para-professional training institutions to train the needed manpower and give the required academic input;
- Programme managers managing ongoing programmes at central, state and district levels.



Problems in India

- Poor Sanitation
- Infectious and non-communicable diseases
- High Infant Mortality Rate
- Malnutrition

Major Concerns in last decade

- India ranked 67th among the top developing countries with a doctor patient ratio of 0.7 doctors per 1000 patient (The World Bank).
- A wide gap between urban and rural population in terms provision of medical facilities.
- Poor facilities in large Government institutions compared to corporate hospitals.
- Increasing cost of curative medical services, high tech curative services not free.
- India leading the world in dengue,most rapidly spreading mosquito-borne viral disease.
- Malaria is still a major concern for Indian Health sector.
- Tuberculosis is the biggest threat to India with 2.2 million tuberculosis patients.
- Hepatitis C patients lack access to affordable treatment and care.

NATIONAL HEALTH PROGRAMMES

National AIDS Control Programme (AIDS)

A division of Ministry of Health and Family Welfare,was established in 1992 to prevent and control HIV/AIDSinfectionthrough35HIV/AIDS Prevention and Control Societies.

National Cancer Control Programme (Cancer)

Launched in 1975 with an initiation of giving priority for equipping the premier cancer hospital/institutions. The further evolution has added few otherimportantaspectswhichinclude recognition of new Regional Cancer Centre, strengthening of existing RegionalCancerCentres,development ofoncologyunits,DistrictCancerControl Programme etc.

Pulse Polio Campaign (Do Boond Zindegi Ke)

Initiated in 1978 the programme aimed at preventing polio by vaccinating against the disease. It was the extended programme of Universal Immunisation Program which successfully covered 95% of the country and as a result India was declared Polio free in 2014.

National Filaria Control Programme (filariasis)

Launched in the state since 1957 with an objective:

- To carry out surveys in different parts of the state where the problem was known to exist in order to determine the extent of prevalence, types of infection and their vectors.
- To undertake large scale pilot studies to evaluate the known methods of filariasis control in selected areas in different parts of states.
- Totrainprofessionalandancillary personnel required for the programme.

National Leprosy Eradication Programme (NLEP)

Launched in 1955 is a centrally sponsored Health Scheme of the MinistryofHealthandFamilyWelfare, Govt. of India with an objective of eliminating Leprosy with the use ofMultidrugtherapy(MDT)inphases.

Eliminate Kala-azar

A part of National Heath Policy envisaged in 2010 to eradicate the dreaded disease 'Kala-azar' or Visceral Leishmaniasis, also known as 'Black Fever' and 'Dumdum Fever' from India by 2015.

National TB Control Programme

Launched in 1962 with an objective of eradication of the disease but till 1992 only 30% of the country had been covered. So the programmes has been revised in 1993 with an objective of achieving and maintaining a cure rate of 85% among newly detected infectious (new sputum smear positive) cases. This resulted in the coverage of 450 million populations which is more than 80% in 2004.

TB-Mission 2020

- TB Mission 2020 was announced by the Union Ministry of Health and Family Welfare on 28th October 2014 at WHO's Global TB Symposium in Barcelona with an initiative to eliminate Tuberculosis in India by 2020.
- The Indian government will take up projects of providing free diagnosis, treatment, nutrition support and financial aid to the affected patients.

National Tobacco Control Programme

Launched in 2007 by the Ministry of Health and Family Welfare with objectives:

- To bring about greater awareness about the harmful effects of tobacco use and about the Tobacco Control Laws.
- To facilitate To facilitate effective implementation of the Tobacco Control Law.

National Rural Health Mission (NRHM)

Launched on 5th April,2005. The mission initially started for:

- Creation of cadre of Accredited Social Health Activist (ASHA)
- Strengthening all the CHCs, PHCs and Sub centres
- Mainstreaming AYUSH (Indian System of Medicine)
- Integrating health and family welfare programme
- Developing capacities for preventive health care at all levels
- Promotion of public private partnerships for achieving public health goals
- Strengthening capacities for data collection, assessment and review for evidence based planning, monitoring and supervision

National Urban Health Mission (NUHM)

Launched by the former Union Health Minister Ghulam Nabi Azad in 2014 under National Health Mission (NHM). The scheme will focus on primary healthcare needs of the urban poor. The main objectives are to:

- Improve the health care status of the urban population particularly the poor and other disadvantaged sections.
- Strengthen public health care system.
- Involve the community and urban local bodies in healthcare delivery.
- Supplement the National Rural Health Under a unified National Health Mission.

Special Focus on:

- Urban Poor Population living in listed and unlisted slums.
- All other vulnerable populations such as homeless, rag-pickers, street children, rickshaw pullers, construction site workers, sex workers and any other temporary migrants.

Mission Indradhanush

- Mission Indradhanush was launched to immunize all children against seven vaccine preventable diseases including diphtheria, whooping cough (Pertussis), tetanus, polio, tuberculosis, measles and hepatitis B by the year 2020.
- The mission involves four special vaccination campaigns which will be conducted between the months of April and July 2015, focussing on intensive planning and monitoring of these campaigns.
- The campaigns will be planned and executed in accordance with the learning from the successful implementation of the polio programme.
- The focus of the systematic immunization drive will be comprehended through a "catch-up" campaign mode with the aim to cover the left out children who missed out immunization.
- The mission will be carried out in 2 phases in 2015 in which the first phase will cover 201 districts, while the second phase will cover 297 districts.
- The Government has recognised 201 districts across 28 states in the country with 82 districts from Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh having 25% children who are unimmunized or partially immunized.

Swachh Bharat Abhiyan

- The Swachh Bharat Mission was officially launched by Prime Minister Narendra Modi on 2nd October 2014, covering 4041 statutory towns with the purpose to clean the streets, roads and infrastructure of the nation.
- The mission aims to make the nation 'open defecation free' by 2019 through construction of IHHL (individual household latrines), cluster toilets and community toilets.
- SBH also aims at eradication of manual scavenging.
- It also involves 100% collection and processing/disposal/reuse/recycling of municipal solid waste.
- The campaign involves generation of awareness among the citizens regarding sanitation and public health.
- The mission encourages private sectors to participate in construction and maintenance of sanitary facilities as a part of corporate social responsibility initiative. L&T has announced the construction of 5000 toilets across the nation as the part of their CSR initiative.

National Bal Swachhta Mission

- The National Bal Swachhta Mission was launched by the Union Government on 14th November 2014, on the 125th birth anniversary of India's first prime minister Jawahar Lal Nehru.
- The Bal Swachhta Mission is an integral part of the famous sanitation drive 'Swachh Bharat Mission'.
- The six themes to be included in the mission are:
  1. Clean Anganwadis
  2. Clean Surroundings like Playgrounds
  3. Clean Self (Personal Hygiene/ Child Health)
  4. Clean Food
  5. Clean Drinking Water.
  6. Clean Toilets
- Bal Swachhta Week will be observed from 14th to 19th November under this mission.

RECENT OUTBREAK OF MAJOR DISEASES IN INDIA

Disease	Time of Outbreak	Symptom	Recommended Treatment
Influenza A (H1N1) virus	2009	• Chills • Fever • Cough • Sore Throat • Runny or Stuffy Nose • Body Aches • Fatigue • Diarrhea	Use of anti viral drugs such as • Oseltamivir (brand name Tamiflu®), • Zanamivir (brand name Relenza®) • Peramivir (brand name Rapivab®)
Swine flu	2014-2015	• Cough • Fever • Headache • Sore Throat • Muscle Pain • Chills • Vomiting Or Diarrhea.	• Vaccination to prevent infection. • Oseltamivir (brand name Tamiflu®), • Zanamivir (brand name Relenza®)
Hepatitis	2009	• Liver Inflammation, • Vomiting • Jaundice.	• Lamivudine (Zeffix®) • Adefovir (Hepsera®) • Entecavir (Baraclude®) • Tenofovir (Viread®) • Pegylated Interferon (Pegasys®)

Dengue	2014-2015	• High Fever, Possibly As High As 105°F (40°C) • Pain Behind The Eyes And In The Joints, Muscles And/Or Bones • Severe Headache • Rash Over Most Of The Body • Mild Bleeding From The Nose Or Gums • Bruising Easily	• As such there is no such specific drugs for treating Dengue. However doctors prescribe Acetaminophen (Tylenol, others) for alleviating pain and reduce fever.
Cholera	2010	• Mild fever • Body ache • Abdominal pain and cramps • Lethargy and fatigue • Excessive thirst • Headaches • Loss of elasticity of the skin	• Antibiotic • Oral Health drink to prevent dehydration
Plague	1994	• Sudden onset of fever • Headache • Chills • Weakness and one or more swollen, tender and painful lymph nodes (called buboes)	• Streptomycin • Gentamicin • Tetracycline • Chloramphenicol • Doxycycline • Oxytetracycline • Sulfamethoxazole/ trimethopri
Chikungunya	1963-1973	• Arthritis like pain around the joints • Muscle aches • Fever • Malaise • Headache • Fatigue • Nausea • Vomiting	• Aspirin • Non-steroidal inflammatory drugs • Chloroquine Phosphate

YOGA and its Health Benefit

A healthy lifestyle is a function of healthy mind and body, and so as to keep a person really healthy, YOGA is just a master stroke. It's an ascetic Hindu discipline which involves practices like controlling breath with prescribed body position and meditation with an objective to attain a state of deep spiritual insight and tranquility**.** These practices in turn promote good health, fitness and control of mind. Sage Patanjali was known to be the founder of this practice and the knowledge he had given was known as **Yoga Sutra.** In recent years, this age-old practice has been revitalized by several spiritual leaders like Baba Ramdev, Sadhguru who have made tireless efforts to propel yoga to each and every corner of India for improving health condition of India and make the people strong and immune enough to combat day to day or serious health issues. The United Nations has declared June 21 as the International Day of Yoga.







COMMUNICATION, TRANSPORT, NEWS & MEDIA

COMMUNICATION

Post Office

- The Department of Posts was founded in India on 1st April, 1774.
- This department serves as an agent of Govt.
- It provides services like letter post, parcel service, EMS, delivery, freight forwarding, third-party logistics, and deposit accounts, saving banks, retailing, life insurance, remittance etc.
- Indian Post has been terminated two of its major services such as Telegram and Money order in July 2013 and April 2015 respectively due to the increasing pressure of electronic communication media, but still continues with the services of electronic money order (eMO) and instant money order (IMO) which were introduced in 2008.



Quick Facts

Founder of Telegraph and Postal System in India	: Governor General Lord Dalhousie
First General Post Office opened in India	: 1774 (Kolkata)
First postage stamp of India	: Sinde Dawk (1852)
Pin system started in India	: 1972
The First Indian Post Office Outside India	: Dakshin Gangotri in Antarctica (1983), Indian Territory
Speed Post started in India	: 1986
Money Order System	: 1880
Postal Life Insurance started	: 1884
Postal Staff College situated at	: Ghaziabad (UP)
World Postal Day is observed on	: 9th October
Indian Postal Day is observed on	: 10th October

Telecommunication

- Telecommunication occurs when the exchange of information between two or more entities includes the use of technology.
- Communication technology uses channels to transmit information (as electrical signals), either over a physical medium (such as signal cables), or in the form of electromagnetic waves.
- Early means of communicating over a distance included visual signals, such as beacons, smoke signals, semaphore telegraphs, signal flags, and optical heliographs.
- Other examples of pre-modern long-distance communication included audio messages such as coded drumbeats, lung-blown horns, and loud whistles.
- Modern technologies for long -distance communication usually involve electrical and electromagnetic technologies, such as telegraph, telephone, and teleprinter, networks, radio, microwave transmission, fiber optics, and communications satellites.

- A revolution in wireless communication began in the first decade of the 20th century with the pioneering developments in radio communications by Guglielmo Marconi, who won the Nobel Prize in Physics in 1909.
- Other highly notable pioneering inventors and developers in the field of electrical and electronic telecommunications include Charles Wheatstone and Samuel Morse (telegraph), Alexander Graham Bell (telephone), Edwin Armstrong, and Guglielmo Marconi (radio), as well as Vladimir K. Zworykin, John Logie Baird and Philo Farnsworth (television).



The Telecommunications system in India is the 2nd largest in the world. Telephone services was introduced in 1881-82 in Kolkata for the first time and first automatic exchange was opened up at Shimla in 1913-14 with a capacity of 700 lines only. In 1850, the first experimental electric telegraph line was started between Calcutta and Diamond Harbour. In 1851, it was opened for the use of the British East India Company. The construction of 4,000 miles (6,400 km) of telegraph lines was started in November 1853. These connected Kolkata and Peshawar in the north; Agra, Mumbai through Sindwa Ghats, and Chennai in the south; Ootacamundand Bangalore. William O'Shaughnessy pioneered the telegraph and telephone in India. A separate department was opened in 1854 when telegraph facilities opened to the public.

Mobile Communication

- A mobile phone is a telephone that can make and receive calls over a radio frequency carrier while the user is moving within a telephone service area.
- Modern mobile phones support a variety of services, such as text messaging, MMS, email, Internet access, short-rangewireless communications (infrared, Bluetooth), business applications, gaming, and photography. Mobile phones which offer these and more general computing capabilities are referred to as Smartphone.

The first handheld mobile phone was demonstrated by John F. Mitchell and Martin Cooper of Motorola in 1973, using a handset weighing c. 4.4 lbs (2 kg). In 1983, the DynaTAC 8000x was the first commercially available handheld mobile phone.



- Mobile computing is human–computer interaction by which a computer is expected to be transported during normal usage. Mobile computing involves mobile communication, mobile hardware, and mobile software.
- Wireless data connections used in mobile computing take three general forms. Cellular data service uses technologies such as GSM, CDMA or GPRS, 3G networks such as W-CDMA, EDGE or CDMA 200 and more recently 4G networks such as LTE, LTE-Advabced.
- GSM (Global System for Mobile Communications, is to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones, first deployed in Finland in July 1991.

- Code division multiple access (CDMA) is a channel access method used by various radio communication technologies. CDMA is used as the access method in many mobile phone standards such as cdmaOne, CDMA2000 (the 3G evolution of cdmaOne), and WCDMA (the 3G standard used by GSM carriers), which are often referred to as simply CDMA.
- 3G, short form of third generation, is the third generation of mobile telecommunications technology. 3G telecommunication networks support services that provide an information transfer rate of at least 200 kbit/s.
- 4G, short for fourth generation, is the fourth generation of mobile telecommunications technology, succeeding 3G. A 4G system must provide capabilities defined by ITU in IMT Advanced. Potential and current applications include amended mobile web access, IP telephony, gaming services, high-definition mobile TV, video conferencing, 3D television, and cloud computing.

Bharti Airtel launched India's first 4G service, using TD-LTE technology, in Kolkata on 10 April 2012.

Communications Satellite

- A communications satellite is an artificial satellite that relays and amplifies radio telecommunications signals via a transponder; it creates a communication channel between a source transmitter and a receiver(s) at different locations on Earth.
- Communications satellites are used for television, telephone, radio, internet, and military applications.
- There are over 2,000 communications satellites in Earth's orbit, used by both private and government organizations.
- The first artificial Earth satellite was Sputnik 1. Put into orbit by the Soviet Union on October 4, 1957, it was equipped with an on-board radio-transmitter that worked on two frequencies: 20.005 and 40.002 MHz. Sputnik 1 was launched as a step in the exploration of space and rocket development.



India has launched 80 Indian satellites (as of 11th November 2015) of many types since its first in 1975. The organisation responsible for India's satellite program is the Indian Space Research Organisation (ISRO). On 11 November 2015, India's latest communication satellite GSAT-15 was successfully launched at 03:04 am by Ariane-5 rocket in the early hours from the spaceport of Kourouin French Guiana in South America.

Electronics and Information Technology

National Knowledge Network

- The objective of the National Knowledge Network (NKN) is to interconnect all institutions of higher learning and research with a high speed data communication network to facilitate knowledge sharing and collaborative research.
- It will bridge the existing knowledge gap in the country. It will help the country evolve as a Knowledge Society and spur economic activities in the

Knowledge domain. Under this Network, it is proposed that the core and associated links to around 1500 institutions shall be established in 2-3 years time.

Application Areas

- Agriculture
- Education
- Health
- e-governance
- Grid Computing (High Performance Computing)

TDIL

- The Department of Information Technology initiated the ambitious programme of (Technology Development for Indian Languages) with the aim of developing Information Processing Tools and Techniques to facilitate human-machine interaction without language barrier; creating and accessing multilingual knowledge resources and integrating them to develop innovative user products and services.
- The primary objectives include developing and promoting Software Tools and Applications for all 22 officially recognized Indian Languages, contributing to collaborative development of futuristic technologies leading to innovative products and services, acting as a catalyst for proliferating Language Technology products and providing solutions and standardization across all levels.
- Some of the other major initiatives undertaken are in the realm of Cross Lingual, Information Access and Retrieval, Human Machine Interface systems, Text to Speech system (TTS), Language processing and Web tools, adapting IT Tools and solutions in Indian languages, Human Resource Development in Language Technology etc.

TRANSPORT

Indian Road Network

- India has a road network of over approx. 4,689,842 kilometers.
- The Central Government is responsible for development and maintenance of the National Highways system.
- The Ministry carries out development and maintenance work of National Highways through three agencies. viz. National Highways Authority of India (NHAI), State Public Works Department (PWDs) and Border Road Organization (BRO).
- National Highways Development Project (NHDP) is the largest highway project ever taken in the country.

Quick Facts

Categories	Dimensions in Kms (up to 2011)	Responsible Authority
National Highways	92,851	Ministry of Road Transport and Highways (Central government)
State Highways	1,63,898	State governments (State's public works department)
Major and Other District Roads	17,05,706	Local governments, Panchayats and Municipalities
Rural Roads	27,49,805	Local governments, Panchayats and Municipalities

National Highways Development Projects

Golden Quadrilateral : It comprises construction of 5,846 km long 4/6 lane, high density traffic corridor, to connect India's four big metro cities of Delhi-Mumbai-Chennai and Kolkata. With the construction of Golden Quadrilateral, the time- distance and cost of movement among the mega cities of India will be considerably minimised.

North-South and East-West Corridors: North-South corridor aims at connecting Srinagar in Jammu and Kashmir with Kaniyakumari in Tamil Nadu (including Kochchi-Salem Spur) with 4,076 km long road. The East-West Corridor has been planned to connect Silchar in Assam with the port town of Porbandar in Gujarat with 3,640 km of road length.

Important National Highways

NH	Connects
NH 1	New Delhi-Ambala-Jalandhar-Amritsar
NH 2	Delhi-Mathura-Agra-Kanpur- Allahabad-Varanasi-Kolkata
NH 3	Agra-Gwalior-Nasik-Mumbai
NH 4	Thane and Chennai via Pune and Belgaum
NH 5	Kolkata-Chennai
NH 6	Kolkata-Dhule
NH 7	Varanasi-Kanyakumari
NH 8	Delhi-Mumbai (via Jaipur, Boroda & Ahmedabad)
NH 9	Mumbai-Vijaywada
NH 10	Delhi-Fazilka
NH 24	Delhi - Lucknow
NH 26	Lucknow-Varanasi

Indian Railways

Indian Railways is a state-owned enterprise and one of the world's largest railway networks comprising 115,000 km of track over a route of 65,808 km and 7,112 stations.Indian Railways is the second most important means of communication in India contributing 1% to the gross domestic product from transportation point of view. It was founded on April 16, 1853.

In terms of gauge the Indian railway is divided into three types.

- Broad gauge contributing 63%
- Meter gauge contributing 31%
- Narrow gauge contributing 6%



INDIAN RAILWAYS ZONES AND THEIR HEADQUARTERS

Name	Route (km)	Headquarters
Southern (SR)	5098	Chennai
Central (CR)	3905	Mumbai
Western (WR)	6182	Mumbai
Eastern (ER)	2414	Kolkata
Northern (NR)	6968	Delhi
North Eastern (NER)	3667	Gorakhpur
South Eastern (SER)	2631	Kolkata
Northeast Frontier (NFR)	3907	Maligaon
South Central (SCR)	5951	Secunderabad
East Central (ECR)	3628	Hajipur
North Western (NWR)	5459	Jaipur
East Coast (ECoR)	2677	Bhubaneswar
North Central (NCR)	3151	Allahabad
South East Central(SECR)	2447	Bilaspur
South Western(SWR)	3177	Hubli
West Central (WCR)	2965	Jabalpur

TOP TEN STATES WITH LONGEST RAIL NETWORK IN IN INDIA

Rank	State	Route Km.
1.	Uttar Pradesh	8832
2.	Rajasthan	5872
3.	Maharashtra	5725
4.	Andhra Pradesh	5322
5.	Gujarat	5257
6.	Madhya Pradesh	4955
7.	West Bengal	4037
8.	Tamil Nadu	4027
9.	Bihar	3656
10.	Karnataka	3228

TOP TEN COUNTRIES WITH LONGEST RAIL NETWORK IN THE WORLD

Rank	Country	Route Km.
1.	USA	250000
2.	China	100000
3.	Russia	85500
4.	**India**	**65000**
5.	Canada	48000
6.	Germany	41000
7.	Australia	40000
8.	Argentina	36000
9.	France	29000
10.	Brazil	28000

Metro Rail

Metro Rail was started in India on 24th October, 1984 in Kolkata. By far it has covered the major metropolitan cities like Delhi, Mumbai, Hyderabad, Chennai, Kochi and Bangalore. With 8 operational metro systems, metro rail lines are composed of both standard gauge and broad gauge.

SCENARIO OF METRO RAIL IN P FOUR METROPOLIS

City	Owner	Began Operation	Distance in Kms
Kolkata	Kolkata Metro Rail Corporation	24 October 1984	28.14 km
Delhi	Delhi Metro Rail Corporation Limited (DMRCL)	24 December 2002	213 km
Mumbai	Mumbai Metropolitan Region Development Authority (MMRDA)	8 June 2014	11.4 km
Chennai	Chennai Metro Rail Limited (CMRL)	29 June 2015	10km



Kolkata Metro: Kolkata Metro is the first mass rapid transit system in the country and India's Oldest Metro Railway. The Line 1 North-South Metro of 25 kilometers is in the operation with 23 stations of which 15 are underground station. Kolkata Metro is also the first in country to build an operational underground railway. There are 5 more railway lines under construction at the different corner of Kolkata, West Bengal.

Chennai Metro: Chennai is second city in India to run a rapid transit system in 1995, Chennai Mass Rapid Transit System is an elevated railway line run within the city from Chennai Beach to Velachery.Chennai Metro Rail project consist both elevated and underground section.

Delhi Metro: Delhi Metro has 6 lines of 189.63 kilometers with 142 railway stations of which 35 are underground. Delhi Metro consist combination of at-grade,underground and elevated lines.

Bangaluru Metro: Bengaluru Metro also known as Namma Metro is recently started rapid transit rail system in the Bengaluru city of Karnataka.

Mumbai Metro : Mumbai, the financial and commercial capital of India is all set to provide another mode of transport to the people. Mumbai is already running Monorail system, the first monorail in India. Mumbai metro is opened and over 10 lakh commuters traveled on the city's first Metro train. It covers the 11.4 km-long journey from Versova-Andheri-Ghatkopar corridor.

Hyderabad Metro : Hyderabad Metro is under construction with 3 lines and covering a distance of around 71 km for the city. The Hyderabad Metro is the first public-private partnership metro project in India. Hyderabad is already running a Multi-Modal Transport System for particular routes.

Jaipur Metro: The pink city of Rajasthan is got its first metro line of 9.2 km from Mansarovar to Chandpole Bazaar in November 2010. Rajasthan is one of the most visited tourist place in India, specially international tourist and Jaipur is best place to enjoy royal Rajasthan.

Aviation industry

Aviation industry is the highly growing market, in terms of World Economy. It targets to be the third largest market by 2020 and to be in the first position by 2030. Over the next five years, the industry will experience an increase in the domestic and international

passenger traffic at an annual average rate of 12 per cent and 8 per cent, respectively.

Air transport in India made a beginning in 1911 when airmail operation commenced over a little distance of 10 km between Allahabad and Naini. But its real development took place in post-Independent period. The Airport Authority of India is responsible for providing safe, efficient air traffic and aeronautical communication services in the Indian Air Space. The authority manages 125 airports.



5/20 rule : The rule allows an Indian carrier to fly abroad only after it has completed five years of domestic operations and maintains a fleet of 20 aircrafts.

Major Aviation Industry	Commenced operations	Owner
IndiGo	8 April 2006	Rahul Bhatia of Inter Globe Enterprises and Rakesh Gangwal
Jet Airways and Jetlite	1st April, 1992	Naresh Goyal
SpiceJet	5th May, 1993	ModiLuft
Air India	15th October, 1932	JRD Tata
Go Air	November 2005	Bombay Dyeing and Britannia
Air India Express	29th April, 2005	Govt. of India
AirAsia India	28th March 2013	Tony Fernandes
Air Costa	15 October, 2013	LEPL group

100 Golden Years of Civil Aviation in India:

1911: The first commercial civil aviation flight in India took place in India between Allahabad and Naini, covering a distance of 6 miles.

1912: The first London-Karachi-Delhi flight was introduced by Indian State Air Services in collaboration with UK based Imperial Airways.

1924: Construction of civil airports in India in Calcutta at Dum Dum, Allahabad at Bamrauli and in Bombay in Gilbert Hill.

1929:JRD Tata became the first licensed pilot of Federation Aeronautique International on behalf of the Aero Club of India and Burma.

1931: Lt Col. Shelmerdine became the Director General of Civil Aviation (DGCA).

1934: Formation of Indian Aircraft Act.

1937: Regulation of Indian Aircraft Act.

1948: Prem Mathur became the first female commercial pilot to start flying for Deccan Airways, as she obtained her commercial pilot's license in 1947.

1953: Nationalization of entire airline industry under the Air Corporations Act.

1956: Ms. Durba Banerjee was inducted as the first woman pilot of Indian Airlines.

1972: Airport Authority of India constituted.

1976: Airbus A300 was introduced for domestic services.

1990-93: Entry of private airlines after the de-regulation of the civil aviation sector.

2006: Government approved restructuring and modernisation of Mumbai and Delhi Airport through Public Private Partnership.

2010: The colossal Terminal 3 (T-3) integrated terminal was inaugurated at New Delhi's Indira Gandhi International Airport.

2012: In September foreign airlines have given permission to attain a stake of up to 49% in domestic airlines.

BUSIEST AIRPORTS IN INDIA

Rank	Name	City	State	IATA Code
1.	Indira Gandhi International Airpot	Delhi	Delhi	DEL
2.	Chhatrapati Shivaji International Airport	Mumbai	Maharashtra	BOM
3.	Kempegowda International Airport	Bangalore	Karnataka	BLR
4.	Chennai International Airport	Chennai	Tamil Nadu	MAA
5.	Netaji Subhash Chandra Bose International Airport	Kolkata	West Bengal	CCU
6.	Rajiv Gandhi International Airport	Hyderabad	Telangana	HYD
7.	Cochin International Airport			
8.	Sardar Vallabhbhai Patel International Airport	Ahmedabad	Gujarat	AMD
9.	Pune International Airport	Pune	Maharashtra	PNQ
10.	Goa International Airport	Dabolim	Goa	GOI

Water Ways

India has 14,500 km of navigable waterways, contributing about 1% to the country's transportation. It comprises rivers,canals, backwaters, creeks, etc. At present, 5,685 km of major rivers are navigable by mechanised flat bottom vessels.For the development, maintenance and regulation of national waterways in the country,the Inland Waterways Authority was set up in1986.

NATIONAL WATERWAYS OF INDIA

Waterways	Stretch	Specification
NW 1	Allahabad-Haldia stretch (1,620 km)	It is divided into three parts for developmental purposes– (i) Haldia-Farakka (560 km), (ii) Farakka-Patna (460 km), (iii) Patna- Allahabad (600 km).
NW 2	Sadiya-Dhubri stretch (891 km)	Brahmaputra is navigable by steamers up to Dibrugarh (1,384 km) which is shared by India and Bangladesh.
NW 3	Kottapuram-Kollam stretch (205 km).	It includes 168 km of west coast canal along with Champakara canal (23 km) and Udyogmandal canal (14 km).
NW 4	Specified streches of Godavari and Krishna rivers along with Kakinada Puducherry stretch of canals (1078 km)	

NW 5	Specified stretches of river Brahmani along with Matai river, delta channels of Mahanadi and Brahmani rivers and East Coast canals (588km).	

Ports

Indian coastline is about 7516.6 kilometers and it is one of the biggest peninsulas in the world. It is serviced by 12 major ports, 200 notified minor and intermediate ports. Maharashtra (48) has the maximum number of non-major ports followed by Gujarat (42) and Andaman & Nicobar Islands (23).

- The Major Ports are administered by the central government's shipping ministry.
- The Minor and Intermediate ports are administered by the relevant departments or ministries in the nine coastal states.

The Coastal States in India are Andhra Pradesh, Odisha, West Bengal, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat.

Name of the Port	Coast	State
Kandla	Western Coast	Gujarat
Mumbai	Western Coast	Maharashtra
Jawaharlal Nehru	Western Coast	Maharashtra
Marmugoa	Western Coast	Goa
Manglore	Western Coast	Karnataka
Kochi	Western Coast	Kerala
Haldia	Eastern Coast	West Bengal
Paradip	Eastern Coast	Odisha
Vishakapatnam	Eastern Coast	Andhra Pradesh
Chennai	Eastern Coast	Tamil Nadu
Ennore	Eastern Coast	Tamil Nadu
Tutikorin	Eastern Coast	Tamil Nadu



Interesting Facts about Major Ports of India

- Kandla Port is located on the Gulf of Kutch. It is the largest port of India by volume of cargo handled. It is a tidal port having a free trade zone.
- Mumbai Port is the biggest port in our country. It handles one-fifth of India's foreign trade with predominance in dry cargo and mineral oil from the Gulf countries.

- Jawaharlal Nehru is the trend-setter of port development in India through new initiatives like private sector participation.
- Mormugao Port is the leading iron ore exporting port of India with an annual out-put of around 27.33 million tonnes of iron ore traffic.
- New Mangalore Port is an all weather port and the only major port of Karnataka. Panambur is the site of sea port called New Mangalore Port.
- Kochi port is a natural harbour on the west coast. It largely handles coal, petroleum products, fertilisers, raw materials and general cargo.
- Paradip Port is an artificial and deep-water port.
- Ennore Port, officially renamed Kamarajar Port Limited, is the only corporatised major port and is registered as a company.
- Jawaharlal Nehru Port is the largest container port in India. It was formerly known as Nhava Sheva port.
- Tuticorin Port is an artificial deep-sea harbour of India. Tuticorin Port is officially known as VO Chidambaranar Port.
- Madras Port is the one of the oldest port of India and the second largest port in the country.

NEWS & MEDIA

Newspaper

Newspaper is the print media usually prints information, the activities and happenings around us, generally categorized into daily and weekly basis. It was introduced way back in 1780.

Quick facts

Event	Publishing Year	Name of the Publication
First newspaper in India	1780	Hicky's Bengal Gazette or Calcutta General
First newspaper from Bombay	1789	Bombay Herald
First newspaper in Hindi	1854	Samachar Sudha Varshan

Registrar of Newspapers is a statutory body of Government of India which is popularly known as RNI. It was established on 1st July 1956 with an objective of regulating and monitoring the printing and publication of newspapers based on the Press and Registration of Books Act, 1867. It has both statutory and non-statutory functions.

E-paper : It is a display technology which is the reusable and refreshable version of a traditional newspaper that hold information electronically. This type of newspaper is available free of cost on internet and can be accessed anywhere.

TOP DAILY NEWSPAPERS IN INDIA (ACCORDING INDIAN READERSHIP SURVEY 2014)

	Newspaper	Language	Owner
1	Dainik Jagran	Hindi	Owned by Jagran Prakashan Ltd.
2	Hindustan	Hindi	Owned by Hindustan Media Ventures Ltd. owned by HT Media Ltd
3	Dainik Bhaskar	Hindi	Owned by D B Corp Ltd.
4	Malayala Manorama	Malayalam	Owned by Malayala Manorama Company Ltd.
5	Daily Thanthi	Tamil	Founded by S. P. Adithanar
6	Rajasthan Patrika	Hindi	Owned by Rajasthan Patrika Pvt. Ltd.
7	Amar Ujala	Hindi	Owned by Amar Ujala Publications Ltd.
8	Times of India	English	Owned by Bennett, Coleman and Co. Ltd.
9	Mathrubhumi	Malayalam	Owned by The Mathrubhumi Group
10	Lokmat	Marathi	Owned by Lokmat Media Limited
11	Ananda Bazar Patrika	Bengali	Owned by Ananda Publishers
12	Hindustan Times	English	Owned by HT Media Ltd

TOP TEN INTERNATIONAL DAILY NEWSPAPERS

Name of the Newspaper	Country of Publication
The New York Times	United States
The Daily Mail	United Kingdom
The People's Daily	China
The Washington Post	United States
The Daily Telegraph	United Kingdom
The Guardian	United Kingdom
USA Today	United States
The Wall Street Journal	United States
China Daily	China
Los Angeles Times	United States
The Independent	United Kingdom
The Times of India	India
The Examiner	United States
Daily News	United States
Financial Times	United Kingdom

Press Trust of India (PTI) was incorporated in Madras on, 27th August, 1947 but started providing full-fledged news and information both in Hindi and English medium from 1st February,1949.It's a non-profit sharing cooperative organization and known for its unbiased news coverage. The corporate and registered officesare located at Sansad Marg, New Delhi and D N Road, Mumbai respectively. It has a news channel known as PTI-TV featuring documentaries.

United News of India (UNI) was founded on December 1961under the company acts. However its commercial application started on 21st March 1961.

Samachar Bharti came into being in 1967. It was supported by states like Bihar, Gujarat, Rajasthan and Karnataka. Samchar Bharti is well known for its services of news, sports, entertainment image stories and many more. It merged with other three agencies to form a nationalized news agency Samachar inFebruary 1976.

Prasar Bharti is an autonomous body set up by an Act of Parliament on 23 Nov, 1997. It has two major divisions Doordarshan Television Network and All India Radio. It is known to be the largest broadcasting agency in India.

All India Radio (AIR) or Akashwani was formed in 1930 as a part of Prasar Bharti. It is considered to be one of the nation's premier Public Service Broadcasters which truly lives up to its motto of 'Bahujan Hitaya: Bahujan Sukhaya'.At the beginning AIR started broadcasting in 23 languages and 146 dialects.

Doordarshan was launched on 15 September, 1959 as a part of Prasar Bharti with the motto Satyam Shivam Sundaram. It provides television, radio, online and mobile services throughout metropolitan and regional India with more than 60 channels which broadcast programmes in almost all regional languages along with Hindi and English. It has also a wide spread network in the overseas also.

Reuters is an English news service opened in London by Julius Reuter in 1851, and now the most important institution of its kind in the British Empire. It has correspondents in all the great news centres of the world and furnishes telegraph and other news features throughout the eastern hemisphere and, to some extent, to Latin America, the United States and Canada.

A F P Agence France-Presse (AFP) is an international news agency. The head-quarter of AFP is located in Paris. It was founded in 1944. It is the third largest in the world (after Associated Press and Reuters). AFP has regional offices in Nicosia, Montevideo, Hong Kong, and Washington, D.C., and bureaus in 150 countries. It transmits news in French, English, Arabic, Portuguese, Spanishand German.

AP (Associated Press) is one of the largest and most trusted sources of independent newsgathering. It is neither privately owned nor government-funded; instead, as a not-for-profit news cooperative owned by its American newspaper and broadcast members. Founded in 1846, AP has covered all the major news events of the past 165 years, providing high-quality, informed reporting of everything from wars and elections to championship games and royal weddings.Since the Pulitzer Prize was established, in 1917, AP has received 51 Pulitzers, including 31 photo Pulitzers.AP headquartered in New York, operates in more than 280 locations worldwide.

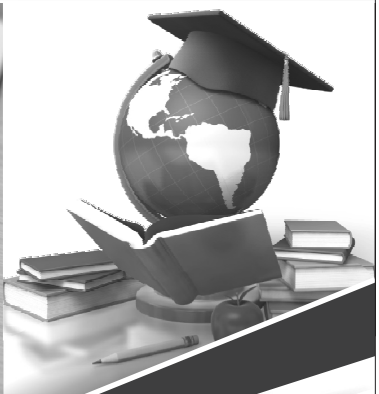
BBC (The British Broadcasting) Corporation is the public service broadcaster of the United Kingdom, head-quartered at Broadcasting House in London. It is the world's oldest national broadcasting organisation and the largest broadcaster in the world. The BBC is established under a Royal Charter and operates under its Agreement with the Secretary of State for Culture, Media and Sport. The history goes back to June 1920 when Britain's first live public broadcast from the Marconi factory in Chelms ford took place.

Al Jazeera It is a Doha-based state funded broadcaster owned by the Al Jazeera Media Network, Partly funded by the house of Thani, the ruling family of Qatar. It is one of the largest news organizations with 80 bureaus around the world. The channel was launched on 1st November 1996 following the closure of the BBC's Arabic language telivision station. Hamid bin Thamer Al thani is the chairman of the channel.









EDUCATION AND CAREER

UPSC

Union Public Service Commission (UPSC) is one of the many constitutional bodies in India. It is authorized to conduct competitive examinations and interviews for recruitment of civil services, defence services and posts under the Union Government or Central Government.

Some of the most sought after exams are as follows:

- Civil Services Examination
- Indian Forest Service examination
- Engineering Services Examination
- Combined Defence Services Examination
- National Defence Academy Examination
- Combined Medical Services Examination

Civil Services Examination

It is conducted by the UPSC. Top services offered by this examination are: IAS (Indian Administrative Service), IPS (Indian Police Service), IFS (Indian Foreign Service), IRS (Indian Revenue Service), Indian Customs and Central Excise Service etc. There are total twenty-four services offered through this single examination. Considering the importance and the nature of the jobs, UPSC takes utmost care in selecting the right people. A three level examination is conducted to achieve this purpose which include Preliminary Examination (Objective-type questions), Main Examination (Descriptive-type questions), and interview test.

Indian Forest Service Examination

IFS officers are recruited through the IFS examination conducted annually by the Union Public Service Commission. The examination is open to graduates in any science or engineering discipline and has a three-stage selection process including Preliminary Examination (Objective-type questions), Main Examination (Written and Interview) spanning nearly seven months. The officers while in field postings in their state cadres work for conservation, protection and development of forests and wildlife along with an aim to enhance livelihood opportunities of forest dependent communities of rural and tribal areas.

Engineering Services Examination

Union Public Service Commission (UPSC) conducts Engineering Services Examination as a combined competitive examination for recruitment to the services or posts of Electrical Engineering, Civil Engineering, Mechanical Engineering, and Electronics and Telecommunication Engineering. The exam is conducted for selection of engineers for government's engineering organizations, such as Indian Railway Service of Engineers (IRSE), Central Engineering Service (CES), Military Engineering Services (MES), etc. The entrance comprises of a Written Exam (section I and II) and an Interview.

Combined Defence Services Examination

CDS Exam or Combined Defence Service Examination is an exam conducted twice every year by Union Public Service Commission (UPSC). It is an exam to induct officers into the Indian Defence Forces i.e. the Army and the Air force. The entrance comprises of a Written Exam followed by and Intelligence and Personality Test.

National Defence Academy Examination

This exam is conducted for admission to the Army, Navy and Air Force wings of the NDA and for Indian Naval Academy Course (INAC) by UPSC. It is an exam to induct cadets into the Indian Defence Forces i.e. the Army and the Air force. The candidates Joining Indian Naval Academy would undergo 4 years B.Tech Course and would be given an opportunity to join Executive and Technical Branches of the Navy subject to availability of vacancies. The examination consists of 2 Papers-Mathematics (300 marks) and General Ability Test (600 marks) with objective type questions, inclusive of negative marking for every wrong answer.

Combined Medical Services Examination

The "Combined Medical Services" Examination or the CMS Exam is conducted by the Union Public Service Commission for recruitment as Medical Officer in various organizations such as the Indian Ordnance Factories, Indian Railways functioning under the Government of India. There is an objective-type written examination with two papers of two hours duration, each carrying a maximum of 250 marks. This is followed by a Personality Test carrying 100 marks of candidates who qualify on the results of the written examination.

SSC

Staff Selection Commission (SSC) is an Indian organization to recruit staff for various posts in the various Ministries and Departments of the Government of India and in Subordinate Offices by administering various competitive exams.

Headquartered in Delhi, this commission is an attached office of the Department of Personnel and Training (DoPT) which consists of Chairman, two Members and a Secretary-cum-Controller of Examinations. Besides, there are post of one Director, one Deputy Secretary, two Joint Directors, nine Under Secretaries, four Deputy Directors, one Finance & Budget Officer, one Assistant Director (OL), 24 Section Officers and more than 183 supporting officers / staff working at the Headquarters for discharging the duties and responsibilities of the Commission.

SSC (like UPSC) is an organization entrusted with the task of conducting examinations and/or interviews, whenever required for recruitment people for government jobs at subordinate (Non-Gazetted) levels. The examinations which are conducted under the purview off SSC are broadly categorized as:

1. Open Examinations
2. Departmental Examinations

OPEN EXAMINATION

S. No.	Name of the Examinations
1	Combined Graduate Level Examination
2	Tax Assistant Examination
3	Statistical Investigators (SSS) Grade IV Examination
4	Junior Engineers(Civil and Elect) Examination
5	Junior Translators (CSOLS) Examination
6	Section Officer (Commercial Audit) Examination
7	Deputy Field Officer (Cab Sect) Examination
8	Data Entry Operator (DEO) Examination
9	Sub Inspector in CPOs Examination
10	Section Officer (Audit) Examination
11	Combined Matric Level Examination
12	Section Officer (Accounts) Examination

DEPARTMENTAL EXAMINATIONS

S. No.	Name of the Examinations
1	Grade 'C' Stenographers Ltd. Depttl. Compt. Examination
2	UD Grade Ltd. Depttl. Compt. Examination
3	Clerks Grade (For Group 'D' Staff only) Examination

Career options after choosing SSC or its branches

Ever since its inception in November 1975, the Staff Selection Commission recruits Indians to Group B governmental posts, Group C technical posts, and more. SSC has announced the prospective job vacancies open for suitable candidates in 2015. Indian citizens have the option to apply for 62,390 job vacancies across governmental organizations like:

- Assistants, in CSS, AFHQ, MEA etc, Inspectors in Central Excise/ Preventive Officer/Income Tax, Inspector of Posts, Sub Inspector in CBI, Divisional Accountants, Auditors, UDC etc
- Tax Assistant in CBDT and CBEC
- Statistical Investigators (SSS) Grade IV in Dept. of Statistics
- Junior Engineers (Civil and Elect) in CPWD/Dept. of Posts, Military Engineering Service
- Junior Translators of CSOLS Cadre in DOL
- Section Officer (Commercial Audit)
- Deputy Field Officer (Cabinet Sect)
- Data Entry Operator (DEO)
- Sub Inspector in CPOs
- Section Officer (Audit)
- Steno Grade "C", Steno Grade "D", and LDC
- Section Officer (Accounts)

BANKING

IBPS PO & Clerk

Candidates aspiring for a Probationary Officer (PO) and Clerk in any Indian Public Sector banks have to go through the compulsory IBPS exams. Recruitment under the IBPS includes a three-tier process consisting of a Preliminary exam of 100 marks of 60 minutes duration, followed by a mains exam of 200 marks with duration of 120 minutes for the shortlisted candidates and finally the third tier is an Interview.

SBI PO & CLERK

State Bank of India (SBI) accepts application form through offline or online for recruitment of Probationary Officer (PO). Candidates who have completed their graduation or above qualification from any recognized university are eligible to apply. The selection of the candidates is done in three phases which include Preliminary Examination, Main Examination, and Group Discussion and Interview.

The SBI Clerks selection is based on an online objective test consisting of General English, General Awareness, Quantitative Aptitude, Reasoning Ability, and Marketing Aptitude/ Computer Knowledge. Each of the sections carries 40 marks, which makes it a total of 200 marks and the candidates have to complete the test within a span of 2 hours and 15 minutes.

VARIOUS INTERNATIONAL TESTS

	SAT	GRE	GMAT	IELTS	TOEFL
Reason to take the test	Used by most U.S. colleges to determine whether students should be accepted into the institution's undergraduate programs.	Used as a judging parameter by most U.S. colleges to determine admissions to master's and doctoral degree programs.	Required for admissions in graduate management programs of most business schools.	An international test of English language Proficiency for non-native English language speakers for higher education and immigration.	Required for testing the English language proficiency of non-native English speakers wishing to enrol in American universities.
Structure of the test	The SAT consists of a 70 minutes Critical Reading section (one 20-min section and two 25-min sections); a 70 minutes Math section (one 20-min section and two 25-min sections) and a 60 minutes Writing section (one 25-min essay, one 25-min section, and one 10-min section)	The GRE consists of Analytical Writing section (1 hour), Verbal Reasoning section (20 questions in 30 minutes) and 2 sections of Quantitative Reasoning (20 questions in 35 minutes)	The GMAT consists of analytical writing assessment (30 min), integrated reasoning (30 min for 12 questions), the quantitative section (75 min for 37 questions), and the verbal section (75 min for 41 questions)	The IELTS test has four sections Listening (30 minutes plus 10 minutes' transfer time), Reading (60 minutes), Writing (60 minutes) and Speaking (11–14 minutes)	Has internet based test and paper based test. The internet based test has reading (60–100 min), listening (60–90 min), speaking (20 min) and writing (50 min). And the paper based test Listening (30 – 40 min), Structure and Written Expression (25 min), Reading Comprehension (55 min) and Writing (30 min).
Format	It is a paper-based standardized test.	The test is a Computer-based or paper-based standardized test.	The GMAT is a computer-based standardized test.	The test involves 2 modules of the IELTS: the Academic Module and the General Training Module.	The TOEFL is either Internet-based or paper-based standardized test.

Scoring	200–800 (in 10-point increments) on each of three sections (total 600–2400). Essay scored on scale of 0–12, in 1-point increments.	Analytical writing scored from 0.0 to 6.0 (in 0.5 point increments), Verbal reasoning and Quantitative reasoning marked on the scale of 130 to 170 (in 1 point increments) each.	The total score ranges from 200 to 800 and Scores are given in increments of 10.	The test is scored on a nine-band scale, with each band equivalent to a specified competence in English.	The iBT test is scored on a scale of 0 to 120 points whereas the PBT score ranges between 310 and 677 and is based Listening (31–68), Structure (31–68), and Reading (31–67).
Test duration	3 hours and 45 minutes	Around 3 hours and 45 minutes	3.5 hours	2 hours, 45 minutes	Internet-based test: 3 hours 10 minutes to 4 hours 20 minutes Paper-based test: 2 hours 20 minutes to 2 hours 30 minutes.
Validity	5 years	5 years	5 years	2 years	2 years

TOP TEN UNIVERSITIES IN THE WORLD

1.	Massachusetts Institute of Technology (MIT)	USA
2.	University of Cambridge	UK
3.	Imperial College London	UK
4.	Harvard University	USA
5.	University of Oxford	UK
6.	UGL (University College London)	UK
7.	Stanford University	USA
8.	California Institute of Technology (Caltech)	USA
9.	Princeton University	USA
10.	Yale University	USA

CAREER OPTIONS

Management
MBA, Brand management, Hotel Management, Corporate communication, customer relationship management, Disaster Management, Event Management, Finanace management, Hospital management, HR, Foreign trade, Investment management, Library mangement, Logistics management, Museology - Museium management, Purchase management, Quality Assurance management, Real estate management, Retail management, Rheumatology, Rural management, Scurities analyst, Sports management, Telemarketing

Medical
MBBS, BDS, BAMS, Anesthesiology, Aromatherapy, Ayurveda, Cardiology, Clinical research, Dermatology, Epidemiology, Gastroentology, Gynecology, Hydro therapy, Magnetic therapy, Medical transcription, Music therapy, Naturopathy, Nephrology, Neurology, Nursing, Nutrition and Dietics, Occupational therapy, Optometry, Osteopathy, ENT, Pediatrics, Physiotherapy, Psychiatry, Psychology, Radiography, Reflexology, Veterinary science
Other Science Courses
BSc, BSc - Bio technology, BSc - Micro biology, BSc- Criminology, BSc- Genetics, BSc. - Nursing, BSc. - Information technology, Agriculture Sciense, Anthropology, Archaelogy, Astronomy, Biochemistry, Bioinformatics, Biophysics, Biotechnology, Botany, cartography, criminology, Entomology, Environmental science, Fishery science, Floriculture, Forestry/ wildlife, Fragrance chemists/perfumers, Geophysics, Gerontology, Home science, Horticulture, Marine biology, Microbiology, Oceanography, Poleontology (study of fossils), Photonics, Political science, Sericulture, Speech pathology and audilogy, Toxicology, Cosmetology, Behavioural science
Engineering
Aeronautical Engineering, Agriculture Engineering, Animation, Automobile Engeenering, Biomedical engineering, Broadcast Engineering, Architecture, Chemical, Civil, Cloud computing, CAD, Computer, Computer system analyst, Dairy technology, Electrical, Electronics, Environmental engineering, Ethical hacking, Fire engineering, Food technololgy, Footwear technology, Gaming industry, Gemology, Genetic engineering, Graphic Designing, Industrial Engineering, Instrumentation Engineering, Leather Technology, Marine engineering, Mechanical engineering, Mechatronics engineering, Medical laboratory technology, Mining engineering, Nanotechnology, Nuclear engineering, Ocean engineering, Paint technology, Petroleum engineering, Pharmaceutical technology / engineering, Polymer/ plastic engineering, Robotics engineering, Rotoscoping, Strutural engineering, Surgical technology, Telecommunication engineering, Textile technology, Thermal engineering, Transportation engineering, VLSI/chip designing, Web designing
Accountancy/Economics
Agriculture Economics, Auditing, Issurance, CS, Banking, CA
Sports
Adventure Sports, Fitness trainer, Coach
Arts
Dance, Music, DJ, Fashion choregraphy, Interior desigining, Jewellery designing, Makeup artist, Photography, Photojournalism, Radio jockey, Video jockey
Food/ Catering
Chef, Chocolatier, Food critic, Oenology,
Education and training
Corporate training, Counselling, Creative writing, Foreign language, Lexicography
Other Professions
Adventure Tourism, Mass Communication, Advertising, Air Hostess, Fashion Designing, Anchoring, Modelling, Cinematography, Film making, Commercial pilot, Detectives/private investigators, Merchant navy
Defence
Chief of Army Staff, Flying Branch, Technical Branch, Ground duty branch, Pilot, Air traffic Controller, Logistic Cadre, Adjutant General, Quarter Master General, Master General of Ordnance, Military Secretary, Engineer- in-Chief

MOST SOUGHT-AFTER COURSES

Engineering

Premier institutions: The Indian Institutes of Technology (IITs), Birla Institute of Technology & Science (BITS), Indian Institutes of Information Technology (IIITs), National Institutes of Technology (NIT) and many more.

Major Branches of Engineering:

Mechanical Engineering: The branch applies the principles of engineering, physics and material science for the design, analysis, manufacturing and maintenance of mechanical systems.

***Eligibility*:** Aspirants must have appeared in the 10+2 with Physics, Chemistry and Mathematics as core subjects.

***Course Duration*:** 4 years for B.E or B.Tech in Mechanical Engineering.

Computer Science Engineering: Computer Science engineering deals with design, implementation, and management of information system of both software & hardware processes. A computer engineer specializes in theory of computation and design of computational systems.

***Eligibility*:** Must have appeared in the 10+2 with Physics, Chemistry and Mathematics as core subjects.

***Course Duration*:** 4 years for B.E or B.Tech in Computer Science engineering.

Electronics and Communication Engineering: This branch of engineering develops everyday devices such as transistors, integrated circuits and printed circuit boards (PCBs) which can be used in computers, MP3 players, cell phones, television to name a few.

***Eligibility*:** Must have appeared in the 10+2 with Physics, Chemistry and Mathematics as core subjects.

***Course Duration*:** 4 years for B.E or B. Tech in Electronics and Communication Engineering.

Electrical Engineering: Electrical Engineering deals with the study and application of electricity, electronics, and electromagnetism. The focus of the course remains on designing and testing ICs, inductors, capacitors and resistors.

***Eligibility*:** Must have appeared in the 10+2 with Physics, Chemistry and Mathematics as core subjects.

***Course Duration*:** 4 years for B.E or B.Tech in Electrical Engineering.

Civil Engineering: The discipline of Civil Engineering deals with the various aspects of planning, designing, construction, maintenance and modification of physical structure and naturally built environment.

***Eligibility*:** Should have passed 10+2 from a recognized board with Science-Mathematics, Physics and Chemistry with 50 percent.

***Course Duration*:** 4 years for B.E or B.Tech in Civil Engineering.

Information Technology: Information Technology is the study of utilizing computers and telecommunications in order to control, gather, store and circulate information.

Eligibility: Should have passed 10+2 from a recognized board with Science- Mathematics, Physics and Chemistry with 50 percent.

Course Duration: 4 years for B.E or B.Tech in Information Technology.

Aeronautical Engineering: Aeronautical engineering is the specialized branch of engineering for the aviation industry. It involves studying, designing, construction and science of the airplanes and other spacecraft.

Eligibility: Should have passed 10+2 from a recognized board with Science- Mathematics, Physics and Chemistry with 50 percent.

Course Duration: 4 years for B.Tech in Aeronautical Engineering.

Architecture Engineering: Architecture Engineering is the area of study, which deals with the designing, and planning of buildings and structures and the spaces between them.

***Eligibility*:** Should have passed 10+2 from a recognized board with Science- Mathematics, Physics and Chemistry with 50 percent.

***Course Duration*:** 5-year Bachelor of Architecture degree programme.

Chemical Engineering: Chemical Engineering is concerned with the design, construction, and operation of machines and plants that perform chemical reactions to solve practical problems or make useful products. It deals with the application of physical science and life sciences with mathematic, to the process of converting raw materials or chemicals into more useful or valuable forms.

***Eligibility*:** Should have passed 10+2 from a recognized board with Science- Mathematics, Physics and Chemistry with 50 percent.

***Course Duration*:** 4 years for B.Tech in Chemical Engineering.

Medical

Premier institutions: All India Institute of Medical Sciences (AIIMS), Delhi, Armed Forces Medical College (AFMC), Pune, Christian Medical College (CMC), Vellore, Maulana Azad Medical College (MAMC), Delhi, (JIPMER) Jawaharlal Institute of Postgraduate Medical Education & Research, Pondicherry, and many more.

Major courses of Medical:

M.B.B.S: MBBS (Bachelor of Medicine and Bachelor of Surgery) is the bachelor degree in medical field for cure & diagnose.

Eligibility: Should have secured 50% marks in physics, chemistry, biology and English in the '10+2' examinations.

***Course Duration*:** The course duration is 5½ years (4½ years of classroom study followed by a year of rotating internship)

B.D.S : The BDS (Bachelor of Dental Surgery) is the only educational and professional programme of dental surgery in India.

***Eligibility* :** Candidates should have passed the 10+2 examination with Physics, Chemistry, Biology and English.

***Course duration*:** The BDS is a 5 year (4 years academic education + 1 year mandatory internship) UG degree programme.

B.H.M.S: BHMS (Bachelor of Homeopathic Medicine and Surgery) is an undergraduate degree programme in medical field. This degree covers the medical knowledge of the homeopathic system.

Eligibility: Students should have passed 10+2 examination with physics, chemistry and biology.

***Course Duration*:** 5.5 years academic programme containing the 4 and 1/2 year academic session and one year internship programme.

B.A.M.S: Bachelor of Ayurvedic Medicine and Surgery (BAMS) is an integrated Indian Degree in the medical field. This degree programme is conferred to those students who studied the modern medicines and traditional Ayurveda.

Eligibility: Should have passed 10+2 examination with physics, chemistry and biology.

***Course Duration*:** 5 years and 6 month degree programme containing the 4 and 1/2 year academic session and one year internship programme.

B. Pharma: Bachelor of Pharmacy or B.Pharma is an undergraduate degree course in Pharmacy. After the completion of this degree, the students can practise as a Pharmacist.

***Eligibility*:** Must have passed 10+2 with Physics, Chemistry, Mathematics or Biology and must have scored minimum of 50% marks.

***Course Duration*:** This duration of this course is 4 years.

M.D: M.D (Doctor of Medicine) is awarded to the doctors who are physicians.

***Eligibility*:** The minimum eligibility for this course is MBBS.

***Course Duration*:** 3 years

M.S: This degree is awarded to the doctors who master course in surgery.

***Eligibility*:** The minimum eligibility for this course is MBBS.

***Course Duration*:** 3 years

Mass Communication

Premier Institutions : Symbiosis Institute of Media & Communication (Pune); Amity School of Communication (Noida); Delhi College of Arts & Commerce; Manipal Institute of Communications; Department of Media Studies, Christ University (Bangalore); St. Xavier's College (Mumbai); Institute of Mass Communication Media Technology (Kurukshetra) and many more.

Main Branches of Mass Communication

Bachelor of Journalism and Mass Communication (BJMC): Bachelor's programs in journalism and mass communication combine classes in journalism, writing and communications. Students must complete both a broad liberal arts education and rigorous writing course work.

***Eligibility*:** Pass with 50% aggregate marks in 10+2 or equivalent (with English)

***Course Duration*:** 3 years

Master of Journalism and Mass Communication (MJMC):

It is an academically-oriented degree that prepares students for doctoral studies or a career in research.

***Eligibility*:** Graduation.

***Course Duration*:** 2 years

Law

Premier Institutions: National Law School of India University (Bangalore); National Academy of Legal Studies and Research (Hyderabad); National Law University (Delhi); Faculty Of Law, BHU; Faculty of Law, Aligarh Muslim University; University School of Law & Legal Studies, GGSIPU and many more.

Major courses of Law:

LLB (Bachelor of Law): It is an undergraduate law course. The degree felicitates a student to become a lawyer or work in a legal department.

***Eligibility*:** Graduate or equivalent

***Course of Duration*:** 3 years

LLM (Masters in Law): The University Grants Commission approved one-year LLM courses in India on 6 September 2012 and the guideline for the same was notified in January, 2013.

***Eligibility*:** Should have cleared LL.B./ Five-Year Integrated LL.B./any other equivalent examination with minimum 55% marks for General/OBC/PWD categories and minimum 50% marks for SC/ST categories

***Course of Duration*:** 2 years

Business & Management

Premier Institutions: Christ University; Symbiosis Centre for Management Studies; Amity International Business School; Indian Institutes of Management (IIMs); XLRI (Xavier Labour Relations Institute) Jamshedpur; FMS (Faculty of Management Studies) Delhi; JBIMS (Jamnalal Bajaj Institute of Management Studies) Mumbai.

Major courses of Business & Management

Bachelor of Business Administration (BBA) : It is a bachelor's degree in commerce and business administration.

***Eligibility*:** Should have passed 10+2 with at least 50% marks.

***Course Duration*:** 3 years

Master of Business Administration (MBA): It is a master's degree in business administration (management).

***Eligibility*:** The minimum eligibility criterion for admission is at least a 3-year bachelor's degree with at least 50 per cent marks or equivalent.

***Course Duration*:** 2 years

The following are the list of some of the specialization in MBA Courses in India:

- Finance
- Marketing
- Human Recourse (HR)
- International Business (IB)
- Health Care Management
- Operations
- Banking and Finance
- Sales and Marketing

Hotel Management

Premier Institutions: Institutes of Hotel Management (IHM), Oberoi Centre of Learning and Development, Welcomgroup Graduate School of Hotel Administration (WGSHA) Manipal, Christ College Bangalore.

Major courses of Hotel Management

Bachelor of Hotel Management (BHM)

***Eligibility*:** The candidate should have passed 10+2 stage examination

***Course duration*:** 3 years

Bachelor of Science in Hotel Management: The program teaches students the necessary technical, organizational, and communication skills needed to manage restaurants, hotels, and other places where hospitality is essential to the nature of the business.

***Eligibility*:** Must have passed Class 10+2 examination with at least 50% marks.

***Course Duration*:** 4 years

TOP TEN EDUCATIONAL INSTITUTIONS IN INDIA

1.	Indian Institute of Technology Delhi (IITD)
2.	Indian Institute of Technology Bombay (IITB)
3.	Indian Institute of Technology Kanpur (IITK)
4.	Indian Institute of Technology, Madras (IITM)
5.	Indian Institute of Technology Karagpur
6.	Indian Institute of Technology Roorkee (IITR)
7.	University of Delhi
8.	Indian Institute of Technology Guwahati (IITG)
9.	University of Calcutta
10.	University of Mumbai

UNIVERSITY GRANTS COMMISSION

The University Grants Commission (UGC) is a constitutional organization established in 1956 by an Act of Parliament. It provides grants to eligible universities and colleges, and also advises the Central and State Governments on the measures which are necessary for the development of Higher Education. Its headquarters is situated in New Delhi and the other six Regional offices are located in Bangalore, Bhopal, Guwahati,

Hyderabad, Kolkata and Pune. Indian government has set a National Institutional of Ranking Framework under UGC which will rank all educational institutes by April 2016. Prof. Ved Prakash is the incumbent Chairman of UGC. The commission along with CSIR conducts NET for appointments of teachers in colleges and universities. It has made NET qualification mandatory for teaching at Graduation level and at Post Graduation level since July 2009.

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION (AICTE)

The All India Council for Technical Education (AICTE) is the statutory body and a national-level council for technical education, under Department of Higher Education, Ministry of Human Resource Development. The council was established in November 1945 as an advisory body but 1987 was given statutory status by an Act of Parliament. It is responsible for proper planning and coordinated development of the technical education and management education system in India. The AICTE accredits postgraduate and graduate programs under specific categories at Indian institutions as per its charter.

What is a deemed university?
Deemed university, or "Deemed-to-be-University", is a status of autonomy granted by the Department of Higher Education in the Union Human Resource Development Ministry, on the advice of the UGC, under Section 3 of UGC Act, 1956. The status allows full autonomy in courses, syllabus, admissions and fees. The first institute to be granted deemed university status was Indian Institute of Science which was granted this status on 12th May 1958.

CENTRAL BOARD OF SECONDARY EDUCATION (C.B.S.E)

The Central Board of Secondary Education (CBSE) is a Board of Education for public and private schools which functions under the under supervision of the Union Government of India. CBSE affiliates Kendriya Vidyalayas, Jawahar Navodaya Vidyalayas, private schools and most of the schools approved by central government of India. It conducts 10th and 12th boards every year in the month of March. It also conducts AIPMT (All India Pre Medical Test) for admission to major medical colleges in India. In 2014, the conduct of the National Eligibility Test for grant of junior research fellowship and eligibility for assistant professor in institutions of higher learning was outsourced to CBSE. With the addition of NET in 2014, the CBSE has become the largest exam conducting body in the world. Vineet Joshi is the current chairman of the board.

COUNCIL FOR THE INDIAN SCHOOL CERTIFICATE EXAMINATIONS (CISCE)

Council for the Indian School Certificate Examinations (CISCE) is a national level, private, Board of School education in India which conducts the Indian Certificate of Secondary Education and the Indian School Certificate examinations for 10th and 12th standard respectively. The board was established in 1958.





INFORMATION TECHNOLOGY & COMPUTERS

INFORMATION TECHNOLOGY

Information technology is playing vital role in India today and has transformed India's image from a slow moving bureaucratic economy to a land of innovative entrepreneurs.

The IT sector in India is generating 2.5 million direct employment. India is now one of the biggest IT capitals of the modern world. Information technology in India is an industry consisting of two major components:

a. IT services

b. Business process outsourcing (BPO).

The IT sector has increased its contribution to India's GDP from 1.2% in 1998 to 9.5% in 2015.

According to NASSCOM (The National Association of Software and Services Companies) is a trade association of Indian Information Technology (IT) and Business Process Outsourcing (BPO) industry), the sector aggregated revenues of US$147 billion in 2015, where export revenue stood at US$99 billion and domestic at US$48 billion, growing by over 13%.

Indian Government Initiatives

Some of the major initiatives taken by the government to promote IT and ITeS sector in India are as follows:

1. The Government of India has launched the Digital India programme to provide several government services to the people using IT and to integrate the government departments and the people of India. The adoption of key technologies across sectors spurred by the 'Digital India Initiative' could help boost India's gross domestic product (GDP) by US$ 550 billion to US$ 1 trillion by 2025, as per research sources. India and the United States (US) have agreed to jointly explore opportunities for collaboration on implementing India's ambitious Rs 1.13 trillion (US$ 18.22 billion) 'Digital India Initiative'.

What is Digital India Programme?
Digital India is an initiative of Government of India to make the government services available to citizens of India electronically. It is to be done by improving the web services and internet connectivity all over India. The programme was launched on July 1, 2015 by Prime Minister Narendra Modi. The core components of the initiative are to create digital infrastructure, digital literacy and delivery of services digitally. DigiLocker is another feature of the programme through which Indian citizens will be able to digitally keep in reserve their important documents like passport, mark sheets, certificates and Election card and Aadhaar Card. These electronic documents safe has been introduced to avoid the hassle of submitting the documents physically with government agencies. The other features of Digital India also include the Swachh Bharat Mission (SBM) Mobile app that will enable people and Government organisations to achieve goals of SBM. eSign framework is a feature that would enable nationals to digitally sign documents only by making use of Aadhar authentication. E-Hospital system is yet another important feature that would enable online registration, fee payment, fixing appointments, checking blood availability and medical reports for the users. It is a wholesome package to connect citizens with many services without having to avail them physically.

Digital India
Power To Empower

2. Human Resource Development Ministry has launched the National Web Portal for promotion of National Apprenticeship Scheme for graduates, diploma holders and 10+2 pass-outs vocational certificate holders, with a view to bridge the gap between the students and the industry.
3. The Government of Telangana has begun construction of a technology incubator in Hyderabad—dubbed T-Hub—to make the city as a technology destination. The state government is initially investing ₹ 35 crore (US$ 5.3 million) to set up a 60,000 sq ft space, labelled the largest start-up incubator in the county, at the campus of International Institute of Information Technology-Hyderabad (IIIT-H). Once completed, the project is proposed to be the world's biggest start-up incubator housing 1,000 start-ups.

Supercomputing in India

India's supercomputer programme was started in late 1980s. PARAM 8000 is considered India's first supercomputer. It was indigenously built in 1990 by Centre for Development of Advanced Computing and was replicated and installed at ICAD Moscow in 1991 under Russian collaboration.

Supercomputers of India:

- **Aaditya:** It is used for climate research and operational forecasting. It ranks 96th among the world's top 500 supercomputers.
- **Anupam:** Anupam is a series of supercomputers designed and developed by Bhabha Atomic Research Centre (BARC) for their internal use. It is mainly used for molecular dynamical simulations, reactor physics, theoretical physics, computational chemistry, computational fluid dynamics, and finite element analysis. The latest in the series is Anupam-Aagra clocked at 150 TFlops.
- **PARAM Yuva II:** Unveiled on 8 February, 2013, this supercomputer was made by Centre for Development of Advanced Computing and will be used for research in space, bioinformatics, weather forecasting, seismic data analysis, aeronautical engineering, scientific data processing and pharmaceutical development. Educational institutes like the Indian Institutes of Technology and National Institutes of Technology can be linked to the computer through the national knowledge network. This computer is a stepping stone towards building the future petaflop-range supercomputers in India. It ranks 174th among the world's top 500 supercomputers.

IT Trends

(a) Internet.org

Social networking services company Facebook along with Samsung, Ericsson, MediaTek, Opera Software, Nokia and Qualcomm have moved into a partnership which is named as Internet.org. This coming together of companies is to attain the objective of bringing affordable access to selected services of Internet in countries.

Internet.org was launched in August 20, 2013 by Mark Zukerberg to improve internet access for people across the world. In May 2015, it was announced that Internet.org users would be able to use third-party apps soon. The platform would be made available to all developers to have their apps on the portal subject to fulfilling the technical criteria like websites requiring high-bandwidth will be excluded, partner services should be optimized for smart phones and services should promote the exploration of broader internet wherever possible. The first summit of Internet.org was held in New Delhi, India on October 9, 2014.

Internet.org has launched its Free Basics Android application to offer free web services to its users.

(b) Net Neutrality

Network Neutrality, Internet Neutrality or Net neutrality is a term that was first given by media law professor of Columbia University, Tim Wu, in the year 2003. The principle makes it necessary for the Internet service providers and governments to treat all Internet data as same. There will not be any charges imposed on by user, application, type of enclosure, content, website, etc. It is the best way for all to enjoy the usefulness of internet without any charges. It is a feature of net neutrality to allow different websites to exist side-by-side without affecting others. At the same time and same speed, all the websites are accessible for users. Net neutrality will support competitive market place by providing a chance to each firm irrespective of its size. Net Neutrality has enabled Google, Facebook and Zomato to reach various places around the globe. Until now, India has had no laws to govern the net neutrality. Although Telecom Regulatory Authority of India (TRAI) has released rules for unified access service license to encourage net neutrality, they do not execute them.

Free Basics by facebook is a free step to connecting one billion Indians to jobs, education, and opportunities online, and ultimately a better future.

(c) Windows 10

Windows 10 is a personal computer operating system developed by Microsoft. It has launched new features to facilitate the users. Cortana is a feature that acts as personal assistant for the user by aiding in the easy management of calendar, file finding, chatting, telling jokes and tracking packages. It gives a complete personalized experience to the user. Office app is of two types for desktop and mobile. The desktop office app enables the users to enjoy advanced features of the traditional programmes. Office mobile app are deigned to work in both mobiles and tablets. Microsoft Edge on Windows 10 allows users to surf the web. It has the feature of Hub that stores all the stuff the user collects on the web and when the user signs in with a Microsoft account, all favourites, browsing history, current downloads and reading lists are available across the Windows 10 devices the user has. Xbox offers games streaming from Xbox. Another appealing feature is Continuum that allows optimization of the look and behaviour of apps according to users' preferences.

Mobile Trends

(a) 4G

Fourth generation, also called as 4G, is the succeeding generation of 3G in mobile telecommunications. It is an advanced system with advanced capabilities of telephony, mobile web, gaming services, high definition TV, video conferencing, 3D television and cloud computing. It is faster and has better features than its successor 3G.

Mobile generations began in 1981 with analogue (1G) moving to digital transmission (2G) in the year 1992. Then, in 2001, multi-media supported 3G was introduced. It had peak bite rate of 200 kb/s. 4G is assumed to have a five times faster speed than its predecessor 3G. 4G aims at providing a download speed of 100MB/s.

(b) Android M

Android M is the code name of Android 6.0 Marshmallow, a version of Android mobile operating system. It was first unveiled in May 2015 and officially released in October 2015. It offers to improve user experience of Lollipop. The system has a new "Assist" API that allows sending a screenshot of the application to the assistant application for analysis.

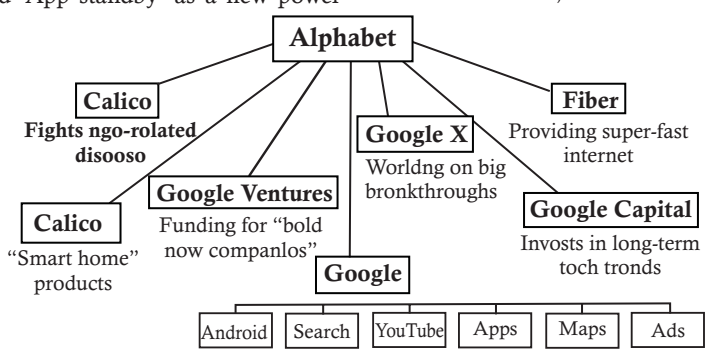
It has an application 'Google Now on Tap' that allows user to search Google in one step.

This version of android has a different application permission model like applications do not automatically take permissions in one click at the time of installation. Users can now grant or deny individual permissions while installing an application.

Marshmallow has introduced 'Doze' and 'App standby' as a new power management system. Doze is a brainy battery manager that identifies when your mobile is not in use and enters hibernation to save power. Android Marshmallow takes about 3-5 per cent of battery life overnight as compared to other devices that lose about 15-25 per cent. App Standby is yet another feature that identifies and disables them when found not in use for a while. It has also a fingerprint recognition procedure that is necessary for allowing third-party application installation.

Alphabet Inc.: At a glance

American search engine company, founded in 1998 by Sergey Brin and Larry Page that is a subsidiary of the holding company Alphabet Inc. More than 70 per cent of worldwide online search requests are handled by Google, placing it at the heart of most Internet users' experience. Its headquarters are in Mountain View, California.



Calico: Calico is a research and development company whose mission is to harness advanced technologies to increase our understanding of the biology that controls lifespan.

Google X: Google X is a semi-secret research and development facility created by Google and operated as a subsidiary of Alphabet. Google Life Sciences, a former division of Google X became a direct independent subsidiary of Alphabet.

Project Loon: Project Loon is a research and development project. It is developed by Google X with the mission of providing Internet access to rural and remote areas. The project uses high-altitude balloons placed in the stratosphere at an altitude of about 18 km (11 mi) to create an aerial wireless network with up to 4G-LTE speeds.

Google Ventures: GV is the venture capital investment arm of Alphabet Inc. It provides seed, venture, and growth stage funding to technology companies. The firm operates independently from Google and makes financially driven investment decisions. GV seeks to invest in startup companies in a variety of fields ranging from Internet, software, and hardware to life science, healthcare, artificial intelligence, transportation, cyber security and agriculture.

Google Capital: It is the late-stage growth venture capital fund financed by Google. It was founded in 2013. It focuses on larger, growth stage technology companies, and invests for profit rather than strategically for Google. Google Capital's approach includes giving portfolio companies access to Google's people, knowledge, and culture to support the companies' growth and offer them guidance. This includes connecting them with a roster of advisors.

Nest Labs: A Subsidiary of alphabet this is a home automation producer of programmable, self-learning, sensor-driven, Wi-Fi-enabled thermostats, smoke detectors, and other security systems. It introduced the Nest Learning Thermostat in 2011 as its first product. The Nest Protect smoke and carbon monoxide detector was then introduced in October 2013. Nest Cam was introduced in June 2015.

Google Apps and Chrome: In 2006, in what many in the industry considered the opening salvo in a war with Microsoft, Google introduced Google Apps—application software hosted by Google that runs through users' Web browsers. The first free programmes included Google Calendar (a scheduling programme), Google Talk (an instant messaging programme), and Google Page Creator (a Web-page-creation programme). In order to use these free programmes, users viewed advertisements and stored their data on Google's equipment. This type of deployment, in which both the data and the programs are located somewhere on the Internet, is often called **cloud computing**. In 2008 Google released Chrome, a Web browser with an advanced JavaScript engine better suited for running programmes within the browser.

Android Operating System: Android is the operating system that powers more than one billion smart phones and tablets. Since these devices make our lives so sweet, each Android version is named after a dessert. Whether it's getting directions or even slicing virtual fruit, each Android release makes something new possible. Google's entry into the lucrative mobile operating system market was based on its acquisition in 2005 of Android Inc., which at that time had not released any products. Two years later Google announced the founding of the Open Handset Alliance, a consortium of dozens of technology and mobile telephone companies, including Intel Corporation, Motorola, Inc., NVIDIA Corporation, Texas Instruments Incorporated, LG Electronics, Inc., Samsung Electronics, Sprint Nextel Corporation, and T-Mobile (Deutsche Telekom).

Google Earth: In 2004 Google bought Keyhole Inc., which was partially funded by the Central Intelligence Agency's venture capital arm, In-Q-Tel. Keyhole had developed an online mapping service that Google rebranded in 2005 as Google Earth. This service let users find detailed satellite images of most locations on Earth and also create combinations (known as "mashups") with various other databases, incorporating details such as street names, weather patterns, crime statistics, coffee shop locations, real-estate prices, and population densities into maps created by Google Earth.





TECHNOLOGY

TOP TECHNOLOGICAL INNOVATIONS

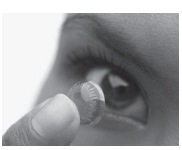
Biotech & Medical Breakthroughs

Tissue Engineering: Tissue engineering is a field that applies the principles and methods of bioengineering and life sciences that will restore, maintain, and improve tissue. Current approaches of tissue engineering are undergoing on organ transplantation on much emphasis on the application of stem cells.

Gene Editing: Gene editing is a tool for the CRISPRs (Clustered Regularly Interspaced Short Palindromic Repeats) which are the segment of prokaryotic DNA containing short repetitions of base sequences. Genome editing techniques were concurrent with other approaches over the years to manipulate gene function, including homologous recombination and RNA interference.

Cancer Spit Test: Forget biopsies—a device designed by researchers at the University of California-Los Angeles detects oral cancer from a single drop of saliva.

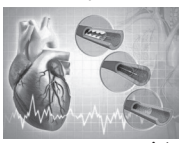
Smart Contact Lens: Contact lenses developed at the University of California-Davis contain conductive wires that continuously monitor pressure and fluid flow within the eyes of at-risk people. The lenses then relay information to a small device worn by the patient;



the device wirelessly transmits it to a computer.

Speech Restorer: For people who have lost the ability to talk, a new "phonetic speech engine" from Illinois-based Ambient Corporation provides an audible voice. Developed in collaboration with Texas Instruments, the Audeo uses electrodes to detect neuronal signals travelling from brain to vocal cords.

Absorbable Heart Stent: The bio-absorbable version made by Abbott Laboratories in Illinois does its job and disappears. After six months the stent begins to dissolve, and after two years it's completely gone, leaving behind a healthy artery.



Stem cell treatment: Stem cell has been used to treat range of diseases, injuries and other health related conditions. The widely used stem cell treatment is the transplantation of blood stem cells used to treat disease and immune system.

Nanomedicines: Nanomedicine is one of the applications of nanotechnology which is used for diagnosing, treating, and preventing diseases. Nanomedicine shoes, the promising use in disease diagnosis, drug delivery on a targeted site in the body and molecular imaging.

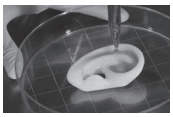
Nanosensors: Today detection of biological and chemical species is the centre of area in the field of health care. Nanosensors are any biological, chemical, or surgical sensory points used to convey information about nanoparticles to the macroscopic world.

Biosensors: Biosensor is a device for the detection of biological component with a physiochemical detector component. Biosensors can convert the biological data to electrical signal which can be later used to detect enzymes, receptors antibodies and microbial cell.

Artificial brain: Artificial brain is a collection of interconnected neural net module which is evolved in a special electronic hardware downloaded into PC and interconnected according to the design of human brain.

Artificial Intelligence: It is the field of science in which we study how computers and computer softwares can be created that are capable of intelligent behaviour.

Bio-printing: 3D bio-printing is the process of creating spatially-controlled cell patterns, in which the behaviour of biological tissues can be reproduced.



PHYSICS DISCOVERIES

Physicists compressed quantum data: If today's classical computers could not compress the information we're constantly sending back and forth, then your Internet connection would have been infinitely slower.

The nuclear fusion reaction that produced more energy than it used up: Scientists at Lawrence Livermore's National Ignition Facility (NIF) brought us one step closer to the cleaner, more economical power of nuclear fusion — by finally making more energy than they used to start the fusion reaction. They compressed a small amount of fuel enough to induce nuclear fusion and they extracted more energy from the fuel than they put in.

Robot for testing the lifetime of human-machine interfaces:

Keypads and touchscreens make a wide range of different devices easy and intuitive to operate. However, the material is subject to especially high loading through constant use and, at some point, becomes impaired in its functionality. A robot system developed by Fraunhofer IPA now allows device manufacturers to realistically simulate such loading in order to determine how durable their devices are.



CHEMISTRY INVENTIONS

Polythene : In 1933 a method for making the plastic was discovered by chemists at, the now defunct chemical company, ICI. ICI turned this serendipitous discovery into a practical method for producing the common plastic that's almost certainly within easy reach of you now.

The Haber-Bosch process : In 1910, German chemists Fritz Haber and Carl Bosch combined atmospheric nitrogen and hydrogen into ammonia. This in turn can be used as crop fertiliser, eventually filtering up the food chain to us.

Penicillin: Alexander Fleming generally gets the credit for penicillin when, in 1928, he observed how a mould growing on his petri dishes suppressed the growth of nearby bacteria. Full-scale production of penicillin started in 1944 by Margaret Hutchinson Rousseau who converted it into a full-scale production plant.

SPACE

Artificial gravity: It is the increase or decrease of apparent gravity (g-force) by artificial means, particularly in space as well as on Earth.

Hyper Telescope: Hyper-telescope is a set of telescopes, arranged in a large lens-shape, working together to resolve astronomical images at much higher angular resolutions than possible with each telescope alone.

Geo-stationary satellite: A geostationary satellite is an earth-orbiting satellite, placed at an altitude of approximately 35,800 kms (22,300 miles) directly over the equator, that revolves in the same direction the earth rotates (west to east).



Polar Orbit: It is an orbit in which a satellite passes above or nearly above both poles of the body being orbited (usually a planet such as the Earth, but possibly another body such as the Sun) on each revolution.

Space shuttle : The primary vehicle for research and exploration is the space shuttle. The space shuttle takes off like a rocket, orbits the earth like a spacecraft and lands, like an aeroplane. It consists of an orbiter, an external tank and two solid rocket boosters.

Artificial Satellites : An artificial satellite is a manufactured 'moon'. It circles the earth in space along a path called an orbit. An artificial satellite may be designed in almost any space. It does not have to be streamlined, because there is little or no air where it travels in space. Artificial satellite may be classified according to the jobs they do as : weather satellites, communications satellites, navigation satellites, scientific satellites and military satellites.

Space Probes : Space probes are used to explore space at various distances from the earth. Four main kinds of probes are :

(i) **Sounding rockets :** It carry instruments into the upper atmosphere and into space near the earth.

(ii) **Lunar Spacecraft :** It explores the moon to prepare the way for astronauts to land there.

(iii) **Interplanetary Probes :** It explore space between the planets. They do not reach a specific body in space.

(iv) **Planetary Probes :** It travel in orbits around the sun. They may fly past the target planet, go into orbit around it, or land.

Orbits : Selecting the orbit is one of the first steps in planning the launch of an earth - orbiting spacecraft. Early manned space craft usually orbited less than 320 Kilometres high. In this way, they avoided the radiation in the Van Allen-belts. A communication satellite may orbit at a much greater distance in order to serve many ground stations.

Remote Sensing : The term 'remote sensing' refers to the process of sensing, identifying and delineating various objects on ground from a distance without coming into direct physical contact with them. ISRO and the Indian Council of Agricultural Research conducted during 1974-75 a joint experiment called the Agricultural Resources Inventory and Survey Experiment (ARISE). Indian experimental satellites, Bhaskara I and II carried out remote sensing for land cover mapping, geology and vegetation cover of the country. Today, India has the largest group of remote sensing satellites providing services at both the national and global levels.

Launch Vehicle Technology :

- **SLV :** The indigenous capability for the development of satellite launch vehicle (SLV), was demonstrated through the first successful launch of SLV-3 in July 1980, carrying the 40-kilogram Rohini satellite.
- **ASLV :** The Augumented Satellite Launch Vehicle (ASLV), basically derived from SLV-3, was originally meant for putting 150 Kilogram class technological/ scientific payloads into near-circular orbit.

- **PSLV :** The PSLV, the country's first operational launch vehicle, is a four-stage rocket. The first stage is a solid propellant, the second stage is based on the liquid engine technology,



the third stage is a solid propellant motor and the fourth, a liquid propellant stage.
- **GSLV :** On March 28, 2001, the ISRO's efforts to launch the geosynchronous satellite launch vehicle ended in failure. On April 18, ISRO managed to prepare the GSLV again and launch it successfully from Sriharikota. The GSLV was commissioned after its successful second flight in 2003.

Cryogenic Engine : The cryogenic engine is crucial to the development of GSLV. Cryogenics refers to technology of sub-zero temperatures, and cryogenic engines use liquid oxygen as the oxidiser and liquid hydrogen as the fuel. India was to acquire the cryogenic engine and technology from the Russian space agency, Glavkosmos.

The advantage of the cryogenic engine is that it would develop one-and-a-half times the thrust of conventional liquid rocket engines using fuel storable at room temperature. It is a high risk high technology and would help bridge the gap between the number of satellite being made by India and the vehicles needed for their launch.

DEFENCE

Ballistic Missiles: Ballistic Missiles are generally used to combat land attacks. These missiles follow a trajectory path with an objective of delivering one or more warheads to a predetermined target. Long range intercontinental ballistic missiles (ICBM) are launched at a steep, sub-orbital flight trajectory and spend most of their flight out of the atmosphere. Shorter range ballistic missiles are restricted only within Earth's Atmosphere. Prithvi missile series and Agni missile series are the example of Indian ballistic missiles.

Cruise Missiles : Cruise Missiles are low flying missiles, which are programmed to target by an on board computer. These missiles are used for long distance warheads with high accuracy. These are self-corrected avionic missiles with high tech aeronautics using transistor and computer technology. BrahMos and Nirbhay missiles of Indian origin are under this category.

Submarine-launched ballistic missiles: are the type of ballistic missiles which can be launched form submarine. They can efficiently strike multiple targets at time using multiple independently targetable reentry vehicle (MIRV). The Indian origin SLBMs, K-15 (aka B0-5) and K-4 are the examples.

INFRASTRUCTURE

Construction robotics startup develops revamping building process: Construction robotics startup Asmbld, based in Brooklynis working on a robotics system that can reconfigure a room in minutesand is called "like 3-D printing upside down." The "Project Dom Indoors" process involves tiny

robots living inside cubes created from 5-inch tiles and aluminium studs that make up the floor of a room. Those cubes can rise out of the floor to create walls, surfaces and tables, and then slide back into their original position in the floor.

Self-driving crash trucks at roadside work zones: A Coopersburg, PA, equipment company launched a self-driving truck which can be used by highway construction crews in Florida. The driverless vehicles will serve as construction-site "crash trucks" — the barrier-surrounded vehicles that lead the roving construction crews that paint highway lines, inspect bridges and pave roads.

Parking lot 'drinks' 1,000 gallons of water in 1 minute: To prevent devastating damage caused by stormwater runoff, a parking lot paved with a product called Topmix Permeable absorbs more than 1,000 gallons of water in a minute.

Robot replaces construction crews: A Japanese construction equipment maker proposed replacing crews with robots as a solution to the labour shortage. Komatsu also introduced a team of driverless, robotic excavation vehicles that are guided by drones, which create a real-time 3-D map of the area to track the work site.

TELECOM

LiFi delivers speeds 100x faster than WiFi : A super-fast alternative to WiFi known as 'LiFi' has moved beyond the research lab and into a real-world test after Estonian startup Velmenni has begun to offer the technology in a commercial setting. Velmenni is using LiFi to send data at up to 1Gbps – more than 100x using light bulbs.

Small chip solves rural coverage issues: A small chip designed by Saankhya Labs in Bengaluru could be a feasible solution in the short-term of connecting people in remote areas to the rest of the world. The chip, called Pruthvi, beams an internet connection to households which can receive a TV signal but are unable to benefit from a fixed broadband infrastructure. Pruthvi harnesses unused TV spectrum – known as White Space – to bring more people online than ever before.

Agriculture

Data preserved in soil: For traditional farming models, the primary determinantsare the availability and suitability of land. However, any idea of future potential must be built on current data, with what data there is then mapped to tell the story of a region. This story is effectively written in the dirt, the soil. The Africa Soil Information Service (ASIS) is developing continent-wide digital soil maps for sub-Saharan Africa using new analysis, statistics, field trials and crowdsourcing.

Greens fed on rainbow waste: Hydroponicsis a growing method based on use of mineral-enriched water, whereas aquaponics takes matters a step further, bringing together fish and plant farming in one recirculating system.

'Genetically Modified Food (GMF)': Genetically modifying a food involves introducing a gene into a fruit, vegetable, or animal from another organism. Broad scientific consensus suggests that genetically modified foods present no more danger than conventional food. GMFshave been commercially available since the 1990s and are most often associated with fruits and vegetables.



Education

E-learning: eLearning is learning or utilizing electronic technologies to access educational curriculum outside of a traditional classroom.

m-Learning: m-Learning is one of the latest developments in e-Learning which takes advantage of mobile devices for learning on accessible portable platforms. It is ideal for people on the go or for those who can't access a regular computer.

Virtual classroom: A virtual classroom is an online learning environment. The environment can be web-based and accessed through a portal or software-based and require a downloadable executable file.

Displays

OLED: An organic light-emitting diode (OLED) is a light-emitting diode (LED). They are used to create digital displays in devices such as television screens, computer monitors, portable systems such as mobile phones, handheld game consoles and PDAs.

3-d display: A stereo display also known as3D display is a display device capable of conveying depth perception to the viewer by means of stereopsis for binocular vision.

SPORTS

Kinetic Energy Recovery System (KERS)- Auto Racing: Used in Formula One racing, this 35-kilogram car part "recovers the kinetic energy that is present in the waste heat created by the car's braking process." It takes the energy used when a car brakes and uses it later on to boost acceleration.

Computerized Scoring- Bowling: The difficulty of keeping score manually can put people off of the game. Bowling, in particular, can be difficult for the infrequent alley visitor to score. However, using a computer eases the pain of scoring by 100 percent. Having a computer keeping the score can keep all your focus on your next ball rather than adding and multiplying pins.

Above the Net Camera-Hockey: One of the most game-changing devices, a camera above the net will primarily be used to see what goals passed the line, if it beat the clock, etc., just very basic events. The camera-evidence has changed the outcome of numerous games, all for the better.

The Headset-Football: The headset is the best technology football has to offer.Coaches up in the press box can see aerial views of the game, and with the headset they can relay information to the head honcho who may not be able to get that look at ground-level.

Heart Monitor-Training : Heart monitors help out the average joggers as well as the elite athletes. These devices can be used to alert athletes of dehydration and malnutrition. This is a simple wrist or strap-on mechanism that can warn people of an unsafe workout.

Advancements in protective gear : With bigger hits than ever on the field, athletes want to be more protected. Rob Vito guarantees that players won't get hurt on game day. Another company, evoSHIELD, creates gear for all 32 NFL teams. The technology is dubbed a 'second skin' and doesn't add a ton of bulk.

TRANSPORT

Maglev Trains : The maglev train has no wheels. So, these locomotives levitate. The tracks they run on are magnetized. The trains use the force this creates to propel themselves upward and forward at high speeds. Running these engines requires the consumption of only a small amount of fuel. Thus, in addition to being faster than traditional style locomotives, these ones are more eco-friendly and less costly to operate.

Electric Cars : The electric car is a good solution to the transportation crisis at hand. These automobiles are just plugged in to the appropriate outlet and then they are on the road. The cars do almost no harm to the environment and are also economical. One study published by IDC Energy Insights stated that by the end of 2015 there will be three million cars on the road.



Driverless Cars: A large and complex camera is mounted to the roof of driverless cars which is used to navigate the road. These cars are safer, if the technology is right, to ride in as a precisely calibrated robot is at the wheel. The automobiles also allow people to work or relax during a trip, as they eliminate the need to focus on the road. However, they are bad for the environment.

PRINTING

3D Printing : Printing is no longer limited to flat sheets of paper. 3D printing or additive manufacturing is a process of making 3-dimensional solid objects from a digital file. The creation of a 3D printed object is carried out using additive processes. In an additive process an object is created by laying down successive layers of material until the entire object is made. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object.

Hybrid Printing: Hybrid printing is where a mix of printing technologies are used on a press or finishing system to allow for adding variable data to offset or flexo printed content.

Print-on-demand : It is a book distribution method made possible by, and inseparable from, digital printing. It prints books only in response to orders, and only prints the exact amount ordered. With the capabilities of digital printing, print on demand is capable of filling an order for one book economically.

IT & Communication:

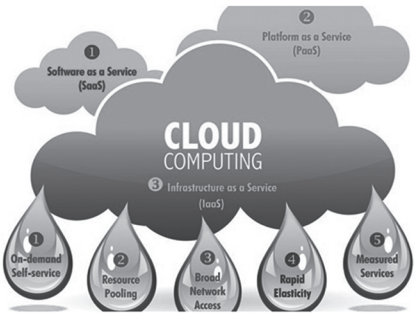
4G:4G (fourth generation) is the fourth generation of mobile telecommunications technology, succeeding 3G. It is an IP-based and packet-switched evolution of 3G technologies like WCDMA, HSDPA, CDMA2000 and EVDO that uses voice communications.

5G:5G (5th generation mobile networks or 5th generation wireless systems) denotes the next major phase of mobile telecommunications standards beyond the current4G/ IMT-Advanced standards.

Voice Recognition: It is the field of computational linguistics to develop methodologies and technologies that enable the recognition and translation of spoken language into text by computers and computerized devices such as Smart Technologies and robotics.

Cloud Technology : Cloud technology or cloud computing is the practice of storing, processing and managing data

in remote server connected through internet rather than a local server or personal computers. Cloud Computing benefits the user in no of ways like, companies can scale up their computing needs with increasing demand of their product and service in the market and then scale down again as demands decrease. The users only need to pay the amount for the services they will use rather than paying for the whole infrastructure unnecessarily. The the wider acceptance of cloud technology is due to the reason that it can provide multi-level services, such as private, public and hybrid i.e. from local to global host.



The leaders of cloud service provider are Amazon Web Services (AWS), Microsoft Azure, IBM/SoftLayer and Google Compute Engine. Keeping in view the type and extent of services, there are three basic models of cloud computing, infrastructure as a service (IaaS), platform as a service (PaaS) and software as service (SaaS). In a recent study it has been declared that as a result of increasing demand and wider acceptance of cloud services, it will touch the market of 250 billion dollar in 2017.

Ambient computing: 'Ambient computing' is the backdrop of sensors, devices, intelligence and agents that can put the concept to work. For example, getting a vending machine to book an order replenishment from the supply chain, through embedded sensors tracking stock levels.

BUSINESS

Dimensional marketing: Marketing has evolved significantly in the last half-decade. The evolution of digitally-connected customers lies at the core, reflecting the dramatic change in the dynamic between relationships and transactions. This modern era for marketing is likely to bring new challenges in the dimensions of customer engagement, connectivity, data and insight.

Amplified intelligence: Amplified intelligence is focused on deploying tools at points when a business really needs it for effective decision-making. Natural language processing techniques (allowing conversational interaction with a complex system), visualisation tools (letting individuals explore data on their own terms and find new patterns of discoveries), or advanced analytics mobile solutions (such as those embedded inside smartphones or tablets) are the examples.

CRM (customer relationship management): CRM software is a category of enterprise software that covers a broad set of applications and software designed to help businesses manage customer data and customer interaction, access business information, automate sales, marketing and customer support. It also manages employee, vendor and partner relationships.

Enterprise resource planning (ERP) : Enterprise resource planning (ERP) is the business process management software that allows an organization to

use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources. ERP software integrates all facets of an operation, including product planning, development, manufacturing, sales and marketing.

BANKING

Satellite Banking : Satellite banking is an upcoming technological innovation in the Indian banking industry, which is expected to help in solving the problem of weak terrestrial communication links in many parts of the country. The use of satellites for establishing connectivity between branches will help banks to reach remote areas in a better way, and offer better facilities, particularly in relation to electronic funds transfers.

Introduction of Biometrics: A number of banks have started the process of setting up ATMs enabled with biometric technology to tap the potential of rural markets. People in such areas do not adopt technology as fast as the urban centres due to the large scale illiteracy. Development of biometric technology has made the use of self service channels like ATMs viable with respect to the illiterate population.

Electronic Funds Transfer Systems: The beginning of the electronic funds transfer mechanisms began with the Electronic Funds Transfer (EFT) System. The EFT System was operationalized in 1995 covering 15 centres where the Reserve Bank managed the clearing houses.



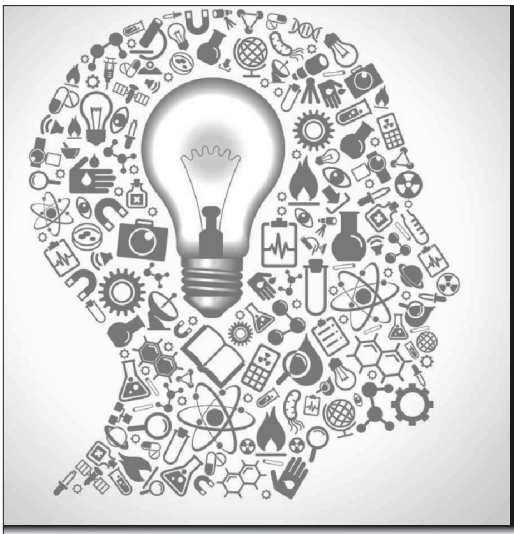
A new variant of the EFT called the National EFT (NEFT) was started (November 2005) to broad base the facilities of EFT. This was a nation-wide retail electronic funds transfer mechanism between the networked branches of banks. While RTGS is a real time gross settlement funds transfer product, NEFT is a deferred net settlement funds transfer product.

RTGS: The other payment and settlement systems deployed were mostly aimed at small value repetitive transactions, largely for the retail transactions. The introduction of RTGS in 2004 was instrumental in the development of infrastructure for Systemically Important Payment Systems (SIPS).

FILM PRODUCTION

Virtual reality: Virtual reality (VR), is a technology that offers new and exciting ways to consume information and entertainment. As a non-linear medium, VR brings a very different viewing experience to the table. VR offers exciting possibilities: as a dynamic new storytelling medium; as a rich narrative device within conventional film; and as a practical, time-saving preproduction tool.

Depth Sensors : Developed as a CGI-video hybrid, the software repurposes the depth-sensing camera from the Microsoft Kinect to capture and visualise the world as wireframe forms.By syncing the Depth Kit to the camera with which shooting is done, a 3D CGI sculpture for every frame of the film is captured, essentially producing a file of 3D animation that perfectly lined up to the film's characters and action.







GENERAL KNOWLEDGE QUIZ

1. Which was the largest site of Indus Civilization?
   (a) Mohenjodaro
   (b) Lothal
   (c) Chanhudaro
   (d) Dholavira
2. Which of the following sites is famous for stupas, monasteries, temples and pillars?
   (a) Gooty
   (b) Hatta
   (c) Sanchi
   (d) Amarjpura
3. Babur established Mughal rule in India through his victory in 1526, over
   (a) Rana Sanga
   (b) Sikandar Lodi
   (c) Daulat Khan Lodi
   (d) Ibrahim Lodi
4. The cavalry of Shivaji was known as
   (a) Risala (b) Sir-i-Naubat
   (c) Bergir (d) Paga
5. The first jute mill was set up in India in –
   (a) 1920 (b) 1850
   (c) 1855 (d) 1755
6. Who among the following created the Khalsa Panth?
   (a) Guru Teg Bahadur
   (b) Guru Hargobind
   (c) Guru Gobind Singh
   (d) Guru Arjan Dev
7. Who was the first Governor General of Bengal?
   (a) Warren Hastings
   (b) Robert Clive
   (c) William Bentinck
   (d) Lord Cornwallis
8. Who was the founder of Indian National Congress?
   (a) Gopal Krishna Gokhle
   (b) Allen Octavian Hume
   (c) Feroz Shah Mehta
   (d) Bipin Chandra Pal
9. Who is regarded as the ' Mother of the Indian Revolution' ?
   (a) Devika Rani
   (b) Madam Bhikaji Cama
   (c) Rani Laxmibai
   (d) Begum Hazrat Mahal
10. Arya Samaj was started by-
   (a) Swami Vivekananda
   (b) Raja Ram Mohan Roy
   (c) Swami Dayanand Saraswati
   (d) Gopal Krishna Gokhale
11. Bannerghatta National Park is situated in
   (a) Meghalaya
   (b) Rajasthan
   (c) Madhya Pradesh
   (d) Karnataka
12. The zonal soil type of peninsular India belongs to
   (a) red soils
   (b) yellow soils
   (c) black soils
   (d) older alluvium
13. The oldest rocks in India are reported from
   (a) Dharwar region, Karnataka.
   (b) Aravalli range, Rajasthan.
   (c) Vindhyan range, Madhya Pradesh.
   (d) Siwalik range, Punjab.
14. Which of the following crops is regarded as a plantation crop?
   (a) Coconut (b) Cotton
   (c) Sugarcane (d) Rice
15. The most ideal region for the cultivation of cotton in India is
   (a) the Brahmaputra valley
   (b) the Indo-Gangetic valley
   (c) the Deccan plateau
   (d) the Rann of Kutch
16. Albedo effect would be relatively higher in
   (a) Early morning and late evening
   (b) Early Morning only
   (c) Noon
   (d) Late evening only
17. The Aravallis mountain ranges are the example of-
   (a) old fold mountains
   (b) young fold mountains
   (c) Volcanic mountains
   (d) block mountains
18. The only state in India that produces saffron is-
   (a) Assam
   (b) Himachal Pradesh
   (c) Jammu and Kashmir
   (d) Meghalaya
19. The India's highest annual rainfall is reported at

(a) Namchi, Sikkim
(b) Churu, Rajasthan
(c) Mawsynram, Meghalaya
(d) Chamba, Himachal Pradesh

20. The typical area of sal forest in the Indian peninsular upland occurs
(a) on the western ghats
(b) between the Tapti and the Narmada
(c) to the north-east of the Godavari
(d) on the Malwa plateau

21. Who created fictional detective 'Feluda'?
(a) R.K. Narayan
(b) Satyajit Ray
(c) Mulk Raj Anand
(d) V.S. Naipaul

22. Which mythological weapon is depicted on the Param Vir Chakra medal?
(a) Vajra
(b) Khatvanga
(c) Sudarshan Chakra
(d) Kaumodaki

23. Shankar's International Dolls Museum, founded by renowned cartoonist K. Shankar Pillai which has the largest collection of costume dolls in the world, is located in which city?
(a) Mumbai
(b) New Delhi
(c) Chennai
(d) Kolkata

24. Which gas is the main constituent of 'Gobar Gas', the biogas generated by de-composition of cow dung?
(a) Butane (b) Propane
(c) Methane (d) Hydrogen

25. Which is the oldest football club in India?
(a) Mohun Bagan
(b) East Bengal
(c) Mohammedan Sporting
(d) Churchill Brothers

26. What name has been given to the first Boeing 747/700 jet, inducted into Indian Air Force, designed to work as the Indian President's office-in-the-sky?
(a) Samrat (b) Rajdoot
(c) Maharaja (d) Badshah

27. The novel 'Q & A', on which 8 Oscar awards winning film 'Slumdog Millionaire' (2008) is based, was authored by which Indian civil servant?
(a) Vikas Swarup
(b) Vikram Seth
(c) Amitav Ghosh
(d) Aravind Adiga

28. Ghatigaon Sanctuary, set up for the conservation of the Son Chiriya (great Indian bustard), is located in which state?
(a) Haryana
(b) Rajasthan
(c) Madhya Pradesh
(d) Karnataka

29. Which Indian state is the largest producer in the world of the golden coloured 'Muga' silk ?
(a) Assam
(b) Odisha
(c) West Bengal
(d) Karnataka

30. Under Annapurna Scheme by Central Government, how much food grain (wheat or rice) per month is given free to senior citizens (65 years or above age), who though eligible but remained uncovered under the National Old Age Pension Scheme (NOAPS)?
(a) 10 Kgs (b) 12 Kgs
(c) 15 Kgs (d) 20 Kgs

31. Which among the following is manufactured at Avadi (abbreviation for 'Armoured Vehicles and Ammunition Depot of India') town in Tamil Nadu?
(a) Maruti Cars
(b) HMT Tractors
(c) Tejas Aircrafts
(d) Arjun Tanks

32. Which was the first Indian company to list on the Nasdaq in 1999?
(a) Wipro
(b) Infosys
(c) Satyam Computers
(d) Tech Mahindra

33. 'Goal' is the autobiography of

which Indian sportsman?
(a) Wilson Jones
(b) Dhyan Chand
(c) K.D. Singh Babu
(d) Chunni Goswami

34. Which state is known as the 'Spice Garden of India'?
(a) Kerala
(b) Karnataka
(c) Andhra Pradesh
(d) Tamil Nadu

35. In addition to Uttar Pradesh, Bihar, Maharashtra, Karnataka, Madhya Pradesh, Telangana and Andhra Pradesh, which is the sixth Indian state to have both houses i.e. Vidhan Sabha and Vidhan Parishad ?
(a) Tamil Nadu
(b) Madhya Pradesh
(c) West Bengal
(d) Jammu & Kashmir

36. Who is the first Indian sportsman whose wax statue was inducted at Madame Tussaud's Wax Museum in London?
(a) Pankaj Advani
(b) Sachin Tendulkar
(c) Vishwanathan Anand
(d) Abhinav Bindra

37. In which town of Uttar Pradesh did Gautam Buddha attain Mahaparinirvana (salvation)?
(a) Lumbini
(b) Kushinagar
(c) Nanded
(d) Pavapuri

38. Who wrote the patriotic song `Saare Jahan Se Achcha' ?
(a) Rabindranath Tagore
(b) Bankim Chandra Chatterjee
(c) Muhammad Iqbal
(d) Kavi Pradeep

39. In which hill station is the Himalayan Mountaineering Institute (HMI) located?
(a) Darjeeling (b) Srinagar
(c) Nainital (d) Shimla

40. In India, the inflation rate represents the annual change (in percentage) in which index?
(a) Consumer Price Index (CPI)
(b) Consumer Confidence Index (CCI)
(c) Wholesale Price Index (WPI)
(d) Index of Industrial Production (IIP)

41. Directed by Satyajit Ray, the Apu Trilogy films - 'Pather Panchali', 'Aparajito' and 'Apur Sansar' - were based on the novels of which Bengali writer?
(a) Rabindranath Tagore
(b) Bankim Chandra Chatterjee
(c) Sharat Chandra Chatterjee
(d) Bibhutibhushan Bandopadhyay

42. In addition to Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand and West Bengal, the Tropic of Cancer passes through which north eastern states of India?
(a) Assam and Meghalaya
(b) Meghalaya and Manipur
(c) Manipur and Nagaland
(d) Tripura and Mizoram

43. In 1965, at which port was the India's first Free Trade Zone established?
(a) Kandla (Gujarat)
(b) Kochi (Kerala)
(c) Falta (West Bengal)
(d) Chennai (Tamil Nadu)

44. By what name is the Irish lady Margaret Elizabeth Noble, a disciple of Swami Vivekananda, better known?
(a) Meera Ben
(b) Mother Teresa
(c) Savitri Khanolkar
(d) Sister Nivedita

45. Which among the following is the indigenously developed Light Combat Aircraft (LCA) of India?
(a) Saras (b) Tejas
(c) Kiran (d) Chetak

46. Who authored the 'Gitanjali', an anthology of poems?
(a) Sumitranandan Pant
(b) Makhanlal Chaturvedi
(c) Rabindranath Tagore
(d) Maithili Sharan Gupt

47. To have legal rights for self-employed women like industrial workers, which lady activist founded Self-Employed Women's Association (SEWA)?
    (a) Aruna Roy
    (b) Ela Bhatt
    (c) Medha Patkar
    (d) Teesta Setalvad
48. Kailash Temple at Ellora in Maharahstra, the epitome of Indian rock-cut architecture, was built by the rulers of which dynasty?
    (a) Kadamba
    (b) Rashtrakuta
    (c) Chalukya
    (d) Satavahana
49. Anamudi Peak, located in the Idukki district of Kerala, is the highest peak of which Indian mountain range?
    (a) Aravali
    (b) Vindhyas
    (c) Sahyadri (W.Ghats)
    (d) Satpura
50. Which Indian state was originally known as the North East Frontier Agency (NEFA) ?
    (a) Manipur
    (b) Meghalaya
    (c) Arunachal Pradesh
    (d) Nagaland
51. Which Ramon Magsaysay Award winner, popularly known as Water Man, founded an NGO called 'Tarun Bharat Sangh' near Alwar in Rajasthan to work on watershed projects and rain-water harvesting?
    (a) Sandeep Pandey
    (b) Rajendra Singh
    (c) Mahesh Chandra Mehta
    (d) Arvind Kejriwal
52. What is the minimum age limit to become the President of India?
    (a) 25 years (b) 30 years
    (c) 35 years (d) 40 years
53. Which lake separates the Hyderabad, capital of Andhra Pradesh, from its twin city Secunderabad?
    (a) Loktak Lake
    (b) Chilka Lake
    (c) Wular Lake
    (d) Hussain Sagar Lake
54. In which city is the dargah (tomb) of sufi saint Moinuddin Chishti located ?
    (a) Mumbai
    (b) Srinagar
    (c) New Delhi
    (d) Ajmer
55. Who was the first person to address the United Nations in Hindi?
    (a) Morarji Desai
    (b) Atal Behari Vajpayee
    (c) V.P.Singh
    (d) P.V. Narasimha Rao
56. 'Ao', 'Sema' and 'Konyak' are the principal languages of which north-eastern Indian state?
    (a) Manipur
    (b) Meghalaya
    (c) Mizoram
    (d) Nagaland
57. Which princely state was the first to be annexed to the British East India Company under the Doctrine of Lapse policy, devised by Lord Dalhousie?
    (a) Satara
    (b) Sambalpur
    (c) Jhansi
    (d) Awadh
58. 'Gyandarshan' is an educational TV channel of which Indian open university?
    (a) Nalanda Open University, Patna
    (b) Dr.B.R.Ambedkar Open University, Hyderabad
    (c) Indira Gandhi National Open University, New Delhi
    (d) Netaji Subhas Open University, Kolkata
59. Which one of the following organisation was launched to help the poor in rural area to make them self employed
    (a) DPAP (b) IRDP
    (c) TRYSIM (d) DDP
60. Who among the following is called the "guardian of the public purse" of India?
    (a) Governor of Reserve bank of India

(b) Finance Minister of India
(c) Comptroller & Auditor General of India
(d) Supreme Court of India

61. The National Optic Fibre Network (NOFN) project is to link the optical fibre for offering a 100 mbps broadband service to which among the following levels?
(a) District
(b) Tehsil / Taluka
(c) Gram Panchayat
(d) Block Gram Panchayat

62. Setting up a supreme court in Calcutta was a part of?
(a) Regulating Act of 1773
(b) Pitts India Act of 1784
(c) Charter Act of 1793
(d) Charter Act of 1893

63. In which Constitutional Amendment Act Goa was made a full-fledged State with a State assembly?
(a) 43rd Constitutional Amendment Act, 1977
(b) 44th Constitutional Amendment Act, 1978
(c) 56th Constitutional Amendment Act, 1987
(d) 57th Constitutional Amendment Act, 1987

64. How many articles are there in Constitution of India?
(a) 395 (b) 397
(c) 448 (d) 410

65. Which of the following is not a constitutional body?
(a) Election Commission
(b) Planning Commission
(c) National Advisory Council
(d) Inter State Council

66. Which article ensures Abolition of Titles?
(a) Article 16 (b) Article 17
(c) Article 18 (d) Article 19

67 Who was India's Constitutional Advisor?
(a) B L Mitter
(b) K M Munshi
(c) B N Rao
(d) A.K.Iyer

68. Which Indian artist decorated the handwritten Copy of the Constitution?
(a) Mihir Sen
(b) S.N. Banerji
(c) Mukesh Bandhopadhyaya
(d) Nandalal Bose

69. The oath of office is administered to the Governor by the
(a) Chief Justice of India
(b) President
(c) Chief Justice of high court
(d) Speaker of legislative assembly

70. In which Constitutional Amendment Act Sikkim was made full-fledged State of the Union of India?
(a) 21st Constitutional Amendment Act
(b) 31st Constitutional Amendment Act, 1973
(c) 35th Constitutional Amendment Act, 1974
(d) 36th Constitutional Amendment Act, 1975

71. When Right to Information Act came into force in India?
(a) 10th October 2005
(b) 11th October 2005
(c) 12th October 2005
(d) 13th October 2005

72. In which Constitutional Amendment Act, seats of Lok Sabha were increased from 525 to 545?
(a) 21st Constitutional Amendment Act, 1967
(b) 24th Constitutional Amendment Act, 1971
(c) 25th Constitutional Amendment Act, 1971
(d) 31st Constitutional Amendment Act, 1973

73. Article 44 is related to?
(a) Uniform civil code for citizens.
(b) Provision of early childhood care and education to children below the age of 6 years.
(c) Duty of the state to raise the level of nutrition.
(d) Organization of agriculture and animal husbandry.

74. Who among the following is a famous Santoor player?
(a) Hari Prasad Chaurasia
(b) Ravi Shankar
(c) Zakir Hussain
(d) Shiv Kumar Sharma

75. Natya Shastra the main source of India classical dances was written by
(a) Bharat Muni
(b) Tandu Muni
(c) Narad Muni
(d) Abhinav Gupt
76. Kalaripayattu is a form of -
(a) Classical Dance
(b) Folk Dance
(c) Martial Art
(d) Dance Drama
77. The words 'Satyameva Jayate' inscribed below the base plate of the emblem of India are taken from which scripture.
(a) Ramayana
(b.) Mundaka Upanishad
(c) Rigveda
(d) Satpath Brahmana
78. Where is the largest concentration of Stupas in India?
(a) Himachal Pradesh
(b) Andhra Pradesh
(c) Madhya Pradesh
(d) Arunachal Pradesh
79. Who wrote "Lehar" (Wave)?
(a) Suryakanth Tripathi
(b) Jaishankar Prasad
(c) Maithili Sharan Gupt
(d) Yashpal
80. Where is the Brihadeswara or Rajarajeshwara temple situated?
(a) Thanjavur in Tamil Nadu
(b) Murshidabad in West Bengal
(c) Jamnagar in Gujarat
(d) Thiruvananthapuram in Kerala
81. Which one of these schools of the performing arts was founded in 1953?
(a) Sangeet Natak Academy
(b) Margi
(c) Kerala kalamandalam
(d) School of Drama
82. Manusmrithi was translated into English by-
(a) Macauely
(b) J.S Mill
(c) William Jones
(d) Max Muller
83. Who wrote Gita Govinda?
(a.) Jayadeva
(b) Tuka Ram
(c) Tulsi Das
(d) Purandava Das
84. Who wrote 'Poverty and Un-British Rule in India'?
(a) R.C Datt
(b) Charlies Wood
(c) M.N Roy
(d) Dadabai Navaroji
85. Who wrote Charaka Samhita?
(a) Kautiliya (b) Charaka
(c) Aryabatta (d) Chanakya
86. Who is the Sanskrit Scholar in the court of Chandragupta II?
(a) Bimbisara
(b) Ariean
(c) Amarsimba
(d) Bindu Sar
87. Who was the founder of Mourya dynasty?
(a) Karikala
(b) Raja Raja
(c) Chandragupta Mourya
(d) Ashok
88. Which city is known as the Pittsburg of India?
(a) Jamshedpur
(b) Kerala
(c) New Delhi
(d) Punjab
89. India's first Defence University is set up in-
(a) Haryana
(b) Uttar Pradesh
(c) Punjab
(d) Delhi
90. "Pahla kadam , pahli udan" account is launched by which bank ?
(a) SBI
(b) Andhra Bank
(c) Bank of Baroda
(d) Canara Bank
91. Which one of the following Constitutes limitation upon the concept of 'judicial review' in India?
(a) Rule of Law
(b) Due Process
(c) Procedure established by law
(d) Equal Protection of law
92. When, for the first time, did the Prime Minister of India

announce the 20-point Economic Programme?
(a) 1973 (b) 1974
(c) 1975 (d) 1976

93. How much a customer will have to pay for using Automated Teller Machines (ATMs) beyond the permitted numbers of transactions in Delhi, Mumbai, Chennai, Bangalore, Kolkata and Hyderabad?
(a) ₹50/- (b) ₹15/-
(c) ₹20/- (d) ₹22/-

94. Name the Card launched by Indian Railways to avoid payment transaction during ticket booking?
(a) Go India smart Card
(b) Metro Card
(c) Smart Citizen Card
(d) Adhar Card

95. Beti Bachao Beti Padhao Scheme was launched by which ministry?
(a) Ministry of Women and Child Development
(b) Ministry of Human Resource Development
(c) Ministry of Home Affairs
(d Ministry of Health and Family Welfare

96. The committee on Cauvery water dispute was known as:
(a) P. Sathasivam
(b) H. L. Dattu
(c) B.S Chauhan
(d) K. G. Balakrishnan

97. RBI Adjusts Liquidity by which tool?
(a) Cash Reserve Ratio (CRR)
(b) Statutory Liquidity Ratio (SLR)
(c) Liquidity Adjustment Facility (LAF)
(d) Market Stabilisation Scheme (MSS)

98. IFSC Code contains how many digits:
(a) 5 (b) 11
(c) 14 (d) 17

99. In NSDL, the letter S stands for
(a) Scheme (b) Statistics
(c) Security (d) Service

100. Which of the following organizations look after the credit needs of agriculture and rural development in India
(a) FCI (b) IDBI
(c) NABARD (d) ICAR

Answer Key

1 (a)	2 (c)	3 (d)	4 (d)	5 (c)	6 (c)
7 (a)	8 (b)	9 (b)	10 (c)	11 (d)	12 (a)
13 (a)	14 (a)	15 (c)	16 (a)	17 (a)	18 (c)
19 (c)	20 (d)	21 (b)	22 (a)	23 (b)	24 (c)
25 (a)	26 (b)	27 (a)	28 (c)	29 (a)	30 (a)
31 (d)	32 (b)	33 (b)	34 (a)	35 (d)	36 (b)
37 (d)	38 (c)	39 (a)	40 (c)	41 (d)	42 (d)
43 (a)	44 (d)	45 (b)	46 (c)	47 (b)	48 (b)
49 (c)	50 (c)	51 (b)	52 (c)	53 (d)	54 (d)
55 (b)	56 (d)	57 (a)	58 (c)	59 (c)	60 (c)
61 (c)	62 (a)	63 (c)	64 (c)	65 (c)	66 (c)
67 (c)	68 (d)	69 (c)	70 (d)	71 (c)	72 (d)
73 (a)	74 (d)	75 (a)	76 (c)	77 (b)	78 (c)
79 (b)	80 (a)	81 (a)	82 (c)	83 (a)	84 (d)
85 (b)	86 (c)	87 (c)	88 (a)	89 (a)	90 (a)
91 (d)	92 (c)	93 (c)	94 (a)	95 (a)	96 (c)
97 (c)	98 (b)	99 (c)	100 (c)		

INTERNATIONAL

1. Who wrote the famous novel "Alice's Adventures in Wonderland"?
   (a) Rudyard Kipling
   (b) John Keats
   (c) Lewis Carroll
   (d) H G Wells
2. Who is referred to as the Father of Comedy?
   (a) Aeschylus
   (b) Sophocles
   (c) Aristophanes
   (d) Philip
3. Who was the first to complete the circumnavigation of Earth?
   (a) Francis Drake
   (b) Columbus
   (c) Magellan
   (d) Vasco da Gama
4. How many lines are there in a Sonnet?
   (a) 8 (b) 10
   (c) 12 (d) 14
5. Which historical events are in the correct chronological order?
   (a) Crusades→Renaissance →Neolithic Revolution → Roman Empire
   (b) Roman Empire →Neolithic Revolution → Crusades → Renaissance
   (c) Renaissance →Neolithic Revolution → Crusades → Roman Empire
   (d) Neolithic Revolution→ Roman Empire → Crusades → Renaissance
6. Habeas Corpus was first codified in which year?
   (a) 1679 (b) 1680
   (c) 1694 (d) 1991
7. In which year was the first officially recognised cricket Test match played?
   (a) 1905 (b) 1971
   (c) 1877 (d) 1977
8. The Nobel prize was instituted by which country?
   (a) USA (b) UK
   (c) Russia (d) Sweden
9. Which of the following is an award instituted by UNESCO?
   (a) Kalinga Award
   (b) Pulitzer prize
   (c) Stirling prize
   (d) Pritzker prize
10. Magsaysay award is given by
    (a) USA
    (b) UK
    (c) Malaysia
    (d) Philippines
11. What is the meaning of term "Mohenjodaro"?
    (a) Mound of the sorrow
    (b) Mound of the life
    (c) Mound of the struggle
    (d) Mound of the dead
12. Which place is referred to as 'roof of the world'?
    (a) Mt. Kilimanjaro
    (b) The Pamirs, the Himalayas
    (c) Godwin Austen
    (d) Broad Peak
13. Which of the following organisations is not associated with the UNO?
    (a) ILO (b) WHO
    (c) ASEAN (d) All of the above

14. Where is the headquarters of UNESCO situated?
    (a) Rome
    (b) Geneva
    (c) New York
    (d) Paris
15. The main aim of SAARC is
    (a) Regional Cooperation
    (b) Internal affairs
    (c) Non-alignity
    (d) Peaceful Coexistence
16. The five permanent members of UN Security Council are
    (a) Japan, West Germany, USSR, UK and USA
    (b) Canada, China, France, USSR and USA
    (c) Germany, China, USSR, UK and USA
    (d) China, France, USSR, UK and USA
17. Which of the following is the headquarters of World Trade Organisation (WTO)?
    (a) New York
    (b) Geneva
    (c) Madrid
    (d) Paris
18. The Great Victoria Desert is located in
    (a) Canada
    (b) West Africa
    (c) Australia
    (d) North America
19. Which of the following is tropical grassland?
    (a) Taiga
    (b) Savannah
    (c) Pampas
    (d) Prairies
20. The humidity of the air depends upon
    (a) Temperature
    (b) Location
    (c) Weather
    (d) All of the above
21. The least explosive type of volcano is called
    (a) Cinder cone
    (b) Basalt plateau
    (c) Shield volcanoes
    (d) Composite volcanoes
22. Which is the largest country of the world in terms of geographical area?
    (a) Vatican City
    (b) Australia
    (c) USA
    (d) Russia
23. The highest average salinity amongst the following seas is reported from
    (a) Dead Sea
    (b) Red Sea
    (c) Black Sea
    (d) Mediterranean Sea
24. Who invented the ball point pen?
    (a) Waterman Brothers
    (b) Bicc Brothers
    (c) Biro Brothers
    (d) Wright Brothers
25. Which scientist discovered the radioactive element radium?
    (a) Isaac Newton
    (b) Albert Einstein
    (c) Benjamin Franklin
    (d) Marie Curie
26. Who invented Dynamite?
    (a) Sir Alexander Graham Bell
    (b) Benjamin Franklin
    (c) Thomas Alva Edison
    (d) Alfred B. Nobel

27. Who is considered to be the founder of the modern frozen food industry?
    (a) F. Rozenosh
    (b) G. Findus
    (c) R. Scott
    (d) C. Birdseye
28. Who invented Bakelite?
    (a) Charles Goodyear
    (b) Roy Plunkett
    (c) Leo Henricus Baekeland
    (d) Henry Ford
29. When was the toothbrush first mass-produced?
    (a) 1742 (b) 1790
    (c) 1765 (d) 1780
30. Who invented capillary feed Fountain Pen?
    (a) John J. Loud
    (b) Sir Frank Whittle
    (c) Lewis E. Waterman
    (d) Kirkpatrick Macmillan
31. Who is the father of English Poetry?
    (a) Charles Dickens
    (b) John Milton
    (c) Geoffrey Chaucer
    (d) William Wordsworth
32. Who wrote the novel War and Peace?
    (a) Leo Tolstoy
    (b) Mahatma Gandhi
    (c) Charles Dickens
    (d) Rudyard Kipling
33. When was the Nobel Prize instituted?
    (a) 1927 (b) 1895
    (c) 1901 (d) 1896
34. Who was the first woman to win the Nobel Prize?
    (a) Marie Curie
    (b) Bertha von Suttner
    (c) Selma Lagerlöf
    (d) Grazia Deledda
35. Who is called as "The Father of History"?
    (a) Euclid
    (b) Herodotus
    (c) Aristotle
    (d) Julius Caesar
36. Who is the creator of the famous character "Sherlock Holmes"?
    (a) Arthur Conan Doyle
    (b) Ian Fleming
    (c) Dr. Watson
    (d) Shakespeare
37. Who wrote the novel "Anna Karenina"?
    (a) Lewis Carroll
    (b) Leo Tolstoy
    (c) Victor Hugo
    (d) Boris Pasternak
38. Who directed the world famous film 'The Gandhi'?
    (a) Satyajit Ray
    (b) Mrinal Sen
    (c) Richard Attenborough
    (d) Ben Kingsley
39. Who has written the book "The Famished Road"?
    (a) Zola Emile
    (b) Ben Okri
    (c) V.S. Naipaul
    (d) Ian Austin
40. Who wrote the novel "A Farewell to Arms"?
    (a) Charles Dickens
    (b) Ernest Hemingway
    (c) Thomas Hardy
    (d) Aldous Leonard Huxley

41. Who wrote the controversial novel "The Satanic Verses"?
    (a) William Golding
    (b) Gunnar Myrdal
    (c) Salman Rushdie
    (d) Agatha Christie
42. Who is the author of the novel Les Misérables?
    (a) Victor Hugo
    (b) ALium tofler
    (c) G.Wynne
    (d) Agatha Christie
43. Who wrote the book 'Gulliver's Travels'?
    (a) Jonathan Swift
    (b) Charles Dickens
    (c) Charles Lamb
    (d) Alexandra Dumas
44. Who wrote the book 'Tom Sawyer'?
    (a) William Shakespeare
    (b) John Ruskin
    (c) Mark Twain
    (d) Leo Tolstoy
45. Who wrote the 16th-century political treatise "The Prince"?
    (a) George Bernard Shaw
    (b) V.S. Naipaul
    (c) Emile Zola
    (d) Niccolo Machiavelli
46. Who wrote the novel "Crime and Punishment"?
    (a) Vladimir Nabakov
    (b) Lewis Carrol
    (c) Fyodor Dostoevsky
    (d) Alexander Solzhenitsyn
47. Who was the first woman to go to space?
    (a) Valentina Tereshkova
    (b) Sally Ride
    (c) Sunita Williams
    (d) Liu Yang
48. Anthropology is the study of?
    (a) Science
    (b) Psychology
    (c) Literature
    (d) Humanity
49. The working languages of the UNESCO is/are
    (a) French only
    (b) English only
    (c) English and French
    (d) English, French and Russian
50. 'World Cancer Day' is observed on
    (a) 19th February
    (b) 4th February
    (c) 12th February
    (d) 17th January
51. Who invented Mobile phone?
    (a) Graham Bell
    (b) Martin Cooper
    (c) Edison
    (d) Larry Page
52. Who among the following is the co-founder of Google?
    (a) Larry Page
    (b) Time Berners-Lee
    (c) Philippe Kahn
    (d) Richard Davis
53. Who is regarded as the inventor of Denim Jeans?
    (a) Levi Strauss
    (b) Jacob Davis
    (c) William P. Pants
    (d) Flinders Petrie
54. The Last Super, a famous renaissance painting was a master piece of
    (a) Leonardo da Vinci
    (b) Raphael
    (c) Michael Angelo
    (d) Titian

55. The terms Liberty, Equality and Fraternity are associated with which of the following?
    (a) Industrial Revolution
    (b) Russian Revolution
    (c) French Revolution
    (d) Olympic Games
56. Who was the author of the American Declaration of Independence?
    (a) George Washington
    (b) Thomas Paine
    (c) Thomas Jefferson
    (d) Marquis de Lafayette
57. Who painted the world famous painting Guernica?
    (a) Van Gogh
    (b) Michelangelo
    (c) Pablo Picasso
    (d) Leonardo-da-Vinci
58. Who authored the book The Social Contract?
    (a) Voltaire
    (b) Denis Diderot
    (c) Jean-Jacques Rousseau
    (d) Aristotle
59. Who discovered the sea-route from Europe to India?
    (a) Christopher Columbus
    (b) Vasco-da-Gama
    (c) Marco Polo
    (d) Magellan
60. What was the codename of the atom bomb dropped by the USA on Hiroshima in Japan during the Second World War?
    (a) Little Boy
    (b) Little Angel
    (c) Little Fly
    (d) Little Devil
61. Where was Napolean sent in exile after the battle of waterloo?
    (a) St. Helena (b) Elba
    (c) Capri (d) Corsica
62. Who defined Democracy as the Government of the people, by the people and for the people?
    (a) George Washington
    (b) John Stuart mill
    (c) Abraham Lincoln
    (d) Winston Churchill
63. Das Capital and Communist Manifesto were written by
    (a) Engels
    (b) Trotsky
    (c) Karl Marx
    (d) Lenin
64. The Battle of Waterloo in the year 1815 was fought between
    (a) Britain and France
    (b) Britain and Germany
    (c) Japan and China
    (d) Austria and Russia
65. When was the Magna Carta Signed by King John of England?
    (a) 1212 (b) 1217
    (c) 1215 (d) 1066
66. When did the Second World War end?
    (a) 1918 (b) 1946
    (c) 1939 (d) 1945
67. The Boston Tea Party took place in which year?
    (a) 1776 (b) 1773
    (c) 1774 (d) 1770
68. Which style of painting was used by early renaissance artists?
    (a) Graeco-Roman
    (b) Catholic Art
    (c) Gothic
    (d) None of these

69. Where was John F. Kennedy assassinated?
    (a) Seattle
    (b) Dallas
    (c) Chicago
    (d) Boston
70. Who developed the first successful printing press?
    (a) Johannes Gutenberg
    (b) Albert Einstein
    (c) Benjamin Franklin
    (d) Issac Newton
71. Which two countries fought in the Hundred Years' War?
    (a) France and Germany
    (b) England and Germany
    (c) Italy and France
    (d) England and France
72. Which country do the Vikings belong?
    (a) England
    (b) France
    (c) Italy
    (d) Scandinavia
73. In what year did American women win the right to vote?
    (a) 1905
    (b) 1920
    (c) 1875
    (d) 1930
74. Who was the first woman to run for President in USA?
    (a) Belva Ann Lockwood
    (b) Sonia Johnson
    (c) Linda Jenness
    (d) Victoria Woodhull
75. Who was the first woman to be U.S. Secretary of State?
    (a) Condoleezza Rice
    (b) Madeleine Albright
    (c) Carol Moseley Braun
    (d) Elizabeth Dole
76. What is the longest River in the world?
    (a) Nile (b) Amazon
    (c) Thames (d) Ganges
77. Who invented the game of basketball?
    (a) James Naismith
    (b) Bruce Ames
    (c) Edwin Howard Armstrong
    (d) Amos Alonzo Stagg
78. Which country held the first Olympic Games?
    (a) England
    (b) Greece
    (c) Peru
    (d) Canada
79. What was the name of the first person to set foot on the moon?
    (a) Neil Armstrong
    (b) Edwin Aldrin
    (c) Yuri Gagrin
    (d) Buzz Aldrin
80. World War I began in which year?
    (a) 1923
    (b) 1914
    (c) 1909
    (d) 1917
81. Which general famously stated 'I shall return'?
    (a) Bull Halsey
    (b) George Patton
    (c) Douglas MacArthur
    (d) Omar Bradley
82. Which disease ravaged and killed a third of Europe's population in the 14th century?
    (a) The White Death
    (b) Malaria
    (c) Smallpox
    (d) The Bubonic Plague

83. Which theatre in London associated with William Shakespeare?
    (a) Oxford University Theatre
    (b) Broadway
    (c) The London Palladium
    (d) The Globe
84. What famous 5th century A.D conqueror was known as 'The Scourge of God'?
    (a) Atila the hun
    (b) William the conqueror
    (c) Julius Caesar
    (d) Hannibal
85. Where is the headquarters of FIFA situated?
    (a) Zurich
    (b) Sao Paulo
    (c) London
    (d) Dubai
86. Which is the oldest Grand Slam tennis tournament?
    (a) Wimbledon
    (b) French open
    (c) Australian open
    (d) US open
87. When was the first Summer Olympic Games held?
    (a) 1900
    (b) 1902
    (c) 1894
    (d) 1896
88. The "Mein Kampf" was written by
    (a) Adolf Hitler
    (b) Mussolini
    (c) Bismarck
    (d) Mazzini
89. The parliament of Russia is known as
    (a) Federal Assembly of Russia
    (b) Shora
    (c) National Assembly
    (d) Folketing
90. Grammy award is given in the field of
    (a) Acting
    (b) Music
    (c) Singing
    (d) Boxing
91. The religious text of the Jews is named as
    (a) The Analectus
    (b) Torah
    (c) Tripitika
    (d) Zend-Avesta
92. Which country's currency is Ngultrum?
    (a) Laos
    (b) Nepal
    (c) Bhutan
    (d) Bangladesh
93. The Crimean War came to an end by the
    (a) Treaty of St. Germain
    (b) Treaty of Trianon
    (c) Treaty of Versailles
    (d) Treaty of Paris
94. The name of Pierre Cardin is associated with
    (a) Painting
    (b) Films
    (c) Pop Music
    (d) Fashion Designing
95. What is the second largest desert in the world after the Sahara desert?
    (a) Arabian Desert
    (b) Gobi Desert
    (c) Kalahari Desert
    (d) Libyan Desert
96. World Environment Day run by the UNEP on
    (a) 11th Dec.
    (b) 20th Dec.
    (c) 15th Sept.
    (d) 5th June

97. International Human Rights Day is observed on
    (a) 10th Dec.
    (b) 24th Oct.
    (c) 25th Nov.
    (d) None of these
98. When is the World Population Day observed?
    (a) July 8
    (b) July 10
    (c) July 11
    (d) July 19
99. WTO came into existence in the year
    (a) 1977
    (b) 1985
    (c) 1995
    (d) 1950
100. The first summit of SAARC was held at
    (a) Kathmandu
    (b) Colombo
    (c) New Delhi
    (d) Dhaka

Answer Key

1. (c)	2. (c)	3. (c)	4. (d)	5. (d)	6. (a)
7. (c)	8. (d)	9. (a)	10. (d)	11. (a)	12. (b)
13. (c)	14. (d)	15. (a)	16. (d)	17. (b)	18. (c)
19. (b)	20. (d)	21. (b)	22. (d)	23. (a)	24. (c)
25. (d)	26. (d)	27. (d)	28. (c)	29. (d)	30. (c)
31. (c)	32. (a)	33. (b)	34. (a)	35. (b)	36. (a)
37. (b)	38. (c)	39. (b)	40. (b)	41. (c)	42. (a)
43. (a)	44. (c)	45. (d)	46. (c)	47. (a)	48. (d)
49. (d)	50. (b)	51. (b)	52. (a)	53. (a)	54. (a)
55. (c)	56. (c)	57. (c)	58. (c)	59. (b)	60. (a)
61. (a)	62. (c)	63. (c)	64. (a)	65. (c)	66. (d)
67. (b)	68. (a)	69. (b)	70. (a)	71. (d)	72. (d)
73. (b)	74. (d)	75. (b)	76. (a)	77. (a)	78. (b)
79. (a)	80. (b)	81. (c)	82. (d)	83. (d)	84. (a)
85. (a)	86. (a)	87. (d)	88. (a)	89. (a)	90. (b)
91. (b)	92. (c)	93. (d)	94. (d)	95. (a)	96. (d)
97. (a)	98. (c)	99. (c)	100. (d)		

LATEST UPDATES CAPSULE

PEOPLE

PM Narendra Modi

Nobody can explain what exactly makes PM Narendra Modi so popular among his supporters as well as his detractors. Modi is both an 'enigma' and an 'open book'. He is widely known as a person who wears his heart on his sleeves. Even his opponents admire him for his bold and fearless stand on sensitive issues. He has taken some major initiatives that include the Jan Dhan scheme, the MUDRA Bank and the Swachh Bharat Mission for the welfare of the poor in the past one year.

'Start up Stand up India' initiative to create more jobs was recently launched. He ensured that LPG subsidy reaches the targeted person directly, the Soil Health Card scheme was launched to enhance farm productivity and reduce expenses; steps were taken towards providing jobs through initiatives like 'Make in India'; reservation of women in the police forces of Union Territories. All these have been done even when there were no elections around the corner. With his recent unscheduled visit to Pakistan, Modi appeared to send a strong public message that the ambiguous course he has taken toward Pakistan has shifted to embrace engagement, not confrontation.

Vladimir Putin

Vladimir Putin served as president of Russia from 2000 to 2008, and was re-elected to the presidency in 2012. He has also served as Russia's prime minister. In 2014, he was reportedly nominated for a Nobel Peace Prize. Under Putin, Russia has changed beyond all recognition from the chaotic, open free-for-all it was under Yeltsin. The progress made by the Russian economy in the past eight years is truly impressive. GDP has gone up about 70%, industrial growth has been 75% and investments have increased by 125%, bringing Russia at its place among the world's top 10 economies. Russia has also become an energy superpower thanks to a policy under which the government controls a substantial part of the oil and gas sector and its revenues.

Putin has also his share of failures. Internationally he faces isolation, sanctions, a new cold war even. At home, despite economic decline Putin enjoys perhaps the highest popularity rating of any Kremlin leader – an approval rating that topped 86% last year. Love him or hate him, it's hard to deny that Putin has made a huge impact on his country and the World.

François Hollande

People know François Hollande as the man who won France's presidential election snatching power from Nicolas Sarkozy. His presidential victory aside, the 57-year-old doesn't wield a political resumé studded with headline-grabbing accomplishments. Hollande has no previous experience in a national government position. His 1997-2008 stint as head of France's Socialist Party (PS) represents his highest-profile role.

Among his achievements, Hollande's economic policies are wide-ranging, including supporting the creation of a European credit rating agency, the separation of lending and investment in banks. He has also announced his personal support for same-sex marriage and adoption for LGBT couples. Apart from these, pension reforms, labour reforms have been carried out by him. He did manage to pass a few important laws that will shape France for many years. Anyway, so far, it is not possible to judge his success or failure yet.

Maithripala Sirisena

Mithripala Sirisena has won the 2015 Presidential Elections of Sri Lanka. Former President Mahinda Rajapaksa from United People's Freedom Alliance got 47.6 percent while opposition candidate Maithripala from United National Party got 51.3 percent of the votes polled in the Presidential elections held on 8 January 2015. Until November 2014 he was general secretary of the Sri Lanka Freedom Party and health minister.

Sushma Swaraj

Sushma Swaraj is one of those women politicians who dominate the Indian politics currently.

During her tenure as India's External Affairs Minister, she has emerged as no-nonsense, hard-working, result-oriented External Affairs Minister who has been a go-getter in several humanitarian crisis situations. Let us not get into the long list of foreign dignitaries she has met during her tenure at home or abroad because it is her job.

To begin with, her ministry resolved hostage crisis of Indian nurses in Iraq or the hostage crisis involving 39 Indian construction workers who were snatched by Islamic State (IS) in Iraq in June last year. Her achievement in rushing drinking water supplies to Maldives when it was needed most urgently as the SAARC neighbour had its sole water desalination plant knocked down because of fire was commendable. Her recent visit to Israel and Palestine on January 17-18 has built on the goodwill generated by the trip of President Pranab Mukherjee to the two West Asian nations three months back.

Lalu Prasad Yadav

The grand victory of the grand alliance of Nitish Kumar and Lalu Prasad in the crucial Bihar poll was possible only because of Lalu Prasad Yadav who proved the real game changer, according to political analysts. The RJD of Mr.Prasad won more seats than JD(U) of Mr.Kumar. Of the total 49 Yadav candidates that the RJD fielded, 42 won the poll while 12 out of the 16

Muslim candidates bagged the seats. Similarly, out of the total 13 Yadav candidates the JD(U) had fielded, 11 won the poll while out of seven Muslim contestants, five won.

Lalu Prasad shot to the limelight in the 1970s and became Chief Minister of Bihar in the 1990s. He was Union Railway Minister in the 2000s. Just when everybody thought it was curtains for him, he has risen like a phoenix in the 2015 Bihar Assembly elections. Though many accusations have been made about him citing him as an encourager of criminality and 'Gunda Raj' in Bihar, he remains a crowdpuller, shrewd and colourful politician. He has also been attacked for promoting and encouraging caste-based politics and there are a number of corruption cases against him pending in the court like the Fodder Scam, he remains a front-runner.

Late J & K Chief Minister Mufti Mohammad Sayeed

Chief Minister of Jammu and Kashmir Mufti Mohammad Sayeed died of multiple organ failure in New Delhi on 7 January 2016 after nearly a week-long hospitalisation. He was 79. Mr Sayeed, a two-time chief minister, began his second tenure on March 1st, 2015 in alliance with the BJP, having led the State government between 2002 and 2005. He was the founder of the Jammu and Kashmir People's Democratic Party (JKPDP). In a long career in politics, Mr Sayeed remained in congress till 1987. He was Minister for Tourism in the Rajiv Gandhi government in 1986, after which he joined former Prime Minister V P Singh's National Front government as Home Minister. Mr. Sayeed's daughter Mehbooba Mufti is considered to be his political heir.

Kailash Satayarthi

Kailash Satayarthi dedicated his Nobel Peace Prize to the Nation on 7 January 2015. The Medal will be put up on display at the Rashtrapati Bhavan museum. The medal is made of 18-carat gold and weighs 196 gram. Satayarthi becomes the second Indian to dedicate his noble prize to nation after CV Raman who received the Nobel Prize for Physics in 1930.

Puja Thakur

Pooja Thakur, wing Commander on 25 January 2015 became the first lady officer to lead the Inter-Service Guard of Honour for a major visiting dignitary at the Rashtrapati Bhavan (presidential palace). The Guard of Honour was witnessed by the US President Barack Obama. Thakur leading the Inter-Service Guard of Honour was in line with the theme of Nari Shakti (Women Power) chosen for the 2015 Republic Day parade.

Late Varadarajan, Neeraj Kumar

Major Mukund Varadarajan and Naik Neeraj Kumar Singh were on 26 January 2015 posthumously awarded with the highest peacetime military honour the Ashok Chakra. President Pranab Mukherjee gave away the awards to their wives at the 66th Republic Day celebrations. Both army men sacrificed their lives while battling groups of militants in separate operations in Shopian and Kupwara districts of Kashmir.

Vikram Patel

A Psychiatrist and Professor of International Mental Health at the London School of Hygiene & Tropical Medicine, Dr. Vikram Patel has been named in the Time magazine's annual list of the 100 most influential people in the world, 2015 TIME 100. He is the founding and Joint Director of the Centre for Global Mental Health.

Ashok Alexander Sridharan

Ashok Alexander Sridharan was on 21 October 2015 sworn in as the mayor of Bonn in Germany. Sridharan was elected to the office as a candidate of the German Chancellor Angela Merkel-led Christian Democratic Union of Germany (CDU) party in an election held in September 2015. Now, Sridharan becomes the first Person of Indian Origin (PIO) to be elected as the mayor of a major city in Germany.

Queen Elizabeth II

Queen Elizabeth II has become the longest reigning monarch in British history. She beats the record set by her great-great-grandmother Queen Victoria — 63 years and 7 months — more than a century ago. Elizabeth has been the constant heart of British life since she came to the throne as a young lady aged 25. Born April 21, 1926 in London, the queen was christened Elizabeth Alexandra Mary of York and was known as young Lilibet to her family.

Malcolm Turnbull

New Australian Prime Minister Malcolm Turnbull was sworn in as Australia's 29th prime minister on 15th September after a surprise ballot of his conservative Liberal Party colleagues voted 54-44 to replace Tony Abbott. The new prime minister has promised to focus on stability and improving a faltering economy.

Justice Tirath Singh Thakur

Justice Tirath Singh (TS) Thakur was on 3 December 2015 sworn in as 43rd Chief Justice of India (CJI) by President Pranab Mukherjee at Rashtrapati Bhavan, New Delhi. Thakur succeeded incumbent Justice H L Dattu who retired on 2 December 2015. He will have the tenure as CJI for over one year and will retire on 4 January 2017.

Arunima Sinha

Arunima Sinha, the amputee mountaineer who set a record by climbing the Mount Everest on 25 December 2015, conquered Mount Aconcagua in Argentina. Arunima started her journey on 12 December 2015 and hoisted the Indian tricolour on 25 December. With this, Arunima has become the first female amputee to climb 5 Mountains of the World.

Dr Gyanendra D Bandgaiyan

The appointment of Dr Gyanendra D Bandgaiyan as the Director General of the National Centre for Good Governance was approved by the Appointments Committee of the Cabinet (ACC) on 30 December 2015. Dr Bandgaiyan is a former IAS officer of the Union Territories cadre and hails from Madhya Pradesh.

EVENTS

Sikkim becomes India's first fully organic state

Sikkim has become India's first fully organic state by converting around 75,000 hectares of agricultural land into sustainable cultivation. Prime Minister Narendra Modi formally announced this at a sustainable agriculture conference in Gangtok on 18 January. Around 75,000 hectares of agricultural land was gradually converted to certified organic land by implementing organic practices and principles as per guidelines laid down in National Programme for Organic Production. In 2003, the Pawan Chamling-led government decided to make Sikkim an organic farming state through a declaration in the legislative assembly. Later, the entry of chemical inputs for farmland was restricted, and their sale banned. As a result, farmers had no option but to opt for organic.

Organic cultivation is free of chemical pesticides and chemical fertilisers as it tries to strike a harmonious balance with a complex series of ecosystems. On the other hand, organic farming leads in subsistence of agriculture, bio-diversity conservation and environmental protection, agriculture secretary. Sustainable farming will also help in building the soil health resulting in sustainable increased crop production. Besides, it will also boost the tourism industry in the Himalayan state.

Amitabh Bachchan and Priyanka Chopra become 'Incredible India' new brand ambassadors

After much controversy over the actor Aamir Khan's intolerance statement, actors Amitabh Bachchan and Priyanka Chopra have been chosen as the brand ambassadors for the government's 'Incredible India' campaign. Aamir Khan had promoted Indian tourism for a decade as the brand ambassador. Several icons from bollywood and other fields, including famous sports personalities, were shortlisted by the tourism ministry to be the face of the 'Incredible India' campaign.

Late last year, Khan had stirred a controversy after he expressed "alarm and despondency" over rising instances of intolerance in the country in the past few months and said that his wife, Kiran Rao, had even asked if they should move out of India as she feared for the safety of their children. Senior bureaucrat Amitabh Kant justified the removal by saying that terming India an 'intolerant country', worked against his role as that of a brand ambassador. "A brand ambassador promotes a brand. People will come to India and tourist flow will increase only if the brand ambassador of 'Incredible India' promotes the country as 'incredible', but if the brand ambassador says India is intolerant, he surely is not working as brand ambassador," Kant explained.

Sukanya Samridhi Yojana under BBBP campaign launched

P M Narendra Modi on 22 January 2015 launched a small deposit scheme Sukanya Samridhi Yojana for girl child under the Beti Bachao Beti Padhao (BBBP) campaign. The scheme ensures equitable share to a girl child in resources and savings of a family in which she is generally discriminated against a male child. The scheme will enable parents to open bank accounts of girls who are under 10 years of age and will fetch an interest rate of 9.1 percent and provide income tax rebate.

World Bank releases report on Social Inclusion and Sustainable Development

World Bank released a report on 28 January 2015 under the title 'Scaling the Heights: Social Inclusion and Sustainable Development' in Himachal Pradesh. It is a macro-social account of the state's achievements over the past several decades. It is also an interdisciplinary attempt to understand the confluence of factors that allowed the state to move toward social inclusion and sustainable development.

Anti-Leprosy Day observed

Anti-Leprosy Day was observed on 30 January 2015 across the country to focus attention on the disease. On this occasion President extended his best wishes to the Indian Leprosy Association. The day is celebrated in the memory of Mahatma Gandhi to re-memorize his selfless efforts and care for the people affected by the infectious disease leprosy.

India test-fires Agni-5 missile

India on 31 January 2015 successfully test-fired indigenously developed canister-based inter-continental ballistic missile (ICBM) Agni-5 from Wheeler's Island off Odisha coast. Agni-5 is a surface-to-surface nuclear capable missile and is a three stage solid propellant missile with strike range of over 5000 kilometre and capable of carrying nuclear warhead of over one tonne.

K. N Tripathi sworn in as governor of Mizoram

K.N tripathi, 80, governor of Bihar and West Bengal was sworn in as the 16th governor of Mizoram on 4th April 2015. Tripathi replaces Aziz Qureshi, who was sacked prematurely. Qureshi's term would have ended in 2017. K.N Tripathi was a lawyer in Allahabad High court from 1956 till 2014. He was also a speaker of the Uttar Pradesh assembly in 1991, 1997 and 2002.

The Prevention of Corruption Act, 1988 amended

The union Cabinet on 30th April, 2015 approved the proposal to bring corruption under heinous crime category. The proposed amendment act will ensure speedy trial on corruption cases, limited to only two years. The proposal includes penal provisions being extended from six months to three years and from maximum five years to seven years.

The Rights of Transgender Persons Bill, 2014

On 25th April 2015, a private member's Bill protecting and providing rights for transgenders

was passed by the Rajya Sabha. The Bill guarantees reservation in education and jobs, financial aid and social inclusion for transgenders. As many as 29 nations and leading democracies in the world including US, UK, Canada, France, Australia, Italy and Singapore have legislations protecting rights of transgender persons.

Sania Mirza becomes first Indian female ranked World No.1 in Women's Doubles

On 12th April 2015, Sania Mirza created history by becoming the first female tennis player from India to achieve the world number one rank in doubles. She also won the WTA Family Circle Cup with partner Martina Hingis, Charleston. The top Indo-Swiss pair beat Casey Dellacqua and Darija Jurak with score (6-0) (6-4) in just 57 minutes in the lop-sided final.

Government launches 'Give it up' movement

On 4th April 2015, Union Minister of State for Petroleum and Natural Gas Dharmendra Pradhan launched the "give it up" movement. The movement appeals the rich people to give up their subsidy amount given on liquefied petroleum gas (LPG) cylinders. The money saved in this process may be used to provide LPG connections in rural areas where people still use firewood for cooking.

Pedro Bellido appointed as PM of Peru

On 2nd April 2015 Pedro Cateriano Bellido was appointed as the seventh Prime minister of Peru by President Ollanta Humala in a ceremony which took place in Lima, Peru. He replaced Anna Jara who was sacked after losing the vote of confidence in Congress on 30th March 2015. Bellido was the member of parliament of Peru 1990-1992 and served as deputy Justice Minister from 2001 to 2002.

Nasim Zaidi appointed as chief election commissioner

Dr. Nasim Zaidi, the senior most election commissioner was appointed as the Chief Election Commissioner (CEC) of India by President Pranab Mukharjee on 9th April 2015. The former CEC Hari Shankar Bramha retired on 18th April. Zaidi will have a tenure till 2017, until he turns 65. Zaidi has previously worked in the Civil Aviation Ministry being a 1976 batch IAS officer.

7.8 magnitude earthquake struck Nepal

A 7.8 magnitude earthquake struck Nepal on April 25, 2015 which damaged several buildings in the country's capital Kathamandu. Death toll rose up to 4,800. The epicenter of the earthquake was located about 50 mi (80 km) northwest of Kathmandu. More than 6.6 million people in the area were affected by the earthquake.

Jnanpith Award conferred on Marathi litterateur Bhalchandra Nemade

The 50th Jnanpith Award was given to eminent Marathi litterateur Bhalchandra Nemade whose several books, including Kosala and Hindu

have influenced Indian writing. Seventy-six-year-old Nemade hails from Jalgaon. As a critic, Nemade's contribution rests on initiating Deshivad, a theory of nativism that negated globalisation, asserting the value of a writer's native heritage, and language.

Amravathi- new capital of Andhra Pradesh

The historical region of Amravati has been declared as the capital city of Andhra Pradesh by chief minister N. Chandrababu Naidu. It is located on the bank of river Krishna in the Guntur district of Andhra. Now the Government is planning to develop Amravati into a more modern and cyber advanced place.

Dr. Mayilsamy Annadura takes over as director of ISRO

After the retirement of Dr. S.K Shivakumar, on 1st April 2015 Dr. Mayilsamy Annadura replaced him as director of ISRO satellite centre (ISAC). As the director of the centre, he will now look after the developments of satellite technology and implementation of satellite systems for scientific, technological and application missions.

India to host SAARC meeting for health ministers

The 5th meeting of the SAARC Health Ministers was hosted at New Delhi on 8 April, 2015. The meeting was chaired by Shri J. P. Nadda, Union Minister of Health & Family Welfare. About 50 delegates from all SAARC countries, including India, comprising officials and experts participated in the technical and official level meetings.

Canada to Supply Uranium to India

On 15th April 2015, Canada agreed to supply 3,000 metric tonnes of uranium to India from this year under a $254 million five-year deal to power Indian atomic reactors. The agreement for Uranium supply came two years after protracted negotiations following the 2013 civil nuclear deal between India and Canada. It was signed after comprehensive talks between PM Narendra Modi and his Canadian counterpart Stephen Harper.

Gulshan Rai as India's first cyber security chief

Concerned about the increased cyber threats in India, Prime Minister Narendra Modi appointed Mr. Gulshan Rai as India's first cyber security chief under the Prime Minister's Office. Rai has over 25 years of experience in different areas of Information Technology, which includes cyber security, e-governance, legal framework and the Information Technology act for e commerce and other cyber related works.

India test-fires Agni-III

On 16th April 2015 India successfully test-fired its nuclear-capable Agni-III ballistic missile with a strike range of more than 3,000 km from Wheeler Island off Odisha coast. The indigenously developed surface-to-surface missile was test-fired from a mobile launcher at launch complex-4 of the Integrated Test Range (ITR) at Wheeler Island by army at about 0955 hrs.

India and France begin naval exercises

India and France on 23rd April 2015 began 10-day naval exercise 'Varuna' that will see 12 Rafale fighter jets in action off the Goa coast along with a host of naval assets of both countries. The 14th edition of "Varuna" started in Goa with the arrival of four French Naval ships, including aircraft carrier Charles de Gaulle, two destroyers Chevalier Paul and Jean de Vienne, replenishment tanker Meuse and a maritime patrol aircraft Atlantique 2.

India to chair 9th International Renewable Energy Agency council meet

The 9th International Renewable Energy Agency (IRENA) council meeting was held in Abu Dhabi, United Arab Emirate (UAE) and chaired by India. The 9th IRENA meeting was starting from 10th June 2015 and was a two days event. 21 member nations of IRENA participated in the meet. IRENA is an intergovernmental organization that promotes adoption and sustainable use of renewable energy.

Indian Railways launches E-Samiksha

Indian Railways on 21st April launched E-Samiksha, an online monitoring mechanism. The software is designed by NIC and is currently being used by Cabinet Secretariat, PMO and other Ministries for monitoring progress implementation of various programmes and follow-up of meetings. The main objective of this software is to monitor the progress of every project whether small or big.

Lewis Hamilton wins Bahrain Grand Prix

Lewis Hamilton won the Bahrain Grand Prix of Formula One on 19th April 2015.This is his third win in four races, extending his lead in the championship to 27 points over his Mercedes teammate Nico Rosberg. He had beaten Rosberg, a specialist in Bahrain, in the qualifying and final race. In the championship standings, Hamilton now has 93 points to Rosberg's 66.

INS Visakhapatnam launched

The Indian Navy on 20th April 2015 launched the stealth destroyer INS Visakhapatnam at Mumbai's Mazagon dock. INS Visakhapatnam is the first of P15-B stealth destroyers. The 163 m long ship, which will be propelled by four gas turbines, is designed to achieve a speed of over 30 knots at a displacement of approx 7300 tons.

ISRO tests indigenous cryogenic engine

Indian space Research Organisation (ISRO) successfully tested the powerful version of the cryogenic engine on 28th April, 2015. The test was conducted at ISRO propulsion complex at Mahendragiri in Tamil Nadu. This engine can carry a satellite of up to four tonnes in geostationary orbit. The engine provides excess of thrust for every kilogram of propellant burnt.

India, Japan ink action agenda to boost trade

Japan and India have signed a five point action agenda on 30th April, 2015 to support PM Narendra Modi's 'Make in India' initiative. This move would increase bilateral trade and investment between the two countries. The action agenda was signed between Japan's minister for Economy, Trade and Industry Miyazawa and India's commerce and industry minister Nirmala Sitharaman.

Loretta Lynch as first black female Attorney General

On 27th April 2015, Loretta Lynch was sworn in as the new U.S. attorney general, replacing Eric Holder. She is the first African- American woman to serve in the role. Lynch has graduated from Harvard and grew up in North Carolina during the civil rights movement in 1960s. Her nomination held up more than five months over politicking in the Senate.

Mohammed bin Nayef appointed as Crown Prince of SA

Saudi king Salman bin Abdulaziz appointed his nephew, Deputy Crown Prince Mohammed bin Nayef as the new heir apparent on 29th April, 2015. The King replaced his half brother with Mohammed bin Nayef. The new crown prince has been the interior minister since 2012 and was the head of the kingdom's security forces for a decade earlier.

Muhammadu Buhari elected as president of Nigeria

Muhammad Buhari, 72, has been elected as the president of Nigeria in March 2015, after being defeated two times in earlier elections. Formerly a military leader and politician, he served as the head of the state in 1984-85. After losing thrice, in 2003, 2007 and 2011, he contested again in 2014 from All Progressive Congress party and finally won in 2015.

New Zealand wins Sultan Azlan Shah Hockey Tournament 2015

The 24th Sultan Azlan Shah Hockey Tournament held in Malaysia was won by New Zealand. New Zealand beat Australia in the Shoot out stages with score 3-1. The two teams were locked at 2-2 at the end of full time. It was the second win for team New Zealand, the first one being in the year 2012 against Argentina.

Odisha Government launches "aahar scheme"

On 1st April 2015, Odisha government took a major step towards feeding the poor by launching the "aahar scheme" on the occasion of State's foundation day. The program aims at providing a meal consisting of rice and dalma at Rs. Five to the urban poor. The Chief Minister, Shri Naveen Patnaik launched the scheme in two towns, Bhubaneshwar and Rourkela.

Parliament passes Payments and Settlement Bill, 2014

On 28th April 2015, Parliament passed Payments and Settlement Bill, 2014. The bill seeks to amend

the Payment and Settlement Systems Act, 2007. It aims at addressing the problem of insolvency in the payment and settlement system by increasing transparency and stability in it. The amendment seeks to protect funds collected from the customers by the payment system providers and to extend the Act to cover trade repository and legal entity identifier issuer.

Shashi Kapoor conferred with Dadasaheb Phalke award

Veteran actor-producer Shashi Kapoor was conferred on May 10 with prestigious Dada Saheb Phalke Award for 2014. The Dadasaheb Phalke Award is India's highest award in cinema. He is the 46th winner of the honour, awarded by the government for his outstanding contribution for the growth and development of Indian Cinema.

PM Narendra Modi launches MUDRA bank

On 8th August 2015 Prime Minister Narendra Modi launched Micro Units Development Re-finance Agency (MUDRA) bank in New Delhi. The bank will provide credit up to Rs 10 lakhs to small entrepreneurs and act as a regulator for "Micro Finance Institutions" (MFI's) involved in manufacturing, trading and service activities to promote their growth.

India's first dedicated satellite ASTROSAT launched

India's first dedicated satellite for astronomical research, Astrosat, has been launched on 28th September from here at 10am. The Polar Satellite Launch Vehicle PSLV-C30 carried it into a low earth equatorial orbit after its take-off from the first launch pad of Satish Dhawan Space Centre, along with six small satellites of international customers.

Nepal's Parliament Passes New Constitution

Nepal's parliament passed a new national constitution on September 17, weeks after political leaders reached a historic agreement to create a federal state. The long-delayed bill was passed after violent protests that had killed more than 40 people and shut down large swathes of the south. In all, 507 of the young republic's 598 lawmakers came out in favour of the bill in the marathon vote.

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

The Cabinet Committee on Economic Affairs (CCEA), chaired by the PM Narender Modi, has given its approval to the scheme the " Pradhan Mantri Krishi Sinchayee Yojana" (PMKSY). The aim of the PMKSY is to achieve convergence of investment in irrigation at the field level, expand cultivable area under assured irrigation, improve on-farm water usage efficiency to reduce wastage of water, enhance the adoption of precision- in irrigation and other water saving technologies.

BRICS banks operationalise Contingent Reserve Arrangement

The Central Banks of Brazil, Russia, India, China and South

Africa signed Mutual Assistance Agreement (MAA) to operationalise the Contingent Reserve arrangement (CRA) of 100 billion US dollars. The Agreement was signed after meeting the BRICS finance ministers and Central Bank governors in the Russian capital Moscow.

Government approves amendments to Payment of Bonus Act 1965

The Union Cabinet on 21 October 2015 approved amendment in the Payment of Bonus Act 1965 for the Industrial workers. According to the amendment, the bonus ceiling under the legislation has been increased from 3500 rupees to 7000 rupees per month. The wage ceiling for getting bonus has also been increased from existing 10000 rupees per month to 21000 rupees per month.

India's GSAT-15 Satellite Launched

On November 11, 2015, India's latest communication satellite GSAT-15 was successfully launched by the European Ariane-5 VA-227 launch vehicle. It is a high power satellite being inducted into the INSAT/GSAT system. The launch GSAT 15 will enable ISRO to provide continuity of service to Indian users in Ku Band. GSAT-15 carries a total of 24 communication transponders in Ku-band beacon as well to help in accurately pointing ground antennas towards the satellite.

7th Pay Commission submits its report

The 7th Central Pay Commission (CPC) headed by Justice AK Mathur submitted its report on 19 November 2015. The commission recommended 23.55 percent hike in pay and allowances of government employees. As per report, the minimum pay for government employees is to be set at 18000 rupees per month. The maximum pay is to be 225000 rupees per month for Apex Scale and 250000 per month for Cabinet Secretary and others presently at the same pay level. The recommended pay revision will come into effect from 1 January 2016.

India test-fires Nuclear Capable Agni-IV

India successfully test-fired a Nuclear Capable Agni-IV on 9th November, 2015 from APJ Abdul Kalam Island. The missile has a maximum range of 2,500 miles and is capable of carrying a payload of approximately 2,200. Agni IV is equipped with modern and advanced ring laser gyro-based inertial navigation system (RINS) and supported by reliable redundant micro navigation system (MINGS) which gives it two digit accuracy.

Pia Alonzo Wurtzbach crowned Miss Universe 2015

Miss Philippines Pia Alonzo Wurtzbach was on 20 December 2015 crowned Miss Universe 2015 at the final of 64th edition of Miss Universe held in Las Vegas, the USA.She was crowned by Miss Universe 2014 winner Paulina Vega of Columbia.

Pia Alonzo Wurtzbach, a Filipino-German actress, and model, finished her secondary education

with the ABS-CBN Distance Learning Center and studied culinary arts at the Center for Asian Culinary Studies in Metro Manila, Philippines. When she was 11, she worked as an actressunder the screen name Pia Romero. She is presently a stylist and writer for the lifestyle section of a leading newspaper in the Philippines.

25 December: Good Governance Day

To mark the birth anniversary of former Prime Minister Atal Bihari Vajpayee, Good Governance Day was observed on 25 December 2015 across the country. To mark the occasion, four new IT-based initiatives for providing citizen-centric health services were announced. The initiatives include three applications namely Kilkari, Mobile Academy and M-Cessation and a dedicated toll free number 1800-11–6666 to provide round the clock support for counselling and treatment support services for TB patients.

LRSAM test-fired

Long Range Surface-to-Air Missile (LRSAM), the missile co-developed by India and Israel was on 30 December 2015 successfully test-fired from the Western Sea Board. The missile was fired from INS Kolkata and it successfully intercepted an aerial target at extended ranges. The test-fire was jointly carried out by the Indian Navy, Defence Research and Development Organisation (DRDO) and Israel Aerospace Industries.

Government approves Pradhan Mantri Fasal Bima Yojana

The government on 13 January 2016 approved the New Crop Insurance Scheme, 'Pradhan Mantri Fasal Bima Yojana' to boost the agricultural sector. The theme of the Scheme is One Nation – One Scheme. With it, all shortcomings and weaknesses of all earlier schemes were removed and incorporated with the best features of all schemes.

World Hindi Day observed

The 11th World Hindi Day was observed on 10 January 2016. To mark the occasion, Ministry of External Affairs through its missions abroad and the Department of Official Language (Rajbhasha) conducted special events to spread the greatness of the language. National Hindi Divas is celebrated to mark the day, 14 September 1949, on which the Constituent Assembly adopted Hindi written in Devanagari script as the Official Language of the Union.

DRDO test-fires anti-tank missile Nag

The Defence Research and Development Organisation (DRDO) in January 2016 successfully test-fired Nag anti-tank missile at the Mahajan Field Firing Range in Rajasthan. The test was carried out during a night trial to validate the enhanced 4-km range capability of Imaging-Infrared seeker, which guides the missile to the target after its launch. The Thermal Target System (TTS) was used as target for the missile during the test.

Raghuram Rajan conferred Central Banker of the Year Award

The Reserve Bank of India Governor Raghuram Rajan on 7 January 2016 was conferred with the Central Banker of the Year Award (Global and Asia Pacific) for 2016. The Financial Times Group's monthly publication The Banker gave away the award. The Central Banker of the Year 2016 awards are conferred on those that have best managed to stimulate growth and stabilise their country's economy.

The 2016 United States elections

The US 2016 elections will last five months, beginning with the Iowa caucuses and New Hampshire primary, running through two Super Tuesdays, and ending with the Democratic and Republican conventions, when the parties will officially unveil their nominees. The United States elections are to be held on November 8, 2016.

In this presidential election, the President of the United States and Vice President will be elected. Besides, elections will also be conducted for all 435 voting-member seats in the United States House of Representatives (as well as all 6 non-voting delegate seats) and 34 of the 100 seats in the United States Senate. Twelve state governorships, two territorial governorships, and numerous other state and local elections will also be contested. The incumbent president, Democrat Barack Obama, is ineligible to be elected to a third term due to term limits established by the Twenty-second Amendment to the United States Constitution. There are numerous potential candidates in the Republican Party, Democratic Party, and among third parties.

IDEAS

NITI Aayog replaces Planning Commission

The Government on 1 January 2015 set up the National Institution for Transforming India (NITI) Aayog. NITI Aayog replacing the Planning Commission will be headed by Prime Minister. It will have a governing council comprising Chief Ministers of all the states and Lt. Governors of Union Territories.

Besides, the NITI Aayog will also have a Vice-Chairperson and a Chief Executive Officer (fixed tenure, in the rank of Secretary to the Government of India) to be appointed by the PM.

RBI cuts Repo Rate

The Reserve Bank of India (RBI) announced sixth Bi-Monthly Monetary Policy Statement on 15 January 2015. The main lending rate (Repo Rate) in the bi-monthly monetary policy statement was cut by 0.25 per cent with immediate effect. This is the first rate cut from the RBI since 2013. Now repo rate will prevail at 7.75 percent from previous 8 percent. Currently, RBI keeps repo rate unchanged at 6.75% growth protection at 7.4% in line.

Idukki becomes first District to have Complete Rural Broadband Coverage

Union government on 12 January 2015 linked Idukki district in Kerala to the National Optic Fiber Network (NOFN). The district was linked to the NOFN as part of the Digital India project of the centre.

Idukki district will now become first district of India to have complete rural broadband coverage.

As part of it, 8 Block Offices & 52 Gram Panchayats of the Idukki district were connected on Optical Fiber and one Gram Panchayat, Edamalakudy, was connected through VSAT (Very Small Aperture Terminal).

India's first CNG powered train inaugurated

Union Minister for Railways Suresh Prabhu on 13 January 2015 inaugurated India's first compressed natural gas (CNG)-powered train on the Rewari-Rohtak link of Northern Zone. This is a milestone in adoption of green fuel in Indian Railways which will help reduce greenhouse gas emission and also the consumption of diesel.

Pradhan Mantri Jan Dhan Yojna enters Guinness World Records

Pradhan Mantri Jan Dhan Yojna(PMJDY) entered Guinness Book of World Records on 20 January 2015.

Indian Banks opened 11.50 crore accounts under the Pradhan Mantri Jan Dhan Yojana in a period of five months. The feat was commended by the Guinness Book of World Records. Of the total account opened, 5.68 crore accounts belonged to male and 5.82 crore account belonged to females.

Digital Village Project launched

The ICICI Bank on 2 January 2015 launched Digital Village Project in Akodara Village of Gujarat.

The project aimed to provide services ranging from cashless banking to digitised school teaching. With the digital village having three themes i.e. cashless, comprehensive and connected, the project embarked the 60 year celebration of the ICICI group's existence since the erstwhile ICICI Ltd was set up in 1955.

National Conference on e-Governance held

18th National Conference on e-Governance was held in Gujarat from 30 January 2015 to 31 January 2015. With the main Theme of the Conference as Digital Governance – New Frontiers, the focus sector was Skill Development and Employability. The conference was organised jointly by Department of Administrative Reforms & Public Grievances (DARPG) and Information Technology (DeitY).

e-Raksha launched to fight cybercrime

Gujarat Technological University (GTU) on 28 January 2015 launched e-Raksha Research Centre to fight cybercrime. The centre was launched to curb rising cybercrimes. The union government will encourage research and enhance capability to provide solution for issues related to

cyber security. The research centre will train students in areas of cyber security and enhance their capability to provide solution for issues related with cyber security.

Government launched Green Highways Policy, 2015

Union Minister of Road Transport & Highways and Shipping Shri Nitin Gadkari on September 29 launched the Green Highways (Plantation, Transplantation, Beautification & Maintenance) Policy, 2015. The aim of the policy is to promote greening of Highway corridors with participation of the community, farmers, private sector, NGOs, and government institutions.

Swadhar Greh scheme for women in distress

The Haryana Government approved Swadhar Greh scheme on 18 October 2015 which will assure economic and social security to women in distress. The scheme aims at creating a supportive institutional framework catering to their primary needs in difficult situations. It will also work upon providing basic amenities, such as shelter, food, clothing and health along with economic and social security to women in distress.

Hangzhou City chosen to host 2022 Asian Games

The eastern Chinese city of Hangzhou was on 16 September chosen by the Olympic Council of Asia (OCA) to host the 2022 Asian Games. Hangzhou was the only candidate city for the 2022 Asian Games. Its successful bid means the regional games will be staged in China for the third time following Beijing in 1990 and southern Guangzhou in 2010.

Gold Monetisation Scheme 2015 launched

The Reserve Bank of India issued a Direction on 22 October 2015 to all Scheduled Commercial Banks (excluding Regional Rural Banks) on implementation of the Gold Monetisation Scheme, 2015 notified by the Union Government. Resident Indians (Individuals, HUF, Trusts) can make deposits under the scheme. The minimum deposit at any one time shall be raw gold (bars, coins, jewellery excluding stones and other metals) equivalent to 30 grams of gold of 995 fineness.

Andhra Pradesh signs memorandums with Japan for development of the State

Government of Andhra Pradesh on 22 October 2015 signed a MoC for development of economic infrastructure and a MoU to develop Amaravati with the Government of Japan. The memorandums were signed on the heels of foundation stone laying ceremony of Amaravati, the new capital of Andhra Pradesh.

China to build world's largest animal cloning factory

Chinese scientists unveiled their plan to develop the world's largest animal cloning factory in November 2015. It will be built to save critically endangered species from extinction. The company will mainly focus at cloning cattle, which would help China to keep up with Chinese demand of the meat. It is likely to produce around one lakh cow embryos annually, which would be

five percent of the Chinese market for beef.

Rajasthan, South Australia sign Sister-State Agreement

Rajasthan and South Australia on 20 November 2015 have inked the historic Sister-State Agreement to boost export and investment opportunities between the two states. The sister-state relationship between South Australia and Rajasthan is based on a two-way exchange of research, policy and technical capabilities. The agreement facilitates partnership opportunities across key sectors where South Australian business will offer services and product support.

Government launches Mobile Apps for farmers

The Union government on 23 December 2015 launched two mobile apps namely Crop Insurance and AgriMarket Mobile for the benefit of farmers. The Mobile app Crop Insurance will help the farmers not only to find out complete details about insurance cover available in their area but also to calculate the insurance premium for notified crops, coverage amount and loan amount in case of a loaned farmer.

IUPAC announces addition of Four Elements to complete Seventh row of Periodic Table

The International Union of Pure and Applied Chemistry (IUPAC) on 30 December 2015 announced discovery and assignment of elements with atomic numbers 113, 115, 117 and 118. The decision was taken by the IUPAC as the four elements met the discovery of elements of the IUPAP/IUPAC Transfermium Working Group (TWG) 1991 Discovery Criteria.

India saved 1 billion US dollars annually using Aadhaar

The World Bank on 14 January 2016 announced that India saved 1 billion US dollars annually by using Aadhaar. As per the report, transfer of fuel subsidy to bank accounts using the Aadhaar-based Direct Benefit Transfer (DBT) saved about 1 billion per year when applied throughout the country. The DBT has the potential to save over 11 billion US dollars per year in government expenditure if the scheme is expanded to other subsidy programmes.

SBI launches India's first start-up branch SBI InCube

State Bank of India on 14 January 2016 launched India's first start-up focused bank branch called SBI InCube in Bangalore, Karnataka. The specialized branch aims to understand and address banking needs of a Start-up Business. It also launched the wealth management service SBI Exclusif, which is targeted at the fast-growing affluent segment in the country.

Startup India, Standup India unveiled

Prime Minister Narendra Modi unveiled the Startup Action Plan on 16 January 2016, at the launch

event of Startup India, Standup India. The event was held at Vigyan Bhawan, New Delhi. Organised by Department of Industrial Policy and Promotion (DIPP), along with other key Indian startup ecosystem players, the Startup India, Standup India initiative aims to celebrate the country's entrepreneurial spirit, and create a strong ecosystem for fostering innovation and startups in India.

ISSUES

DDCA controversy

The battle over alleged financial irregularities in the Delhi and District Cricket Association (DDCA) between AAP and BJP has not died down; the issue has now reached the Parliament. Both Delhi Chief Minister Arvind Kejriwal and union Finance Minister Arun Jaitley, engaged into war of words making allegations and counter-allegations over one another. Interestingly, the Delhi government report on the matter didn't even name him for pinning irregularities in the DDCA. The BJP demanded a public apology from the Aam Aami Party for making false allegations.

According to reports, the Serious Fraud Investigation Office (SFIO) found 23 instances of alleged huge financial bunglings of the DDCA between 2006 and 2012. These include misappropriation of funds, non-payment of taxes, not following the tendering route, hiring of tainted auditors and irregularities concerning management of membership, ticketing, construction of corporate boxes without prior approval of authorities and others. While the Delhi government inquiry report does not mention the name of Arun Jaitley, who has been under the scrutiny over alleged irregularities during his tenure as its chief for 13 years till 2013, the 237-page document does recommend that considering the 'large number of allegations against DDCA', the cricket body should be immediately suspended by the BCCI.

Sunanda Pushkar death

It has been over two years since Sunanda Pushkar, wife of Congress MP Shashi Tharoor was found dead in a five-star hotel in Delhi. Considering her death and its circumstances, it would be obvious to believe that Mrs Tharoor died of an unnatural cause. What everybody is keen to know is this: Was she killed? And, if yes, by whom and why? Delhi Police recently received the AIIMS medical board's 'advice' on the FBI lab report on viscera samples of Sunanda Pushkar to identify the cause of her death.

Sunanda was found dead inside her suite at a five-star hotel in January 2014, a day after she was involved in a spat with Pakistani journalist Mehr Tarar on Twitter over the latter's alleged affair with her husband Tharoor. Her viscera samples were

sent to the FBI lab in Washington DC in February last year to determine the kind of poison that killed her after an AIIMS medical board identified poisoning as the reason behind her death but did not mention any specific substance. In the latest developments, the medical board, which analysed the findings of the Federal Bureau of Investigation (FBI) on Pushkar's viscera samples, submitted its fourth subsequent opinion to the SIT on January 12 stating that she died of poisoning due to an overdose of the anti-anxiety drug Alprax.

Aamir Khan joins 'intolerance' debate

Actor Aamir Khan, one of Bollywood's leading men, in November last has reopened a debate about tolerance and free expression in India saying his wife Kiran Rao had asked if they should move out of the country, as she feared for the safety of their children in a climate of insecurity, prompting a torrent of criticism on social media. At the Ramnath Goenka Awards function of The Indian Express Group, Khan said there was an increased sense of despondency over the past 6-8 months and that he was alarmed by it.

Aamir Khan also backed writers and intellectuals who had returned their awards following the Dadri lynching and the murder of rationalists. On social media, Khan's comments reinvigorated the debate about tolerance and free expression that had dominated media coverage in India for weeks though now died down. It is recalled that Aamir Khan had promoted Indian tourism for a decade as the brand ambassador of 'Incredible India.'

Report titled World Employment and Social Outlook – Trends 2015 released

International Labour Organisation (ILO) released a report titled World Employment and Social Outlook – Trends 2015 (WESO) on 20 January 2015. According to the report, more than 212 million people will be out of work by 2019, up from the current 201 million. The report also warned that unemployment will continue to rise in the coming years, as the global economy has entered a new period combining slower growth, widening inequalities and turbulence.

National Girl Child Day observed

National Girl Child Day is observed on 24 January 2015 across the country. The observance was started to offer more supports and new opportunities to the girls in the country. It is celebrated to increase the awareness among people about all the inequalities faced by the girl child in the society. This day is being observed every year on 24 January since 2008.

India to become most populous nation by 2022

China is the most populous country of the world. It has approximately 1.38 billion population. UN has

released the report on 29th July 2015 named "World Population Prospectus: The 2015 Revision" at the UN Headquarters in New York which says that, India will soon surpass China's Population. India and China covers around 18% and 19% of the world's population respectively.

Law Commission submits report on Death Penalty

The Law Commission of India on 31 August submitted its 272-page draft report on the Death penalty to the Union Government. The report favours speedy abolition of the death penalty from the statute books, except in cases where the accused is convicted of involvement in a terror case or waging war against the nation.

21st International Day for the Preservation of the Ozone Layer

The UN General Assembly in 1994 proclaimed 16th September as the International Day for the Preservation of the Ozone Layer to commemorate the date of the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. The theme and the slogan for the year 2015 are '30 Years of Healing the Ozone Together' and 'Ozone: All there is between you and UV' respectively.

Global Terrorism Index 2015 released

Institute for Economics and Peace Institute for Economics and Peace (IEP) on 17 November 2015 released Global Terrorism Index 2015. As per the report, deaths from terrorism increased 80 percent in 2014 to the highest level ever. Out of the 162 countries, India was the sixth most affected by terrorism in 2014. The top 5 countries that were worst effected by terrorism in 2014 - Iraq, Afghanistan, Nigeria, Pakistan and Syria.

Supreme Court upheld Haryana Panchayati Raj (Amendment) Act, 2015

The Supreme Court on 10 December 2015 upheld Haryana Government's amendment to the Haryana Panchayati Raj (Amendment) Act, 2015. The Act mandates educational qualifications and other eligibility criteria for candidates who aspire to contest the rural local body elections. The Act fixes matriculation as minimum educational qualification for elections to Panchayati Raj Institutions (PRIs).

Delhi Government announces odd-even scheme

Delhi Government on 4 December 2015 announced odd-even scheme to curb air pollution in the city. The primary objective of the initiative is to halve the vehicular population in the city and to bring pollution levels under control. In the first phase of the scheme, vehicles with odd and even number plates would be allowed to run on alternate days between 1 January and 15 January 2016 in the capital city.

Rajya Sabha passes Juvenile Justice (Care and Protection of Children) Bill, 2015

Rajya Sabha on 22 December 2015 passed the Juvenile Justice (Care and Protection of Children) Bill, 2015. It was already passed by the Lok Sabha on 7 May 2015. The Bill permits juveniles between the ages of 16-18 years to be tried as adults for heinous offences. Also, any 16-18 year old, who commits a lesser (serious) offence, may be tried as an adult only if he is apprehended after the age of 21 years.

Falling Oil Prices

Global oil prices have fallen sharply over the past seven months, leading to significant revenue shortfalls in many energy exporting nations, while consumers in many importing countries are likely to have to pay less. The prices have fallen almost 20 per cent since the start of the year, dragged by supply cut and worries about a slowdown in global growth led by China.

However, a fall in crude prices is good for a net importer country like India, which imports oil to the extent of 80 per cent of the total requirement. Crude oil price is a major component of the import bill. With the falling price the average price will go down, the government will save a lot, strengthening fiscal position, cut down inflations and bring down cost of commodities.

Devaluation of Chinese Yuan

With the Chinese stock market is in turmoil, the government of China devalued its currency for the second time in less than six months. The impact of stock market tumbling in Shanghai has been felt all over the world. It is bound to affect the exports of several major countries. Recently Yuan was placed into the IMF's group of elite global currencies.

Yuan's slide suggests the world's second-largest economy and one of biggest markets for many global companies is in trouble. Decade long slowdown could impact the earnings of global corporates. Devaluation gains an advantage for China in global trade. Its exports become cheaper, and more attractive, to foreign buyers. To stay competitive against China, its trade partners – mostly in Asia – devalue as well to maintain a cheaper currency. A weaker Yuan is feared to drive the global economy closer to a recession. Following Yuan's devaluation, a number of emerging market (EM) currencies, including the rupee, fell and their stock markets came under severe strain. The sharp fall in yuan has also raised fears of cheaper Chinese goods hurting the sales of domestically manufactured products in many countries. Many of the India's export sectors could be affected.

US Lifts Nuclear Sanctions on Iran

After the International Atomic Energy Agency (IAEA) confirmed that Iran has met its commitments under Vienna agreement with P5+1 countries signed in July 2015 the US

lifted some of the much needed bans on Iran. It can bring mixed results in the International and domestic surroundings so far the political and economic impacts are concerned.

The lifting of sanctions will enable Iran to once again be an active member of the international community and commence unrestricted trade and commerce. Iran has the fourth largest oil reserves in the world and now it will resume selling its oil in the international markets in cheap rates to attract its old customers. It may bring some imbalance in oil price and create financial chaos. It is being perceived by the Arab world, that strengthening of Iran's position in the region may result in an Iranian Shiite expansionism. India, traditionally has had good ties with Iran and with the global sanctions being lifted, it will be possible to engage more freely with Iran over various development projects, like the development of the Chabahar Port in Iran, where India, also intends to lease two berths for 10 years. It will also bring proposed India-Pakistan-Iran (IPI) gas pipeline closer to reality.

Iran-Saudi Conflict

The world should be worried about an open conflict between Iran and Saudi Arabia. Relations between Saudi Arabia and Iran -- two Middle Eastern powerhouses -- quickly deteriorated following Riyadh's execution of Shiite cleric Nimr al-Nimr. Saudi Arabia suspended all flights to and from Iran. It also sent a letter to the U.N. Security Council accusing Iranian authorities of failing in their duties to protect the Saudi embassy. The tensions of regional and sectarian conflicts are on the verge. Saudi, a predominantly Sunni kingdom, and Shia Iran have accused each other of backing proxies in the war in Yemen and Syria.

Parliament Disruption

Disrupting Parliament on personal and political grounds is a long tradition prevailing among the Indian politicians that speaks of the unethical and selfish behaviour of people's representatives.

Blocking of Parliament by Congress over the National Herald case is sad and such issues related to individuals are bringing down the entire system. The crucial Goods and Services Tax (GST) Bill is awaiting Rajya Sabha's approval for the landmark indirect tax arrangement to kick in from April 1, 2016. There is no platform in India, or even in the world, where proceedings are allowed to be disrupted in such a deplorable way. The members of Parliament are chosen by the people of this democratic nation to carry out the legislative business of the people. But the disruptions which have become a part of the parliamentary folklore are doing a great disservice by wasting valuable time and money of the nation. Disruptions tantamount to corruption as the interests and money of the people are put at stake in the fight between the ruling party and the opposition.

GST Bill: Time is Running Down

GST is expected to broaden the tax base, improve export competitiveness by removing several tax distortions and create a unified national market by removing inter-state barriers to trade. The resulting ease of doing business is expected to boost national income. A unified GST is an economically efficient solution even for the multinationals, which have to compete with the companies in the unorganised sector, as it simplifies the indirect tax structure to one general rate that can be paid by all companies. Under the GST structure, every company gets a deduction on the taxes already paid by its suppliers. That results in every buyer ensuring that his supplier has paid his part to claim his deductions. Chief Economic Advisor Dr Arvind Subramanian led Committee has recommended standard rate for Goods and Services Tax (GST) at 17 to 18 per cent.

The GST Bill's passage will require a constitutional amendment, which means a two-thirds majority was required in Parliament. The Assemblies too will have to approve the Bill ahead of the April 2016 deadline. As the Congress is the largest party in Rajya Sabha it requires a mutual consensus to pass the bill in the interest of the country.

OROP for Ex-servicemen

The One Rank, One Pension is a scheme that lays down that the retired soldiers of the same rank and length of service will receive the same pension, regardless of when they retire. The scheme was laid out in 2014, but has not been implemented yet due to some technical calculations and interpretations. Under OROP, a soldier who retired in 1995 would get the same amount of pension as the one who retired in 1996. The scheme will benefit ex-servicemen drawing pensions from the OROP scheme, especially those who retired before 2006 as at present, pensioners who retired before 2006 draw less pension than their counterparts and even their juniors. The scheme will benefit all three services- Air Force, Navy and Army. The NDA Government in its 2015 Budget announcement allotted 1000 crore rupees for the scheme.

Negotiable Instruments (Amendment) Bill, 2015

Rajya Sabha has passed the Negotiable Instrument (Amendment) Bill 2015 which amends the clauses relating to the territorial jurisdiction for filing Cheque dishonour Cases. It provides for filing of cheque bounce cases at the place where a cheque is presented for clearance and not the place of issue. It will amend the Negotiable Instruments Act, 1881 which defines bills of exchange, promissory notes, cheques and creates penalties for issues such as bouncing cheques.

The Act specifies circumstances under which complaints for cheque bouncing can be filed. The Bill amends the Act to state that cases

of bouncing of cheques can be filed only in a court in whose jurisdiction the bank branch of the payee (person who receives the cheque) lies. If a complaint against a person issuing a cheque has been filed in the court with the appropriate jurisdiction, then all subsequent complaints against that person will be filed in the same court, irrespective of the relevant jurisdiction area.

Dalit Student's Suicide in Hyderabad

Suicide of Hyderabad Central University's second-year PhD student of Life Sciences inside a hostel room sparked protests across the country and led to an FIR being filed against local BJP MP and Union Minister Bandaru Dattatreya under the SC/ST Act and on charges of abetment to suicide. Last August, the minister had written to the HRD ministry accusing the University of being "a mute spectator" after a group of Dalit students, including Rohith, clashed with an ABVP leader. Rohith was steadily isolated by campus authorities and his appeals — many of them anguished and sometimes cloaked in irony — went largely unheard. The University stopped paying Rohith his monthly stipend of Rs 25,000 and it also set up an inquiry against Rohith and four other ASA members, two days after they allegedly assaulted ABVP leader N Susheel Kumar. After a series of events, five students of Dalit community were suspended. After the sanction was confirmed, the five moved out of their hostel rooms to a tent they set up inside the campus and began a "relay hunger protest". The incident has taken a political turn as ABVP and Dalit leaders want to exploit the issue for political gain.

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