

Disclaimer

This learning module has been prepared as a learning tool to provide a description of the basic information related to General Knowledge compiled in an interesting format to make the subject easy and interesting especially for the school going kids who think the subject to be boring and exhaustive.

General Knowledge is a fascinating subject, there are so many amazing things to learn and discover. Thankfully you've got a lot of time to research, practice and feeling of various applications of computers in normal day to day life activities in surrounding!

Read on to find more while remembering that as society changes and technology develops so too does our understanding of various topics of General Knowledge and the world around us. What is 'fact' today may be disproved tomorrow.

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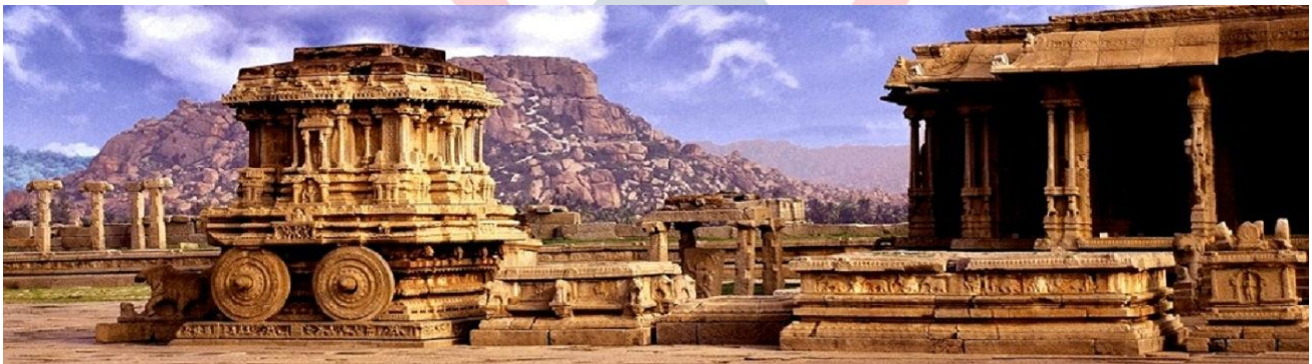
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HISTORY OF INDIA



ANCIENT INDIA –

- All the events of the past in a chronological description in order is called History.
- Father of History is **Herodotus (Greek)**; Book - **Historica**
- Those who study things that were made and used in the past these people are called Archaeologists.
- Father of Indian Archaeology: **Sir Alexander Cunningham**
- In ancient times Manuscript were written on palm leaves and on the bark of birch tree.
- Archive - An archive is a place where manuscripts and documents are stored.
- Scientific name of human: **Homo Sapiens or Wise Man** (coined by Carl Linnaeus in 1758)

- **BC** = Before Christ
- **AD** = Anno Domini (Latin Word- In the Year of Lord)
- BC is also known as BCE (Before Common Era) and BP (Before Present)
- AD is also called CE (Common Era) and P (Present)

The Nomenclature of India (Bharat Ka Namkaran) –

- India has been also called Bharat, Hindustan, Aryavarta and Jambudweep
- Hindustan name given by Persians (Iran Invaders). Due to wrong pronounce of River Indus (Sindhu)
- Bharat due to King Bharata (Son of Dushyant and Shakuntala)
- Aryavarta name due to invasion of Aryans. Jambudweep name due to Buddhist Literature.

Other Important Information –

- Numismatics is the study of Coins.
- Carbon Dating (C-14) is used to count the age of organic materials, things that were once living. Carbon-14 has a half-life of $5,730 \pm 40$ years (it is also known as Half-Life).
- Radio Carbon Dating or C-14 was discovered by Willard Libby in 1946.
- Earlier human was known as Primates or Aadi Manav (Human like Monkeys)
- Indira Gandhi National Human Museum (Rashtriya Manav Sangrahalaya) is located at Bhopal.

The Paleolithic age –

- Time Period – Unknown Time to 9000 BC.
- Uses of Fire starting in this age.
- Bhimbetka (Raisen Distt, M.P) has famous cave paintings of Paleolithic Age.
- No knowledge of Agriculture, Wheels etc.
- Stone was the main tool (Hand Axe).
- Men were hunters and gatherers.
- Homo Sapiens first appear in this age.

The Mesolithic age –

- Time Period – 9000 BC to 5000 BC.
- Animal domestication was started
- First animal tamed by Human was Dog. Later Sheep's and Goats also domesticated.
- Microlith tools used in this age.
- End of ice age during this period.

The Neolithic age –

- Time Period – 5000 BC to 2500 BC.
- Discovery of Wheel. Mesopotamia was 1st civilization that invented the Wheels.
- Agriculture and Farming evidence first found in this age.
- First grain used by human was Barley.
- Use of Pottery (World oldest Pottery Evidence found in Chopani Mando, UP)
- Dog buried with Human in Burzahom (J&K) and underground house also found here.
- Men started making houses.

The Chalcolithic age –

- The age of copper.
- First metal used by the human – Copper, 2nd metal was Bronze and 3rd metal was Iron.
- First village civilization established in this age.

Indus Valley civilization-IVC (Sindhu Ghati Sabhyata) –

- Also known as Harappa Civilization, Bronze Age Civilization, 1st Urban Civilization of the world.
- Time Period – 2500 BC – 1750 BC.
- First place discovered in this civilization was Harappa in 1921.
- Harappa, Mohenjo-Daro, Sutkagendor, Montgomery is presently situated in Pakistan.
- Famous for Town Planning and Drainage System. Agriculture was main occupation of Harappa Civilization.
- Northern Point- Manda (J&K), Southern Point- Daimabad (MH), Eastern point- Alamgir Pur (UP) Western Point- Sutkagendor (Baluchistan, Pakistan). Shape of IVC is Triangle.

Famous Places –

Harappa – Discovered by Rai Bahadur Dayaram Sahni on the instructions of Sir John Marshall in 1921.

- Located at the left bank of Ravi River, Montgomery Distt (Sahiwal), Punjab Province, Pakistan.
- Famous for six granaries on each side (Total 12 Granaries)

Mohenjo-Daro (Sindh Province, Pakistan) –

- Discovered by Rakhal Das (RD) Banerjee in 1922. Also known as the Mound of Dead. The Great Bath found here
- Priest King, Bronze Dancing Girl, Terracotta Mother Goddess and Pasupathi Seal (Proto Shiva).

Some more facts –

- Swastik Sign (卐) was found in Mohenjo-Daro. Lothal in Gujarat was famous for the Dockyard (Sea Port).
- Harappan Script is regarded as Pictographic or Boustrophedon (Fish was mostly used). It is not read yet.
- First to produce cotton in the world. Harappan were not aware of Iron, Temples, Horse and Lion.
- Trade – Barter system/ trade from Sumerian Civilization and Dilmun. Pasupathi Mahadev (Proto Shiva) was the chief deity.
- Ropar (Punjab), Kalibangan means Black Bengal's (Rajasthan)
- Dholavira and Lothal in Gujarat. Banawali, Bhagwanpur, and Rakhigarhi is in Haryana
- **Note:** Rakhigarhi is the largest Harappan site in Indus Valley Civilization.

The Vedic Age (1500 BC- 600 BC) –

- The term Veda means to know. Four Vedas were written during this period.
- **Rig Veda** – Oldest Religious Text of the world. Written around 1500 BC. Contains 10 Parts (Mandal's), 1028 Hymns.
- **Sama Veda** (Collection of Melodies or Book of Chants)- Origin of Indian Music.
- **Yajur Veda** (Book of Sacrifices)- Divided into two parts- Krishna & Shukla Veda.
- **Atharva Veda** (Book of Magical Formulae)- Evil and Disease discussed in this Veda.
- Indian medical science called Ayurveda, is originated from Atharva Veda.
- Gayatri mantra is taken from Rig Veda's 3rd Mandal, tribute to God Sun (Composed by Vishwaamitra)
- The 10th Mandal contains the famous **Purushasukta** hymn. Varna system first time discussed.
- First time **Shudra Varna** describe in **Purushasukta**.

Vedic Literature –

- Ashtadhyayi written by Panini – First Sanskrit grammar book
- Mahabhasya written by –Patanjali
- Upanishads – 108. Upanishads means “Be seated at the feet of the Guru”. Upanishad is also called **Vedanta**.
- Upanishads are books on Philosophy. These are written around 800 to 500 BC. It is written in Sanskrit language.
- Brihadaranyaka Upanishad provides the first reference of the idea of rebirth.
- **Satyameva Jayate** (National Motto of India) is taken from **Mundaka Upanishad**.
- Four Varnas – 1. Brahmin 2. Kshatriyas 3. Vaisyas 4. Shudras
- Four Asramas – 1. Brahmacharya (student life), 2. Grihastha (householder), 3. Vanaprastha (forest walker or dweller) 4. Sannyasa (renunciate or moksha).
- Puranas – 18. Oldest Purana is - Matsya Purana. Aranyaka (Forest Books) was written in the forest
- Aryans came from Central Asia (by Max Muller). Aryans (Indo-European tribe) destroyed Harappa Civilization.
- Rig Vedic people were pastoral. Cow was the most sacred
- The most important divinity in the Rig Veda is Indra or Purandara

Indian Epics –

- **Ramayana** – Written by Adi Kavi Valmiki. Ramayana has 24,000 lines in seven volumes (Kanda's).
- Valmiki is known as first poet of India and Ramayana is known as India's first poem (Adi Kavya)
- The story of Lord Rama mention in Ramayana. Lord Rama born at Ayodhya and he married with Sita at Janakpur.
- Sita Mata (wife of Lord Rama) born at Sita Kund, Sitamarhi district of Bihar. King Janaka found her while ploughing.
- Lord Rama Family– Father= Dashrath, Mother= Kausalya, Brother= Lakshmana, Bharata and Shatrughna.
- Lakshmana and Shatrughna Born from Sumitra. Bharata born from Kaikeyi.
- **Mahabharata** – Written by Ved Vyas. Lord Ganesh wrote Mahabharata with his teeth while Ved Vyas narrates it.
- Largest epic of the world. Original name of Mahabharata – Jaya Samhita
- Original 24000 verses, Present 100000 verses. Kauravas and Pandavas story mentioned in Mahabharata.
- Pandavas were five brothers – Yudhishtira, Bhima, Arjuna, Nakula and Sahadeva. Among them Yudhishtira was eldest.
- Kunti (Mother of Pandavas) has three sons – Yudhishtira, Bhima, Arjuna while Nakul & Sahadeva born from Madri.
- Kunti also conceived a son before marriage named Karna. Karna was son of Surya (God Sun).
- Kauravas were 100 brothers. Among them Duryodhana was eldest. Only one sister of Kauravas – Dussala
- Kauravas's father was Dhritarashtra (blind) and mother was Gandhari.
- Capital of Pandavas was Indraprastha (Delhi) and Capital of Kauravas Hastinapur (Near Meerut, UP)
- Mahabharat has 18 Parts (Parva). Mahabharat war fought for 18 days. Bhagwat Gita is mention in 6th Parva.
- **Note:** Ramayana and Mahabharata originally written in Sanskrit Language.

Mahajanapada – There were 16 large states in ancient India known as Mahajanapada.

- Famous Mahajanpada was- Kashi (Varanasi), Kosala, Anga, Vajji, Malla, Kuru, Panchal etc.

- Among them Magadha was most powerful and Fertile. Taxila University was the first university of the world.

Magadha Empire –

- Haryanka Dynasty– 1st dynasty ruled on Magadha, Founded by Bimbisara
- Bimbisara was contemporary of Gautam Buddha.
- Ajatashatru (Kunika) killed his father Bimbisara and become king of throne.
- Capital of Haryanka Dynasty– Earlier Rajgir (Girivraja), later – Patliputra.
- Founder of Patliputra – Udayin. Udayin was son of Ajatashatru. He also killed his father.
- Nanda Dynasty founded by– Mahapadmananda.
- Last Nanda ruler – Dhanananda (Alexander invading India during Dhanananda time)
- Magadha was first kingdom who used Elephants in battle.

Foreign Invasion –

- First Foreign Invader at India was – Darius-I (Persia, Iran) from Hakamani Dynasty.
- Alexander (Sikander), Greece (Unani) king invaded India in 326 BC.
- Alexander (Sikander) was the first European to invade Indian soil. Aristotle (Arastu) was the teacher of Alexander.
- Battle of Hydaspes (Vitstaa) – 326 BC (Alexander vs Porus). Alexander won this battle.
- Vitstaa is currently known as Jhelum River. Alexander died in 323 BC at the age of 33 in Babylon (Iraq)

Mauryan Empire (322 BC to 185 BC) – Founded by Chandragupta Maurya. He killed Dhanananda.

- Teacher of Chandragupta – Kautilya (Chanakya or Vishnu Gupt). Chanakya wrote Arthashastra Book.
- Seleucus Nicator (commander of Alexander) fought with Chandragupta Maurya in 305 BC and Lose the Battle.
- Magasthenese was the ambassador of Seleucus Nicator. Indica was written by – Magasthenese.
- C. Maurya died in 298 BC via Jainism Rituals known as Santhara. His resting place at Shravanabelagola (Karnataka)
- Son of Chandragupta was Bindusara.

Ashoka – Ashok was son of Bindusara. Ashok was one of the Greatest Mauryan king.

- Ashoka is also known as **Devanampiya Piyadasi** (means Beloved of the Gods)
- Battle of Kalinga – 261 BC. Kalinga is presently located at Odisha (Utkal Coast).
- After the Battle of Kalinga Ashoka adopted the Buddhism Religion and made many stupas, rock edicts etc.
- Ashoka installed the Rock Edicts (14) and Pillar Edicts (7) at different places in India and other countries.
- Ashoka started the new moral laws named Dhamma.
- Ashokan edicts script was **Brahmi**. Ashokan edicts script was first deciphered (read) by – James Prinsep (1837).
- Ashoka built Sanchi Stupa at Raisen District (Madhya Pradesh)
- Lion Capital of Ashoka (National Emblem of India) installed by Ashoka at Sarnath, Near Varanasi (UP) in 250 BC.
- Brihadratha was last Mauryan ruler, was killed by Pushyamitra Shunga and founded Shunga Dynasty in 185 BC.

Post Mauryan – Shunga Dynasty – founded by Pushyamitra Shunga (182 BC to 73 BC)

- Kanva Dynasty – Founded by Vasudeva (72 BC to 30 BC)
- Satavahana Dynasty – Founded by Simuka (30 BC to 250 AD). Satavahana belong from Andhra Pradesh.
- Indo–Greek – Minander was the great king of Indo Greek.
- Milindpanho – Conversation between Minander and Nagasena (Buddhist monk)
- Indo–Greek gives us Seven Days in the Week, 12 Zodiac (Rashiya), Horoscope and Calendar Year
- Kushana Dynasty – Founded by Kujula Kadphises.
- Vim Kadphises (Kushana Dynasty) was first person who introduced the Gold Coins in India.
- Kanishka (Kushana Dynasty) was the great king of Kushana Dynasty.
- Kanishka started 'Saka Era' in 78 AD. It is official Samvat of Govt of India.
- Kanishka patronized Charaka who wrote Charaka Samhita
- Vikramaditya started 'Vikram Samvat' in 57 BC.

Gupta Empire (319-500 AD) – Also known as the Golden Age of India

- Founded by – Sri Gupta. Real founder – Chandragupta I.
- Samudragupta is known as Napoleon of India. Harisena was his official poet. Harisena wrote Prayag Prashasti.

Chandragupta II Vikramaditya –

- Mehrauli Iron Pillar (in the courtyard of Qutub Minar, New Delhi) installed by Chandragupta II Vikramaditya.
- Vikramaditya has Nine Gems (9 Noble Person) popularly known as **Navratna's** –

- Amarsimha was a lexicographer.
- Kalidasa was a playwright. Popularly known as Shakespeare of India.
- Kahapanka was an astrologer
- Dhanvantri was an excellent physician (doctor)
- Sanku worked in architecture
- Varahamihira was also an astrologer. He wrote Panchasiddhantika, Brihat Samhita, and Brihat Jataka
- Vararuchi was a grammarian and wrote Prakrit language grammar. Vetalbhata was a magician
- Aryabhatta was a Mathematician – use of **0**, value of **pie** (π). Aryabhatta prove that earth is round & revolve around sun.
- Aryabhatta also told the real reason for Solar and Lunar eclipse. Surya Siddhanta book was written by Aryabhatta.
- Chinese traveler Fa-Hien (399 to 414 AD) visited India during Chandragupta II Vikramaditya time period.
- Fo-Kwo-Ki book was written by Fa-Hien.
- Kumargupta – Founded the Nalanda University at Bihar. Ajanta cave paintings (Maharashtra) are of Gupta period.
- Vishnu Sharma wrote Panchatantra.

Pushyabhuti Dynasty (Vardhana) of Thaneshwar – Founded by – Prabhakara Vardhana (Pushyabhuti)

Harshavardhan (606-647 AD) – Earlier Capital – Thaneshwar (modern Kurukshetra, Haryana). Later – Kannauj (UP).

- Last great Hindu king. Harshavardhan was defeated by Pulkesin II (king of Chalukya Dynasty).
- Banabhatta was poet of Harshvardhan, wrote **Harsha Charita** and **Kadambari**.
- Harshvardhan wrote **Nagananda**, **Ratnavali** and **Priyadarshika** books
- Chinese traveler Hiuen Tsang (629-645 AD) visited India during Harshvardhan time period.
- Si-Yu-Ki book was written by Hiuen Tsang. He told India as Yin Tu in his book.

Various aspects of Ancient India –

- The rock cut temple of Kailash at Ellora (Maharashtra) – By Krishna I (Rashtrakuta Dynasty)
- Zain-ul-Abidin (sultan of Kashmir) is known as Akbar of Kashmir.
- Dharam Pala (Pala Dynasty) established Vikramshila University at Bhagalpur, Bihar
- Bhima-I commander Vimal Shah and Vastapul Tejpal built the Dilwara Jain Temple at Mount Abu, Rajasthan.
- Dantidurga was the founder Rashtrakuta dynasty.
- Sangam Age – Assembly of Tamil scholars in South India. Silappadikaram, Manimekalai are famous book
- Narsimha deva-I (Ganga Dynasty) built Konark Sun Temple.
- Ananta Varman Chodaganga Deva (Ganga Dynasty) built the Puri Jagannath Lord Vishnu Temple at Odisha in 12th century.

The Chola Empire (800-1200 AD) – Founder – Vijayalaya

- Rajaraja-I built Brihadeshwara Temple at Tanjore (TN) in 1010 AD. It is world 1st Granite temple dedicated to Lord Shiva.
- Rajaraja-I conquered Ceylon (Sri Lanka) and Ceylon was completely won by Rajendra Chola-I.
- Nataraja (Shiva) Tandava bronze sculpture made by Chola's.
- Local Self - governance (Panchayat) was introduced by the Cholas. Chola's was the first kingdom to have a strong Navy.
- Kambar (Kambar) wrote the Tamil Ramayana in 12th century.

MEDIEVAL INDIA

Rajput Era (Between 7th to 12th Century) –

- After Harshvardhan; Pala, Gurjar-Pratihara and Rashtrakutas Dynasties fought for the sovereignty over Kannauj (UP). At last, Gurjar-Pratihara won. Gurjar-Pratihara Dynasty founded by – Harishchandra and Nagbhata I
- Mihir Bhoj was a great Gurjar-Pratihara king. After Gurjar-Pratihara, Kannauj under the Gahadavala Dynasty.
- Rana Kumbha of Mewar built Vijay Stambh at Chittor. He also built Kumbhalgarh fort.

Chandelas of Jejakhukti – Located at Central India, near Madhya Pradesh. Capital – Khajuraho

- Khajuraho Sun Temple built by Dhangadeva Chandela

Islamic Invasion in India –

- First Muslim Invader – Muhammad Bin Qasim (712 AD) at Sindh. At that time Dahir was king of Sindh
- Mahmud Ghaznavi raided India as many as 17 times (1001-1027 AD) and looted Somnath Temple (Gujarat) in 1025 AD.
- When Mahmud Ghaznavi invade over Somnath Temple, the king of Gujarat was – Bhima-I of Chalukya Dynasty,
- Al Beruni visited India with Mahmud Ghaznavi, wrote 'Kitab-ul Hind (Tahqiq-I-Hind)'
- Jaichand (Gahadavala Dynasty) invited Mohammad Ghori due to rivalry with Prithviraj Chauhan III.
- **Chauhan of Shakambhari (Ajmer)** – Prithviraj Chauhan belong from this dynasty. He is also known as **Rai Pithora**.
- First battle of Tarain – 1191 AD (against Mohammad Ghori) – Ghori lost
- Second battle of Tarain – 1192 AD (against Mohammad Ghori) – Prithviraj Chauhan lost and died.

- Chanderbardai was court poet of Prithviraj Chauhan, wrote **Prithviraj Raso**
- Jaichand (Gahadavala Dynasty) fought battle of Chandwar against Muhammad Ghori in 1194 and lost.
- Later Muhammad Ghori died in 1206 and after his death his slave Qutubuddin Aibak founded the Slave Dynasty.

Delhi Sultanate –

Slave Dynasty (1206-1290 AD) –

- Also known as Mamluk Dynasty or Ghulam Dynasty. Founded by – Qutubuddin Aibak (Slave of Muhammad Ghori).
- Aibak built Adhai Din Ka Jhopra (Ajmer), Quwwat-ul-Islam (Delhi) and started the construction of Qutub Minar (Delhi).
- Aibak was given the title of Lakh Baksh and Peel Baksh and Quran Khan.
- Aibak died while playing Chaugan (Polo) in 1210. Tomb of Aibak located at Lahore.
- Bakhtiyar Khilji (military general of Qutub-ud-Din Aibak) destroyed Nalanda University
- The construction of Qutub Minar completed by Iltutmish (slave of Aibak).
- Iltutmish is known as Slave's Slave. He issued Jital of copper and Tanka of Silver coins.
- Mongol ruler Chaghe Khan invaded India during the reign of Iltutmish
- Turkan-e-Chahalgani (40 slaves or Corps of 40) was set up by Iltutmish.
- Razia Sultan was the first and only Muslim woman to rule India in Delhi Sultanate.
- Balban was last great slave king. He started the Sijda and Paibos.
- Balban started to celebrate Irani festival Navroz in India. He also introduced the Blood and Iron Policy in India.

Khilji Dynasty (1290-1320 AD) – Least ruling dynasty.

- Founded by – Jalal-ud-din Firoz Khilji. He was succeeded by Alauddin Khilji.
- Alauddin Khilji started the system of Dagh and Chehra (Huliya). Title of Alauddin Khilji was Sikander-e-Sani
- Malik Kafur (1000 Dinari) was commander of Alauddin Khilji. He was 1st Muslim to reach at South India.
- Alauddin built Alai Darwaza at Qutub Minar campus. He also built the Siri Fort and Hauz Khas at Delhi.
- He fixed the price of all market commodities. Modern Army canteen is based on Alauddin Khilji model.
- Amir Khusro (Tota-e-Hind or Parrot of India) a famous poet was his courtier. Amir Khusro invents the Sitar.
- Padmavat written by Malik Muhammad Jayasi in 1540 (battle between Alauddin Khilji and Raja Ratan Singh of Chittor)

Tughlaq Dynasty (1320-1414 AD)- Longest ruling dynasty –

- Founded by – Ghiyas-ud-din Tughluq (Ghazi Malik). He built the Tughlaqabad Fort at Delhi.
- Mohammad Bin Tughlaq (Jauna Khan) is also known as Wise Fool king.
- He transfers his capital from Delhi to Devagiri (Maharashtra) and named it Daultabad.
- Qarachil expedition, Khurasan expedition, Taxation in Doab and Token currency also related with M B Tughlaq.
- Ibn Batuta (Morocco traveller) visited M B Tughlaq court. (Book- Rihla or Safarnamah)
- Firoz Shah was successor of M B Tughlaq. He constructed many canals.
- Firoz Shah established many cities like Hisar, Fatehabad, Firozabad, Jaunpur and Firoz Shah Kotla at Delhi.
- Firoz imposed Jaziya tax on non-Muslim. He also brought Meerut and Topra inscriptions of Ashoka to Delhi.
- Futuhat-e-Firozshahi was autobiography of Firoz Shah Tughlaq.
- Timur-e-Lung invaded India during Nasiruddin Mahmud Shah Tughlaq reign in 1398.

Sayyid dynasty (1414-1451 AD) – Founded by – Khizr Khan (commander of Timur-e-Lung).

Lodhi dynasty (1451-1526 AD) – Founded by – Bahlol Lodhi.

- Sikandar Lodhi founded the Agra City in 1504.
- He introduced Gaz- e- Sikandari for land measurement.
- Sikander Pen name was Gulrukhi.
- Ibrahim Lodhi was the last Sultan of Delhi Sultanate.
- Ibrahim Lodhi's uncle Daulat Khan Lodhi invited Babur at India.
- Ibrahim Lodhi lost to Babur in First battle of Panipat and died in 1526.

Mughal Empire – Babur (1526-30) –

- Founder of Mughal Empire – Babur. He came from Central Asia country Uzbekistan.
- First Battle of Panipat (1526) – Babur vs Ibrahim Lodhi (Ibrahim Lodhi lost and died). Babur won by Tulugma method.
- Autobiography of Babur– Tuzuk-I-Baburi (Baburanamah) in Turkish Language.
- Babur was the first to bring gun powder and cannons in India.
- Babur fought four battles in India and in every battle he won.

- Battle of Khanwa (1527) – Babur vs Rana Sangha.
- Battle of Chanderi (1528) – Babur vs Rajput ruler Medini Rai
- Battle of Ghagra (1529) – Babur vs Mehmood Lodhi.

Humayun (1530-40 and 1555-56) –

- Battle of Chausa (1539) – Humayun vs Sher Shah Suri (Sher Shah won)
- Battle of Kannauj or Bilgram (1540) – Humayun vs Sher Shah Suri (Sher Shah won)
- Got Delhi again in 1555 from Sikander Shah Suri. Humayun fell from the stairs of library in Delhi and died in 1556.
- Humayun's Tomb is in Delhi built by his wife Hamida Bano Begum. Din Panah was built by Humayun.
- Humayun Nama was written by Gulbadan Begum.

Sur Dynasty (1540-57) – Founded by Sher Shah Suri (1540-45) –

- Afghan Ruler. Belong to Sur Dynasty. Original name – Farid Khan. Title – Sher Khan (due to bravery)
- He started Silver Rupee and Copper Daam currency. Constructed the Grand Trunk Road (Peshawar to Kolkata).
- He constructed Purana Qila (Delhi) and Rohtashgarh Fort (Bihar). Sher Shah's Tomb is located in Sasaram (Bihar)
- Muhammad Adil Shah was successor of Sher Shah. Hemchandra Vikramaditya (Hemu) was his commander.
- Hemchandra Vikramaditya (Hemu) captured Delhi after Muhammad Adil Shah.

Akbar (1556-1605) – Born in 1542 at Amarkot during the exile period of Humayun.

- Second Battle of Panipat (1556) – Akbar vs Hemu, Akbar commander – Bairam Khan (Akbar Won)
- Abolished Slavery (1562), Pilgrim Tax (1563) and Jaziya Tax (1564). Akbar also built Agra Fort in 1565
- Akbar built Buland Darwaja at Fatehpur Sikri after Gujarat Victory (1572).
- Established Ibadat Khana at Fatehpur Sikri (UP) in 1575.
- Battle of Haldighati (1576) with Maharana Pratap. Akbar won this battle.
- Declaration of Mazhar in 1579 and started Din-I-Ilahi in 1582.
- Akbar established matrimonial alliance with the Rajput's. His wife was Jodhabai.
- Akbar started the Mansabdari system which was based on Jat and Swaar.
- Navratna of Akbar (9 Gems)–
- Birbal (Mahesh Das) was his prime minister. Abul Fazl wrote Akbarnama or Ain-I-Akbari.
- Todarmal was his finance minister, introduced Zabti and Dahsahla System. Tansen was the famous musician.
- Maan Singh was Akbar army commander.
- Abdul Rahim Khan-I-Khana (son of Bairam Khan) translated Baburanamah into Persian (Farsi) language.
- Court language of Akbar was Arabic. Tulsidas was Akbar's Contemporary, wrote Ramcharit Manas in Awadhi language.
- Razmanama – Persian translation of Mahabharata during Akbar reign.
- Akbar's tomb is in Sikandra (near Agra) in Uttar Pradesh.

Jahangir (1605-27) – Original name – Salim (birth in 1569). The Bell of Justice was installed by Jahangir in Agra

- He executed 5th Sikh Guru Arjun Dev due to help of Prince Khusrav Mirza (son of Jahangir).
- English traveller Captain Hawkins (1608) and Thomas Roe (1615) visited Jahangir court.
- Autobiography Tuzuk –I- Jahangiri in Persian. Wife of Jahangir was – Nur Jahan (original name – Mehr-un-Nissa)
- Golden age of Mughal Paintings during Jahangir period.

Shahjahan (1627-58) – Original name – Khurram. Golden age of Mughal Architecture during Shahjahan period.

- Built Peacock Throne (Mayur Singhasan or Takht-I-Taus). Kohinoor diamond was part of this throne.
- Shahjahan built Taj Mahal (Agra), Red Fort and Jama Masjid in Delhi. He also built Diwan-I-Khas and Diwan-I-Aam in Agra.
- Taj Mahal built in the memory of Shahjahan wife Mumtaz Mahal (Arjumand Banu Begum)
- He built the capital city of Shahjahanabad (Old Delhi) instead of Agra.
- French traveller Bernier and Tavernier, Nicolao Manucci (Italy) visited his court.

Aurangzeb (1658-1707) – Called Zinda Pir which means his simple living and high thinking

- Killed his brother Dara Shikoh and imprisoned his father, Shahjahan. Later Shahjahan died at prison.
- He built Bibi ka Maqbara (tomb) in memory of his wife Dilras Banu begum (Rabia-ud-Durrani) at Aurangabad (MH).
- This tomb is also known as Second Taj Mahal or the copy of Taj Mahal.
- Last Great Mughal Emperor. Started Jaziya tax again in 1679 on Hindu.
- Shivaji was contemporary of Aurangzeb. Aurangzeb executed 9th Sikh Guru Teg Bahadur

Other facts about Great and Later Mughals –

- Salim Chishti tomb, Panch Mahal (by Akbar), Diwan-I- Khas and Diwan- I- Aam are in Fatehpur Sikri.
- Peacock throne, looted by Nadir Shah in 1739 in Battle of Karnal against Muhammad Shah Rangeela.
- Pietra Dura technique is related with architecture, was famous in Mughal Period.
- Farrukhsiyar issued Shahi Farman to the British. This is known as Magna carta for East India Company.
- Farrukhsiyar also killed Banda Singh Bahadur. Banda Singh Bahadur was Sikh warrior of Guru Gobind Singh.
- Battle of Buxar held during Shah Alam II time period. Akbar II give RAJA title to Mohan Roy.
- Bahadur Shah Zafar II was last Mughal emperor. Revolt of 1857 held during his time period.

Maratha Empire – Founded around Maharashtra and nearby regions.

Chhatrapati Shivaji (1627-1680) –

- Born at Shivneri Fort. Father Name – Shahaji Bhonsle. Mother Name – Jijabai. Guardian – Dadoji Konddev
- Religious teacher – Samarth Guru Ramdas. Father of Indian Navy – Shivaji
- Shivaji was experts in Guerilla Warfare.
- Central Administration done by Asthpradhan Council. Peshwa was Prime Minister of Shivaji.
- Sardeshmukhi and Chauth were the main taxes during Maratha.
- Sambhaji, Rajaram, Sahu, Balaji Vishwanath and Bajirao I, Balaji Bajirao successor of Shivaji.
- Third Battle of Panipat – Ahmad Shah Abdali vs Maratha (Sadashiv Rao Bhau and Vishwas Rao). Maratha lose this battle.
- Later Maratha powers divided into Holkar of Indore, Gaekwad of Baroda, Scindias of Gwalior and Bhonsle of Poona.

Vijayanagar Empire – Founded by – Harihar and Bukka-I (1336 AD) in Karnataka on the bank of Tungabhadra River

- Vijayanagar and Bahmani empire formed during Muhammad Bin Tughlaq region.
- Currently Vijay Nagar is known as Hampi. Sangam, Saluva, Tulava and Aravidu dynasty ruled over Vijay Nagar empire.
- Krishna Deva Raya (Tulava Dynasty) was the greatest Vijay Nagar king. Tenali Rama in his court.
- Krishna Deva Raya patronized Telugu Language. Golden age of Telugu literature during Krishna Deva Raya time period.
- Battle of Talikota – Vijay Nagar vs Aligned forces of Ahmednagar, Bijapur, Golkonda and Bidar.
- Battle of Talikota or Rakshasi Tangadi (Bannihatti) – 1565. After that Vijay Nagar empire was ended.
- Vijay Nagar had famous rivalry against the Bahmani kingdom.

Bahmani Kingdom – Founded by – Bahman Shah or Hasan Gangu. Gulbarga was the capital of Bahmani Kingdom.

- Mohammad Adil Shah built Gol Gumbaz at Bijapur (largest stone work dome in the world).
- Charminar of Hyderabad was built by Qutub Quli Shah.
- Later Bahmani Kingdom divided into 5 parts – Ahmednagar, Bijapur, Golkonda, Bidar and Berar.

Bhakti and Sufi Movement – Sufism means Soof, Safa and Wool. Famously known as Silsila.

- Sheikh Moinuddin Chishti Shrine (Dargah) is located at Ajmer.
- Sheikh Nizamuddin Auliya, Baba Farid, Sheikh Salim Chishti (Akbar region) was famous Sufi Saint.

Bhakti Saints –

- Ramananda spread Bhakti movement in North India. He has 7 different caste Disciples – Kabir (Weaver), Raidasa or Ravidas (Cobbler), Sena (Barber), Sadhana (Butcher), Dhanna (Jaat), Narahari (Goldsmith) and Pipa (Rajput).
- Adi Shankaracharya founded four Peeth (Monasteries) – Shringeri (in South, Karnataka), Puri or Govardhan (in East, Odisha), Dvaraka or Sharda (in West, Gujarat), and Badarinatha or Jyotirmath (in North, Uttarakhand)
- Alvar (Vishnu) and Nayanar (Shiva) were south Indian religious sects.
- Chaitanya Mahaprabhu – Famous Bengali Krishna devotee. Mirabai, Surdas – Krishna devotee.
- Tukaram was contemporary of Shivaji

MODERN INDIA

The Portuguese –

- Bartholomew Diaz (Portuguese) discovered Cape of Good Hope (South Africa) in 1488.
- Vasco da Gama reached India in 1498 via Cape of Good Hope. He was 1st European who came to India via Sea-Route.
- He was welcomed by King Zamorin of Calicut (Keralam).
- Blue water policy was started by Francisco de Almeida (1st Portuguese Governor)
- First Factory – Cochin. Albuquerque captured Goa in 1510 from Bijapur king Adil Shah
- Portuguese introduced Tobacco, Tomato, Potato, Printing Press and Shipbuilding method in India.
- in 1661 Portuguese princess Catherine married with British prince Charles II and British got Bombay as dowry.
- They were the last European to leave India in 1961 (Goa, Daman and Diu)

The Dutch – Come to India from Netherlands (Holland) in 1602.

- First factory at Masulipatnam (Andhra Pradesh) in 1605
- Dutch power was ended by Battle of Badera in 1759 against British East India Company.

The English –

- The British East India company was set up on 31 December 1600 by Queen Elizabeth – I. Came to India in 1608.
- Captain William Hawkins was a merchant who came to India in 1600.
- First factory was set up at Surat in 1613.
- Thomas Roe got the Royal Farman (permission) from Jahangir. Francis Dey founded Madras.
- Gerald Aungier founded Bombay. Sir Job Charnock founded Kolkata. Fort William established at Kolkata.
- East India company ended in 1858 and Queen of England took over the control of India after 1858 to till 1947.
- The British left India on 15 August 1947.

Note: Danes come from Denmark (1616) in India and left in 1745.

The French –

- The French came to India in 1664. French was last European company who came to India.
- First factory at Surat (Gujarat). Dupleix was the most famous French governor.
- Carnatic wars, Battle of Wandiwash (1760) were fought against the English. French lost it and they lose hold in India.
- The French left India in 1954 when Puducherry and Chander Nagar got independence.

Battle of Plassey – Plassey is presently located in West Bengal.

- Murshid Quli Khan founded Bengal state. His successor was Alivardi Khan. Siraj-ud-Daulah was successor of Alivardi Khan
- Black Hole tragedy happened just before Battle of Plassey (20 June 1756).
- Battle of Plassey fought between English East India Company (Robert Clive) and the Nawab of Bengal (Siraj-ud-Daulah)
- Fought on 23 June 1757. Siraj-ud-Daulah lost the battle and died.
- Siraj-ud-Daulah army general Mir Jaffer betrayed him. Only Mohan Lal and Mir Madaan fought with bravery and both died
- Mir Jaffer become Nawab of Bengal after this battle.
- Later British East India Company made Mir Qasim (1760-64) the Nawab of Bengal by replacing Mir Jafar

Battle of Buxar – Buxar is presently located in Bihar.

- Fought between the English East India Company (Hector Munro) and the combined forces of Nawab of Bengal (Mir Qasim), Nawab of Awadh (Shuja-ud-Daulah) and Mughal Emperor (Shah Alam-II).
- Fought on 22 October 1764. Combined forces lost the battle.
- Treaty of Allahabad (August 1765)- land revenue rights (Diwani) of Bengal, Bihar and Orissa were given to the company.

Anglo-Mysore war – Wadiyar's founded the Mysore Dynasty after Vijay Nagar Empire.

- Real founder of Mysore was Haider Ali. Mysore old name was Mahishura Nagara.
- 1st Anglo-Mysore war – 1767-69 by Haider Ali. End with Treaty of Madras.
- 2nd Anglo-Mysore war – 1780-84 by Haider Ali (till 1782) and Tipu Sultan. End with Treaty of Mangalore.
- 3rd Anglo-Mysore war – 1790-92 by Tipu Sultan. End with Treaty of Seringapatam
- 4th Anglo-Mysore war – 1799 by Tipu Sultan and he was died.
- Lion of Mysore – Tipu Sultan

Anglo-Maratha war –

- 1st Anglo-Maratha war – 1775-82. East India Company (EIC) won and battle end with Treaty of Salbai
- 2nd Anglo-Maratha war – 1803-05. EIC won and battle end with Treaty of Surji-Anjangaon
- 3rd Anglo-Maratha war – 1816-19. EIC won and Maratha dynasty ended.

Anglo-Sikh war – Ranjit Singh (1780-1839) established the Sikh Empire in Punjab. He belongs to Sukerchakia Misl.

- Ranjit Singh popularly known as Sher-e-Punjab or "Lion of Punjab"
- 1st Anglo-Sikh war – 1845-46. EIC won and battle end with Treaty of Lahore.
- 2nd Anglo-Sikh war – 1848-49. EIC won and Punjab merged in British Empire.

India (1772 to 1800) – First governor General of Bengal – Warren Hastings after Regulating Act 1773

- Asiatic Society of Bengal founded in 1784 by William Jones.
- Lord Cornwallis is known as father of Indian Civil Services and father of Police system in India.
- Subsidiary Alliance introduced by Lord Wellesley (1798). Hyderabad was first state under Subsidiary Alliance in 1798.
- Fort William college in Calcutta in 1800 by Lord Wellesley.

- Burhan-ul-Mulk Saadat Khan was the founder of the Awadh state.
- Nizam-ul-Mulk Asaf Jah was the founder of the Hyderabad state.

Land Revenue Systems by East India Company in India –

1. Permanent Settlement or Zamindari Settlement- 1793 by Lord Cornwallis in Bengal, Bihar, Orissa. Sun Set Law 1794.
2. Ryotwari or Peasant system – 1820 by Thomas Munro and Captain Reed in Bombay, Madras and Kolkata.
3. Mahalwari system (Mahal means Village) – 1822 by Holt Mackenzie Introduced in Central India, Ganga valley and Punjab.

INDIA – (1800 to 1857) –

- First Governor General of British India – Lord William Bentinck (1833)
- Father of modern western Education in India – Lord William Bentinck
- Policy of Paramountcy – Lord Hastings. Doctrine of Lapse started by Lord Dalhousie.
- Universities were opened at Calcutta, Bombay and Madras (1857)

The Revolt of 1857 – Also Known as First war of Independence

- There were many reasons of revolt of 1857 but main reason was introduced the **Enfield Rifle** instead of Brown Bess Rifle.
- In Enfield Rifles greased cartridges was used. These cartridges made with skin of pork (pig) and beef (cow).
- Mangal Pandey (34th Native Infantry) of Barrackpore Cantonment was the 1st Martyr (Shaheed). Died on 8 April 1857.
- The revolt started from Meerut on 10 May 1857.
- Bahadur Shah Zafar-II the last Mughal Emperor was chosen as the leader of revolt of 1857.
- It ended in 1858 and the power went in hands of British Crown from East India Company.
- The post of governor general also abolished and new post Viceroy was introduced.
- Last Governor General and first Viceroy – Lord Canning (1858)
- Indian Penal Code – 1860 by Lord Macaulay formed after 1857 revolt.
- Bahadur Shah Zafar-II arrested and sent to Rangoon Prison (Burma, Myanmar), where he was died in 1862.

1857 Revolt leaders –

- Delhi – Bahadur Shah Zafar-II and General Bakht Khan (commander of B S Zafar)
- Lucknow – Begum Hazrat Mahal, Birjis Qadir
- Jhansi – Rani Laxmibai (suppressed by General Hugh Rose)
- Gwalior – Tatya Tope
- Kanpur – Nana Saheb (Dhondu Pant)
- Bihar – Kunwar Singh
- Rewari (Haryana) – Rao Tula Ram

Major Indian Revolts by Farmers and Others –

- Sanyasi Revolt (Bengal) – by Manju Shah and Devi Chaudhrani. This revolt mentioned in Anand Math of B C Chatterjee.
- Fakir Revolt (Bengal). Kuka Movement (Punjab) – by Bhagat Jawahar Mal and Ram Singh
- Santhal Revolt (Bihar and Nearby regions) – by Sidho and Kanho
- Munda Revolt (Jharkhand) – by Birsa Munda in 1899-1900. Against Diku's (Outsiders)
- Indigo Revolt (Neel Vidroh) at Bengal – by Digambar and Vishnu Vishwas. mentioned in Neel Darpan (Dinabandhu Mitra)
- Moplah Revolt – Malabar Coast at Kerala
- Bardoli Revolt (Gujarat, 1928) – Led by Vallabh Bhai Patel. It was against tax increase by 30% by British Govt. After revolt it was reduced to 6.3%. Farmers of Gujarat gave Sardar title to Vallabh Bhai Patel.

Socio-Religious Movement in British India –

Raja Ram Mohan Roy Father of Indian renaissance or Father of Modern India

- Founded **Atmiya Sabha** in **1815**. Started Sambad (Samvad) Kaumudi magazine in Bangla Language (1821).
- Mirat-ul-Akhbar in Persian Language in 1822. Founded **Brahmo Samaj in 1828** – to reforms in Hindu Religion
- **Abolition of Sati** in **1829** with Lord William Bentinck. Akbar-II give **RAJA** title to Ram Mohan Roy.
- Died in 1833 at Bristol, England. Here is resting place of Raja Ram Mohan Roy.
- After Raja Ram Mohan Roy Devendra Nath Tagore founded Tattvabodhini Sabha in 1839.
- **Prarthana Samaj (1867)** – Atmaram Panduranga. Later Mahadeo Gobind Ranade also join this.
- **Satyashodhak Samaj (1873)** – Mahatma Jyotiba Phule. Book – Gulam Giri
- **Theosophical Society (1875)** – Madame H. P. Blavatsky and Colonel Olcott at New York (USA)
- **Young Bengal movement** – Henry Vivian Derozio. He is also known as **First Nationalist Poet**.
- **Self-respect movement** – E.V. Ramaswamy Naicker "Periyar" in 1925 at Tamil Nadu
- **Arya Samaj (1875)** by Swami Dayanand Saraswati in Bombay. Book – Satyarth Prakash
- Original Name of Swami Dayanand Saraswati was Mula (Mool) Shankar (1824-1883). Born at Tankara (Gujarat)

- Arya Samaj motto – **Get back to the Vedas.**
- Dayanand Anglo Vedic (DAV) schools were started by Arya Samaj. 1st School established at Lahore (1886) by Lala Hansraj.
- It also started Suddhi Movement and Pakhand Khandini Pataka.
- **Ramakrishan Mission** (1897) by Swami Vivekananda at Kolkata
- Swami Vivekananda was student of Swami Ram Krishan Paramhansa
- Original Name of Swami Vivekananda was Narendra Nath Datta (12 January 1863-1902). Born at Kolkata.
- Every year National Youth Day (Rastriya Yuva Diwas) on 12 January is celebrated on Vivekananda birthday.
- Parliament of religions Conference – 1893 at Chicago (USA) by Swami Vivekananda.
- Sister Nivedita or Margret Noble was student of Swami Vivekananda
- **Aligarh Movement (1875)** – Sir Syed Ahmad Khan.
- Mohammedan Anglo oriental college founded by Sir Syed Ahmad Khan in 1875.
- Later it became Aligarh Muslim University in 1920.
- **Wahabi Movement (1820)** – By Sayyid Ahmad of Rae Bareli. Main objective to reform in Muslims and Muslims education.

Reforms by the English –

- Abolition of Slavery – 1843 (by Lord Ellenborough)
- Widow Remarriage Act – 1856 (Lord Canning with Pt. Ishwar Chandra Vidyasagar)
- Sharda Act – 1929 (Minimum age for marriage -14 years for girls and 18 years for boys) by Dr. Harbilas Sarda

Education in Modern India –

- Father of English education in India – Lord Macaulay. Asiatic Society of Bengal was founded by William Jones in 1784.
- Charles Wilkins translated Bhagwat Gita and William Jones translated Abhijanagyan Shakuntala into English
- Fort William College founded at Kolkata by Lord Wellesley in 1800.
- First time 1 Lakh rupees reserved for education in India by charter act 1813.
- Hindu College founded at Kolkata by David Hare and Raja Ram Mohan Roy in 1817.
- English language made compulsory-1835 by Macaulay.
- India's first girls' school in 1848 at Bhidewada, Pune by Mahatma Jyotiba Phule and his wife Savitribai Phule,
- Magna Carta of English Education in India – The Wood's Despatch (1854) by Sir Charles Woods and Lord Dalhousie.
- Kolkata Bombay and Madras university established in 1857.
- Vernacular Press Act – Lord Lytton in 1878. Liberator of Indian Press – Sir Charles Metcalfe
- India's first Female University open in 1906 at Bombay by Dr. Dhondo Keshav (DK) Karve
- Banaras Hindu University by Madan Mohan Malviya in 1916
- Hunter and Sadler commission related with education reforms in India.
- First Newspaper of India – Bengal Gazette (James Augustus Hicky) in 1780 in English Language.
- First Hindi Newspaper – Udant Martand (Pt. Jugal Kishore Shukla) in 1826.
- Oldest Running Newspaper – The Bombay Samachar (Fardourji Marsban) from 1822 to Till Now.

Indian National Congress (INC) – Congress means – A Group of People

- Established in Bombay at Gokuldas Tejpal Sanskrit College (Gwalia Tank) on 28 December 1885.
- Founded by – Allan Octavian (AO) Hume. He was also 1st secretary of INC.
- Viceroy when INC formed – Lord Dufferin
- First president of INC – Womesh Chandra (WC) Banerjee. Only 72 members available in 1st session.
- First Parsi president – Dada Bhai Naoroji. First Muslim president – Badruddin Tyabji.
- Dada Bhai Naoroji was also first Indian to become a member of British Parliament.
- First European president – George Yule. He was also 1st elected president.
- First woman president – Annie Besant (Kolkata, 1917). Annie Besant from Ireland.
- First Indian woman president – Sarojini Naidu (Kanpur, 1925). Congress president on 15 august 1947 – JB Kriplani.
- Only time when Gandhi was the President – 1924 (Belgaum)

Indian National Movement (1885-1907) –

- Partition of Bengal – 16 October 1905 by Lord Curzon.
- Swadeshi and Boycott (Bahishkar) Movement started after Partition of Bengal in 1906.
- Vande Mataram became popular during Swadeshi movement and Partition of Bengal.
- **Muslim League** – founded at Dacca or Dhaka (now in Bangladesh) – 30 December 1906 by Agha Khan and Salimullah.

- Muslim League was first Muslim Political Party in India.
- The English Government introduced the policy of divide and rule to suppress nationalism, so that it would be easier to control over Indians.

• **Surat Split (1907)** – Congress divides in two parts- Moderate (Naram Dal) and Extremist (Garam Dal)

- Moderates phase (1885-1907). Leaders - GK Gokhale, Madam Mohan Malviya, Dada Bhai Naoroji, Firozshah Mehta
- Extremist phase (1907-1919). Leaders- Lala Lajpat Rai, Bal Gangadhar Tilak and Bipin Chandra Pal (LAL-BAL-PAL)

Indian National Movement –

- Morley – Minto Reforms (1909) – Separate electorate for Muslims.
- First Delhi Darbar – 1877 by Lord Lytton – Queen Victoria become empress of India in 1877.
- Second Delhi Darbar – 1911 by Lord Hardinge. King George V and Madam Merry came to India.
- Capital shifted declaration from Kolkata to Delhi and Abolish the Partition of Bengal in 1911 by King George V.
- Ghadar Party – 1913 by Lala Har Dayal at San Francisco (USA). Sohan Singh Bhakna was 1st secretary of Ghadar Party.
- Komagatamaru ship incident (Japanese Ship) – 1914 by Baba Gurdit Singh. He reached at Vancouver, Canada
- Home Rule league – 1916 by BG Tilak and Annie Besant started it.
- Tilak started the Maratha (in English) and Kesari (in Marathi) newspaper. Tilak working area was Poona and Maharashtra
- Annie Besant started the New India and Commonweal newspaper. Working Area was Adyar and Madras.
- Lucknow Pact of 1916 headed by Ambika Charan Majumdar – Congress and Muslim League patched up.
- **Rowlatt Act (March 1919)** – Introduced by Sir Sydney Rowlatt. Also known as Black Law or Kaala Kanoon.
- This act gave the police way more power than appropriate. They could arrest anyone without a warrant and detain anyone without a trial. This act also called as "No Appeal, No Vakeel, No Daleel.
- **Jallianwala Bagh Massacre (Amritsar)** – 13 April 1919 (Baisakhi) by General Reginald Dyer.
- After Jallianwala Bagh Massacre Rabinder Nath Tagore surrendered his Knighthood Title.
- Gandhiji return his Kaiser-e-Hind title after Jallianwala Bagh Incident.
- **Khilafat Movement** – 1919 by Shaukat Ali and Mohammad Ali (Ali Brothers).

Gandhian Phase (1915 to 1947)

• Gandhiji at a Glance –

- Birth Date: 2 October 1869, Death Date: 30 January 1948 (killed by Nathu Ram Godse)
- Birth Place: Porbandar, Kathiyawad (Gujarat).
- Father Name: Karam Chand Gandhi
- Wife Name: Kasturba Gandhi
- Went South Africa in 1893. Came from South Africa on 9 January 1915 (NRI Day)
- Natal Congress, Phoenix Farm and Tolstoy Farm established by Gandhiji at South Africa.
- Autobiography: My Experiment with Truth (Satya Ke Saath Mere Prayog) in 1925.
- Famous Title's: Rashtrapita or Father of the Nation (by Subhash Chandra Bose), Bapu (by J L Nehru), Mahatma (by Rabinder Nath Tagore), Naked or Nanga Fakir (by Winston Churchill)
- Famous Papers: Indian Opinion, Young India, Harijan
- Champaran Satyagraha at Bihar (1917) by Gandhi ji for indigo farmers (Tin Kathiya System)
- Ahmedabad Mill Strike (1918) – First Hunger Strike of Gandhiji for plague bonus of mill workers.
- Kheda Satyagraha (1918) by Gandhiji for farmers.
- First mass movement – **Non-Cooperation Movement** – Started on 1 August 1920
- After Chauri Chaura Incident (Gorakhpur, UP) on 4 Feb. 1922, Gandhiji recalled it on 12 February 1922.
- Swaraj Party formed by Chittaranjan (CR) Das and Motilal Nehru in 1923 after Non-Cooperation Movement
- Simon Commission appointed in 1927. Reached India in 1928. Total 7 members in this commission, all were British. It was also known as White Commission. Lajpat Rai died while protesting killed by Saunders.
- Nehru Report – 1928 by Moti Lal Nehru (father of Jawahar Lal (J.L) Nehru)
- Lahore session (1929), Poorna Swaraj resolution passed by J L Nehru. Poorna Swaraj means Complete Independence
- First Poorna Swaraj Day celebrated on 26 January 1930
- **Civil Disobedient Movement** – Started in March - April 1930 after Dandi March.
- Dandi March or Salt Satyagraha started by Gandhiji from Sabarmati to Dandi (12 March 1930 to 6 April 1930)- 240 miles.
- Total Satyagrahi of Dandi March – 78. It was against the Salt Law made by Britishers.

- Woman participant – Sarojini Naidu, Kamla Devi Chattopadhyay
- Salt Satyagraha in South India – C Rajagopalachari at Tamil Nadu.
- First Round table conference – 1930 at London. Congress did not participate in it.
- Gandhi - Irwin Pact – 5 March 1931 for participation congress in 2nd round table conference.
- Second Round table conference – 1931 at London attended by Congress (Gandhiji)
- Third Round table Conference – 1932 at London. Congress not participated in it.
- BR Ambedkar attained all 3 Round Table Conference and Congress participated only in 2nd Round table Conference.
- Communal Award by Ramsay McDonald (British PM). Gave Separate electorate to Dalits after Muslim, Sikh and Christians.
- Poona Pact – 1932 between Gandhi and BR Ambedkar (seat increase from 71 to 147)
- Government of India Act – 1935.
- Individual satyagraha – 17 October 1940 by Vinoba Bhave (1st Satyagrahi), JL Nehru (2nd Satyagrahi).
- Individual satyagraha means India is not with British in the 2nd World War.
- Cripps Mission – March 1942. British want to give Dominion State to India. Gandhiji told it Post Dated Cheque.
- **Quit India movement** – Started on 8 August from Bombay (Maharashtra).
- Gandhiji gave the slogan of **Do or Die (Karo ya Maro)**.
- British Govt. start the Operation Zero Hour and arrest Gandhiji, JL Nehru, Dr. Rajendra Prasad, Sarojini Nayadu etc.
- Other leader – Aruna Asaf Ali, Ram Manohar Lohiya, Sucheta Kriplani, Jai Prakash Narayan etc.
- Woman who unfurled Indian flag during Quit India Movement – Aruna Asaf Ali at Bombay on 9 August 1942.
- Radio announcer during Quit India Movement – Usha Mehta
- Cabinet mission plan – 1946 (members- A.V Alexander, Stafford Cripps and Pethick-Lawrence)
- **Pakistan Demand** – PAKISTAN name was coined by Ch. Rehmat Ali (a scholar of Cambridge University).
- PAKISTAN means- P (Punjab), A (Afghanistan), KI (Kashmir), S (Sindh) and TAN (Baluchistan)
- Separate country 'Pakistan' was demanded by Muslim league in 1940 at Lahore Session.
- Direct action day by Mohammad Ali Jinnah – 16 August 1946.
- Partition by Mountbatten Plan on 3 June 1947.
- First Governor General of Pakistan – Mohammad Ali Jinnah. First Prime Minister of Pakistan – Liaquat Ali Khan
- **India Got Freedom –**
- Clement Attlee's announcement (20 Feb. 1947) – He announced the British left India till June 1948
- Prime minister of Britain when India got independence – Clement Attlee.
- Mountbatten Plan or 3rd June Plan – India divided into 2 independent nations i.e., India and Pakistan
- Pakistan Independent on 14 August 1947 and India got freedom on 15 August 1947.
- Jawahar Lal Nehru's speech on 15th August 1947 – **Tryst with Destiny**.
- Gandhiji was at Noakhali (West Bengal) when India got Independence
- Integration of Princely states by – Sardar Patel.
- **Revolutionary Phase –**
- Khudiram Bose was hanged on 11 August 1908 at the age of 18 (Youngest Revolutionary to be hanged by British)
- Madam Bhikaji Cama host Indian flag at Stuttgart (Germany) in 1907. She is also known as **Mother of Indian Revolution**.
- HRA – Hindustan Republican Association (1924) founded by Sachindra Nath Sanyal, Ram Prasad Bismill.
- Kakori Train Incident – 9 August 1925. Kakori is located at Saharanpur (UP)
- Ramprasad Bismill, Ashfaqulla Khan, Rajendra Lahiri and Roshan Singh were hanged by British.
- Bhagat Singh and Chandrashekhar Azad formed HSRA – Hindustan Socialist Republic Association at Delhi.
- Bhagat Singh also formed "Naujawan Bharat Sabha"
- Bhagat Singh killed Saunders in 1930. Saunders killed Lala Lajpat Rai during Simon Commission protest.
- Bhagat Singh and Batukeshwar Dutt threw bomb in Central Assembly, Delhi on 8 April 1929.
- Jatin Das died after 63 days of fast unto death in jail
- Chandrashekhar Azad killed himself in Alfred Park Allahabad on 27 February 1931.
- Bhagat Singh, Rajguru and Sukhdev were hanged on 23 March 1931.
- Surya Sen is famous for Chittagong (Bangladesh) Armory Raid in 1930. He was hanged in 1934.
- Kalpana Dutt and Pritilata Wadekar famous females related with Chittagong Armory Raid
- Abhinav Bharat Society established by Vinayak Damodar Savarkar and his brother Ganesh Damodar Savarkar in 1904.

Subhash Chandra Bose and INA – S C Bose born on 23 January 1897 at Cuttack (Odisha).

- Qualify Civil Services at the age of 24 and later left it.
- President of Congress twice in 1938 (Haripura, Gujarat) and 1939 (Tripuri, Madhya Pradesh).
- He founded Forward Block in 1939 after left congress.
- Slogans – Dilli Chalo, Jai Hind and Tum Mujhe Khoon Do, Mein Tumhe Azadi Dunga (Give me blood, I will give you freedom).
- Subhash Chandra Bose call for "Delhi Chalo" slogan from Singapore.
- Autobiography – The Indian Struggle. Political Guru of SC Bose – CR Das
- Died in a plane crash in August 1945 (Taiwan)

Azad Hind Fauz (Indian National Army - INA) –

- Formed by Ras Behari Bose and Captain Mohan Singh in Singapore (1943)
- United by Subhash Chandra Bose in 1943. Azad Hind Fauz took help from Japan.
- INA captured Andaman Islands. Andaman renamed as Shaheed Island and Nicobar as Swaraj Island.
- Laxmi Sehgal was the leader of Rani Jhansi Brigade of INA.
- INA trial – 1945 (Red Fort) – Shah Nawaz Khan, Prem Sahgal and Gurbaksh Singh Dhillon
- Royal Navy Mutiny – 1946

Famous Slogans during Indian Struggle of Independence –

- Inquilab Zindabad – Bhagat Singh
- Do or Die (Karo ya Maro), Hey Ram – Gandhiji
- Bharat Chhodo – Yusuf Mehar Ali
- Simon Commission, Go Back – Lala Lajpat Rai
- Satyameva Jayate – Pt. Madan Mohan Malviya
- Jai Jawan, Jai Kisan – Lal Bahadur Shastri
- Jai Jawan, Jai Kisan, Jai Vigyan, Jai Anusandhan – Narendra Modi
- Swaraj is my Birth right and I shall have it – Lokmanya Tilak
- Sarfarosi ki Tamanna ab Hmare Dil me Hai – Ram Prasad Bismill
- Vijayi Vishwa Tiranga Pyara Jhanda Uncha Rahe Hamara – Shyamal Gupta
- Democracy of the people, For the People, By the People – Abraham Lincoln
- Jai Hind (word coined by Zain-ul-Abideen and widely used by SC Bose)
- Tum Mujhe Khoon Do Mein Tumhe Azadi Dunga – Subhash Chandra Bose
- Aram Haram Hai – Jawaharlal Nehru
- Share Jahan se Acha – Muhammad Allama Iqbal
- Vande Mataram – Bankim Chandra Chattopadhyay (Chatterjee)
- Jai Jawan, Jai Kisan, Jai Vigyan – Atal Bihari Vajpayee.

Governor General and Viceroy of India

- Robert Clive – 1st gov of Bengal, Battle of Plassey
- Warren Hastings – 1st gov gen of Bengal, 1784 Pitt's India Act, Asiatic Society of Bengal
- Lord Cornwallis – Father of Civil Service and Police System in India, only gov gen which resting place in India (Gazipur, UP)
- Lord Wellesley – Subsidiary Alliance, founded Fort William College in Kolkata (1800)
- Lord William Bentick – 1st gov gen of India, Sati System end (1829)
- Lord Dalhousie – Doctrine of Lapse. Satara (1848), Jaitpur and Sambhalpur (1849), Baghat (1850), Udaipur (1852), Jhansi (1853), Nagpur (1854) and Awadh (1856). Awadh was only state was align due to Misgovernance.
- First Railway between Bombay and Thane (1853), Post Office Act, PWD department, Sikkim added in India, Shimla capital.
- Lord Canning – Last gov gen and 1st Viceroy of India, 1857 revolt, widow remarriage act 1856.
- Lord Mayo – 1st census (1872)
- Lord Ripon – Father of Local Self Governance, Ilbert Bill Controversy (Indian Judges trial English), 1st regular census.
- Lord Curzon – Pusa Agriculture University at Delhi, Partition of Bengal
- Lord Hardinge – Capital transfer from Kolkata to Delhi.
- Lord Linlithgow – Quit India Movement
- Lord Mountbatten – 1st gov gen of Free India
- C Rajagopalachari – First and Only Indian Governor General of India.

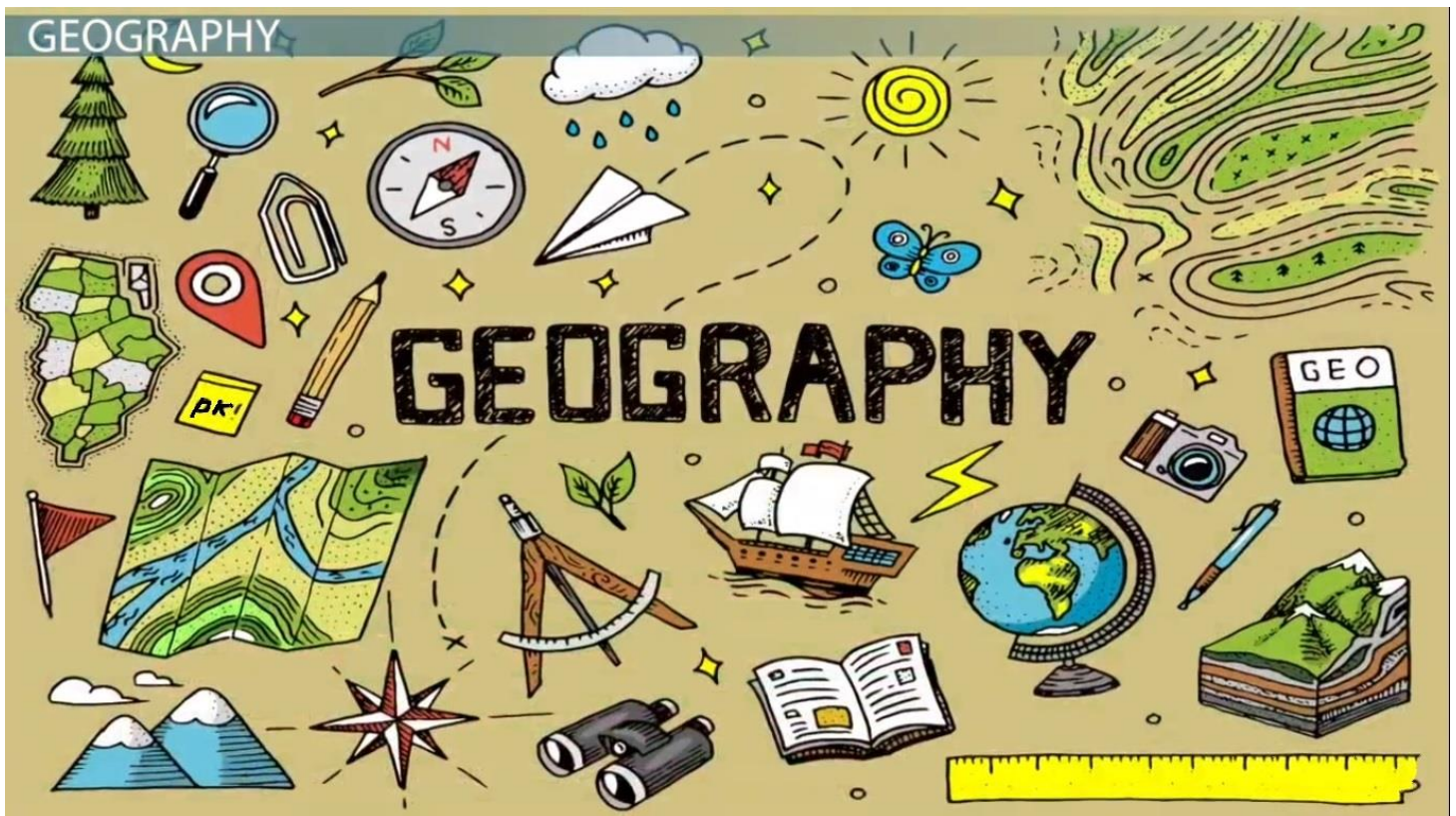
World History –

- **French revolution** – 1789 (Louis XVI)
- **American Independence** – 4 July 1776 from England.
- **First World war** – 28 July 1914 to 11 November 1918.
- The first World War was won by Allies forces of United Kingdom, France, United States, Japan, Italy.
- Losers were Germany, Austria-Hungary, Bulgaria and the Ottoman Empire was from Central Powers
- **Battle of Waterloo** – Napoleon Bonaparte in 1815.
- **Russian Revolution** – 1917 (Vladimir Lenin)

- **League of Nations** – 1920 by Woodrow Wilson (US President). Later known as United Nations.
- **Second World War** – 3 September 1939 to 1 September 1945.
- The Second World War was also won by Allies forces of United Kingdom, France, United States, Russia (USSR) and China.
- Axis powers (Germany, Italy, and Japan) lose second world war.
- Leader of Germany Nazi Party –Adolf Hitler.
- Dictator of Italy – Benito Mussolini.
- Man of Iron and Blood – Otto von Bismarck (Germany)
- Cold War era – 1945-1991 (USA and USSR). USSR – Union of Soviet Socialist Republics
- Non-Align Movement (NAM) – Belgrade (Serbia) in 1961.
- Disintegration of USSR – 1991 (15 countries formed)

India after Independence –

- **Wars** – India and Pakistan- total 4 Wars
- 1947-48 = For Kashmir, Pakistan Lost
- 1965= Operation Gibraltar of Pakistan, Pakistan Lost
- 1971 = Political Battle between India and Pakistan, Pakistan Lost and New Country Bangladesh formed.
- Bangladesh founded on 26 March 1971. Father and founder of Bangladesh was Sheikh Mujibur Rahman.
- 1999 = Kargil War, Pakistan Lost. Kargil located at Jammu and Kashmir. Operation Vijay was codename of Kargil War.
- Indo China war – 1962 = This war was won by China
- **Education** – University Grant Commission (UGC) set up in 1953 by S. Radha Krishan
- Mudaliar Commission by Lakshman Swami Mudaliar in 1952-53 for Middle Schools
- Kothari Commission by Dr. Daulat Singh Kothari in 1964, for Women Empowerment and Primary Education (10+2+3 model)
- National Education Policy in 1968 (Science added and Three Language Formula Hindi, English and Regional)
- National Education Policy in 1986 (10+2+3 model applied and Operation Black Board)
- National Education Policy in 2020 (5+3+3+4 rule applied)
- Mid-Day Meal scheme started in 2005
- NCERT setup in 1961. 1st Educational Board School setup in 1921 at Uttar Pradesh
- First Sainik School was Sainik School, Lucknow in 1960 (but it was not under Sainik School Society)
- Under Sainik School Society 1st Sainik School was Satara Sainik School, Maharashtra, 23 June 1961 by V K Krishna Menon (then Defence Minister of India). V K Krishna Menon also Defence minister during Indo-China war of 1962.
- First Rashtriya Military School (RMS) was setup at Chail (HP) in 1922.
- Later four RMS setup at Ajmer & Dholpur (Both in Rajasthan), Belgaum and Bengaluru (Both in Karnataka).
- RIMC was setup on 13 March 1922 by Prince Edward VIII, Prince of Wales at Garhi Village, Dehradun (Uttarakhand)
- UGC, CAGE, AICTE etc. are related with higher education but NCERT and CBSE related with up to 12th standard.
- Samjhauta Express started on July 22, 1976 between India and Pakistan after Shimla Agreement (1972) India PM Indira Gandhi and Pakistan PM Zulfikar Ali Bhutto. It was finally stopped in 2019.
- Bindeshwari Prasad (BP) Mandal gave the 27% reservations to OBC category in 1979 (PM-Morarji Desai).



World Geography – Father of Geography – Eratosthenes, Ancient Greek scholar

Universe –

- The vast space surrounding us is called the universe. Galaxies, Stars, Planets, Satellites, Comets, Meteors, Dust Particles, Gases, Dark Matters and Black Holes together form Universe.

Big Bang Theory –

- The theory was given by Georges Lemaitre (Belgium) in 1931. Big Bang Theory is about the origin of Universe.
- According to this theory, the universe came into existence around 1380 crore or 13.8 billion years ago. It started as a single point called "singularity."
- Cosmology – The study of Universe.

Galaxy –

- A galaxy is a huge collection of Gas, Dust, and Billions of stars and their solar systems, all held together by gravity. The Universe contains 100 billion galaxies, each of which comprises 100 billion stars.
- Milky Way (Akash Ganga) – Name of the galaxy to which our Earth and Sun belong. It is Spiral in shape.
- Edwin Hubble (USA) in 1924, first demonstrated about the galaxies.
- Andromeda (Messier-31) is our nearest galaxy which is 2.2 million light years away.
- Biggest Galaxy in universe is Alcyoneus (16.3 million Light Year), 2nd Largest is IC-1011.
- The space (distance) between two galaxies is Black or Dark.

Measurement Units –

- Light year – Distance travelled by a light ray in one year. 1 light year – 9.46×10^{12} km or 9.46×10^{15} m
- Speed of light – 300000 km/sec. 1 Parsec or Megaparsec – 3.26 Light Years.
- 1 Astronomical unit (AU) is average or mean distance between Earth and Sun – 14960000 km or 1.496×10^{11} m.
- Smallest unit of distance is Planck Length 1.616×10^{-35} .

Stars –

- Heavenly bodies made up of hot burning gases like Hydrogen and Helium is called star.
- Closest star to our solar system – Proxima Centauri (4.2 light years).
- Brightest star outside solar system – Sirius (Dog Star)
- Supernova – Explosive death of a star i.e., 1.44 times the mass of the Sun (Chandrasekhar Limit)

- If the explosion of a star is more than 1.44 times the mass of our Sun, it will become a Black Hole but if it is less than 1.44 times the mass of our Sun, it will become a Neutron Star.
- Pole Star (Dhruv Tara) is located in North direction and it does not move due to Earth Rotation.

Constellation –

- A group of stars forming various shapes is called Constellation (star patterns). There are 88 constellations.
- Some famous constellations – Ursa major, Orion, Cassiopeia, Leo major.
- Ursa Major is also called Saptarishi (due to seven stars). It is also called Big Dipper or Great Bear (in western countries).
- Ursa Major can be used to find the direction of Pole Star. Orion is in the shape of a 'Hunter'.
- Leo Major is in the shape of a Lion. Cassiopeia is in the shape of English letter W or M.

Solar System –

- Father of Solar System (discoverer)– Nicolaus Copernicus (Poland). He also first discovered that Earth revolves around Sun.
- The solar system comprises the Sun and its eight planets

The Sun – The Sun is in the center of solar system and all the planets revolve around it in elliptical orbit

- It is the nearest star to the Earth. Contains 98% of the total solar system mass. Hydrogen and Helium are the main gases present in the Sun. Sun converts hydrogen into helium in its core. It is called Nuclear Fusion.
- All changes in weather of the earth are caused by Sun. Age of the sun 5 billion years.
- The glowing part of the Sun that we can see is known as Photosphere
- Corona – The outermost layer of the sun visible during solar eclipse.
- Solar Flares (Northern & Southern Lights) are originating due to Sun Spots (Sun Kalank) which appear every 11 years
- In North Pole, Solar Flares are called Aurora Borealis & in South Poles it is called Aurora Australis.
- Surface temperature of the Sun is 6000°C and Core Temperature is 15 million °C.
- Temperature of Sun is measured by – Pyrometer. Distance between Earth and Sun – 15 crore km
- Time taken by sunlight to reach earth is about – 8 minutes and 16-20 sec (changed by time to time)
- **Perihelion** – Nearest distance between Earth and Sun (14 crore and 70 lakh km) on 3 January.
- **Aphelion** – Farthest Distance between Earth and Sun (15 crore 20 lakh km) on 4 July
- NASA (USA) Parker Solar Probe Mission related with Sun in 2018.
- ISRO (India) 1st Solar Mission is **Aditya-L1**. L is Lagrangian points. These are the parking place between Earth and Sun.
- There are 5 Lagrangian points between Earth and Sun.

Planets (Graha) –

- All the eight planets of solar system move around the Sun in fixed paths. These paths are called **Orbits**.
- Inner Planets – Mercury, Venus, Earth, Mars. Also known as Terrestrial Planet.
- Inner planets are made of rocks. So, it is also known as Rocky Planets. They have very few Satellites or Moons.
- Outer Planets- Jupiter, Saturn, Uranus, Neptune. They have a ring system around them.
- Outer Planets are made of gases and dust, also called Jovian planets.
- Planets rotate from west to east except Venus and Uranus

Mercury (Buddha) – Smallest and nearest planet to the Sun. Innermost planet in Solar System to Sun.

- Fastest Revolution around Sun (88 days) or Swiftest Planet.
- Second highest density after Earth. No satellite of Mercury.
- NASA's Mariner 10 and MESSENGER missions have explored Mercury.

Venus (Shukra) –

- Greenhouse gas Carbon Dioxide (CO₂) is found on Venus. It is about 97%.
- Brightest Planet. Nearest planet to Earth.
- Morning Star, Evening Star.
- Earth's Twin or Earth Sister.
- Rotation Time – 243 days, Revolution Time 225 Days. Hence, its one day is bigger than its one year.
- Venus got named after the Roman goddess of love and beauty. It's the only planet named after a female god.
- Magellan Mission (NASA) related with Venus.

Earth (Prithvi) – Third planet from the Sun and the fifth largest planet of Solar System.

- Only known Planet where life exists. Shape is Geoid or oblate spheroid.
- Densest Planet or Highest Density i.e., 5.51 g/cm³

- 'Blue Planet' due to the presence of water. Also known as Water Planet. Moon or Chandrma is the only satellite

Mars (Mangal) – Name given on the Roman God of War

- Red Planet (due to the presence of Iron Oxide or Ferrous Oxide).
- Mount Olympus on Mars is the highest mountain in Solar system (3x from Mt. Everest)
- Two satellites – Phobos and Deimos. (Deimos is smallest Satellite in Solar System). Rotation speed – 24 Hours.
- Most similar planet of earth is Mars. One year on Mars 687 Days and A Day is 40 Minute longer than Earth
- Viking-I & II (1976, NASA) first spacecraft to visit Mars.
- Hope (UAE), Tianwen-I (China), Mars Orbiter Mission (MOM, India), Mariner (NASA) also sent to Mars.
- NASA's Perseverance Rover & MAVEN Mission also related with Mars

• **Note:** – Asteroid Belt is lies between Mars and Jupiter.

Jupiter (Brihaspati) –

- Also known as Gas Giant Planet with Great Red Spot planet. The largest planet in the Solar System with no solid surface
- Also known as Master of Gods due to its Big Size. Fastest Rotation speed – 9 Hours and 56 Minutes.
- Ganymede satellite is largest in solar system, Calisto, Europa, Io are famous satellites of Jupiter.
- Maximum Gravity (2.4 times than Earth), Maximum Escape Velocity in Solar System (59.6 km/s)
- Juno Mission (2011) and Voyager-1 Mission of NASA related with Jupiter
- Satellites of Jupiter- 95

Saturn (Shani) – Second Largest Planet in Solar System. Color of Saturn is Yellow due to presence of Ammonia.

- Surrounded by rings made up of gas and dust. Least Density – 0.6 (it can float on water).
- Total satellites- 146 (Highest in Solar System). Titan, Mimas are satellite of Saturn
- Cassini Mission related with Saturn

Uranus (Arun) – First planet to be discovered with the help of a telescope by William Herschel in 1781.

- It is inclined at 98° (97.77°). It actually rolls from north to south.
- 27 satellites. Rotate East to West (Like Venus). Green color due to presence of Methane.
- Voyager 2 is the only Mission (NASA) related with Uranus.

Neptune (Varun) – The farthest planet from the sun. First planet discovered after mathematical calculation.

- Slowest revolution speed around sun – 164 years. Also known as Sleeping Planet. 14 satellites.
- On 24 August 2006 the International Astronomical Union reclassified Pluto as Dwarf Planet.

Pluto (The Dwarf Planet) – Discovered in 1930 by Clyde Tombaugh. Largest Dwarf Planet in Solar System.

- New Horizons Mission (NASA) related with Pluto.
- **Other Dwarf Planet** – Ceres (Lies in Asteroid Belt), Eris, Makemake and Haumea

Note: End of Solar System is known as Kuiper Belt near Oort Cloud.

The Moon (Only Natural Satellite of Earth)

- Soil of Moon is known as **Regolith**. Study of Moon is called – **Selenology**
- Mean distance from Earth – 3,84,400 km.
- Time taken by moon light to reach Earth – 1.3 second. No Atmosphere on Moon.
- Rotation and Revolution speed are same – 27.3 Days
- Part of moon visible from earth – 59% and Non-Visible Part is – 41%.
- Neil Armstrong and Edwin Aldrin were the first to reach Moon on 21 July 1969.
- Sea of tranquility (Shaant Sagar) is a part of Moon due to Apollo-11 landing site.
- **Perigee** – Nearest distance between Earth and Moon (363300 km).
- **Apogee** – Farthest distance between Earth and Moon (405500 km).
- When two Full Moons occur in a single month, the second Full Moon is called a **Blue Moon**.
- When full moon occurred and moon is nearest to Earth (Perigee

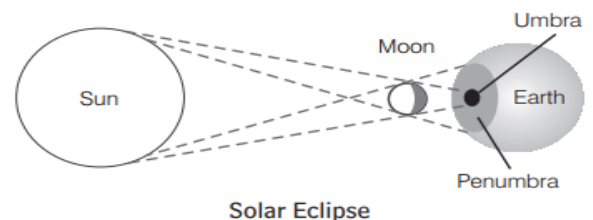
Full Moon) is known as **Super Moon**.

- In this position size of moon increased by 14% and 30% brightest than other days.

Eclipse (Grahan) –

- There are Two types of eclipse – Solar Eclipse and Luner Eclipse.

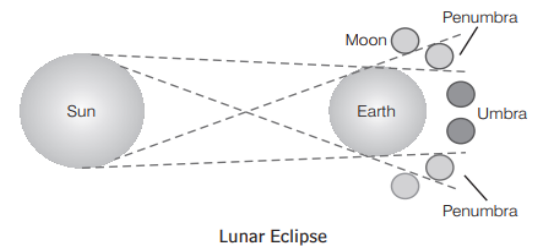
Solar Eclipse (Surya Grahan) –



- It occurs only on Amavasya or New Moon Day.
- When the Moon comes in between the Sun and the Earth, the light of the Sun is interrupted and shadow of the Moon falls on the Earth.

Lunar Eclipse (Chandra Grahan) –

- It occurs only Poornima or Full Moon Day.
- When the Earth comes in between the Sun and the Moon, the light of the Sun is not able to reach the Moon. The inner shaped part of the shadow is called **Umbra** and the outer light part is called **Penumbra**.



Comets –

- They revolve around sun in highly elliptical orbit. It has a tail which always points away from the sun.
- Halley's comet appears after every 76 years. Last appeared in 1986. Next appearances 28 July 2061.

Meteors and Meteorites – Meteors are very small stone-like objects that are revolving around the Sun.

- Also known as Shooting Stars. When Meteors enter the Earth's atmosphere (in Mesosphere) they start burning due to friction.
- The burnt part which falls on Earth is called meteorite.

Asteroids – Numerous tiny heavenly bodies between the orbits of Mars and Jupiter which revolve around Sun.

- Ceres, Vesta, Pallas, Hygiea and Bennu are famous asteroids.

The Earth –

- Age of the Earth – 4.6 billion years.
- Equatorial Diameter – 12756 km
- Equatorial Circumference – 40075 km
- Surface Temperature = -88°C to 58°C
- Earth's Atmosphere – Nitrogen (78.08%), Oxygen (20.95%), Argon (0.93%) and Carbon dioxide (0.036%)
- Earth's Orbital Speed around Sun 29.8 km/sec. Earth takes $365\frac{1}{4}$ days to revolve around sun.
- Rotation is when Earth or other planet spin on its own Axis – 23 hours, 56 minutes, 4.09 seconds. (Day/Night)
- Revolution is Earth and other planet revolves around sun in Elliptical orbit – 365 days, 5 hours, 48 minutes. (Year/Season)
- Water – 70.8%, Land – 29.2%
- Major elements in the Earth crust are – Oxygen (46.6%), Silicon (27.7%), Aluminum (8.1%), Iron (5%)
- **Equinox** – When duration of day and night is equal on Earth. Only two Equinox in a year – 21 March and 23 September.
- **Solstice** – Total two in a year.

– **Summer Solstice** – 21 June (Longest Day & Shortest Night of the Year in Northern Hemisphere)

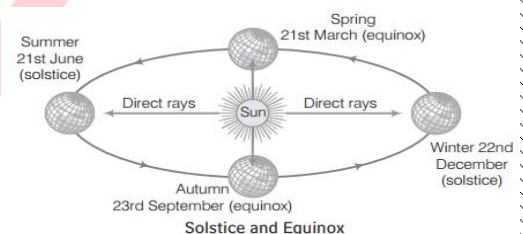
– **Winter Solstice** – 22 December (Longest Day & Shortest Night of the Year in Southern Hemisphere)

Latitudes (Leti Hui Lines) –

- The model of the earth is called Globe. A network of horizontal and vertical lines or latitudes and longitudes drawn on a map or globe is called **Grid**.
- Latitude is a point's angular distance North or South of the equator
- **Equator** – The imaginary line which divide Earth in two equal parts – Northern Hemisphere and Southern Hemisphere.
- Latitudes are the lines parallel to the equator. So, another name of Latitudes is Parallels.
- Latitudes run from east to west and never meet each other. Equator is 0° latitude. It is largest latitude (40075 km)
- Tropic of Cancer (Kark Rekha) – 23.5° or $23\frac{1}{2}^{\circ}$ North (N). Tropic of Capricorn (Makar Rekha) – 23.5° or $23\frac{1}{2}^{\circ}$ South (S).
- Arctic Circle – 66.5° N. Antarctic Circle – 66.5° S. North Pole – 90° N. South Pole – 90° S.
- Distance between two latitudes – 111 km (69 Miles)
- Total latitudes – 179° (89° in North+ 89° in South+ 1 Equator) * According to NCERT
- Latitudes decide Climate, Weather, Ocean Currents and Temperature.
- Sun shines on Equator throughout the year. Sun also shines between Tropical Zone.
- 30° to 35° in both hemisphere is known as **Horse Latitude**.

Longitudes (Long Lines or Lambi Lines) –

- Longitude (Meridians) are imaginary lines extending from poles to poles which cut equator.



- Longitudes are semi-circle. Total Longitudes – 360. The distance between two line of longitudes is maximum at Equator.
- 0° Longitude is known as Prime Meridian is define relative East/West positions of a point on the globe or map.
- 0° longitude is also known as the **Greenwich Line**, passes through Greenwich, in London (UK)
- World's every country time is set from Greenwich Mean Time (GMT) from 1884.
- East side from GMT time will be in + and West side from GMT time is in –.
- Indian Standard Time is +5:30 hours from GMT (82.5° East).
- In 1972 GMT was replaced as UTC (Universal Coordinated Time).
- 1° = 4 minutes, 15° longitude = 60 Minutes (1 Hour), 15° x 24 Hours = 360° longitudes.
- International Date Line (IDL) is known as 180° longitude. Established on 1884.
- IDL is passes through Bering Strait, Pacific Ocean and Arctic Ocean
- Day changes at International Date Line (IDL). IDL curves 8 times and never cross any country. It is zig-zag in shape.
- Left side from IDL – Gain One Day. Right side from IDL – Loss One Day.
- Only continent where Equator, tropic of cancer, Capricorn and Prime meridian passes- Africa
- There are 24 Time Zones in the world. Father of time zones is Sir Sandford Fleming.
- France, including its overseas territories, has the most time zones with 12
- Russia has 11 time zones. USA, Canada has 5 time zones each.
- 0° Latitude and 0° Longitude cross each other at Null Island in South Atlantic Ocean.
- Quito (Ecuador) is lies very near to Equator (15 Miles). Kampala (20 Miles).

Earth's Interior (Average density of Earth is 5.5g/cm³) –

The Crust – Outermost layer of Earth. Less than 1% of Earth volume.

- 10-50 km thin. (More in continents and less in oceans)
- Crust is made up of Silicon + Aluminum (SiAl).
- SiAl density is low, so it is float on SiMa.
- Most abundant element in the Earth Crust – Oxygen.

The Mantle – Intermediate layer. Thickness- 2900 km.

- Mantle is made up of Silicon + Magnesium (SiMa)
- Upper Mantle is known as Asthenosphere (till 400 km).

Magma is filled here. Magma is source of Volcano.

When Magma out from earth through volcanic eruption, is known as Lava.

- 83% of Earth is mantle. Biggest part of Earth interior is Mantle.

The Core – Densest part of the Earth

- Innermost layer. Also known as Centrosphere. Approx 16% of Earth Volume.
- About 3500 km radius. Divide on Outer and Inner Core.
- Mainly contains – Nickel + Ferrous (Iron) is known as NiFe.
- Temperature –600° – 5000 °C

Layers of the Atmosphere –

Troposphere – Nearest layer to Earth surface. Life exists in Troposphere.

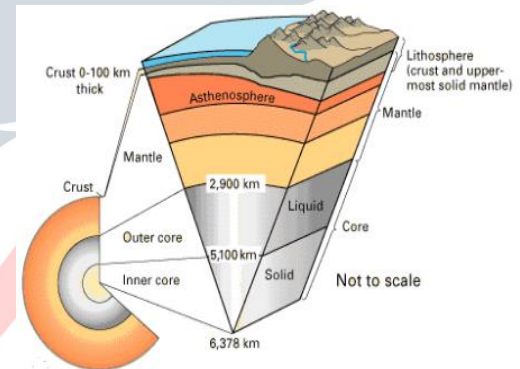
- Thickness of the layer – 0-15 km (8 km near poles and 18 km at the equator).
- All weather phenomena like Cloud, Dew, Frost, Rainfall, Hailstorm, Lightning, Cloud Thunder, Fog occurred in this layer.
- Troposphere contains about 75% of the total gaseous mass of the atmosphere.
- Temperature decreases with increasing height in troposphere @ of 6.5°C per 1000 m or 1°C per 165 m.

Stratosphere – 15-50 km thickness. Due to cloud free, Airplanes and Jet Aircrafts fly in stratosphere.

- Ozone layer (O₃) is situated in stratosphere (20-35 km).
- Ozone layer protect us from harmful ultraviolet radiations (UV-Rays) of Sun.
- Ozone measurement unit is Dobson Unit.
- Montreal Protocol (Canada, 1987) and Kigali (Rwanda, 2016) are related with Ozone Depletion.

Mesosphere – Coldest layer of atmosphere. 50-80 km thickness.

- Meteoroids or shooting stars burn in this layer.



Ionosphere or Thermosphere –

- International Space Station is in this layer. 80-640 km thick.
- It contains electrically charged ionized particles, so Radio Communication occurs in Ionosphere.
- Phenomena of Aurora's generated in this layer- Aurora Borealis (NP) & Aurora Australis (SP)

Exosphere – Outermost or Uppermost layer about 640-10000 km thick.

- Gravity and Atmosphere end here. Hydrogen, helium gases are found here
- Water Vapors, Carbon Dioxide, Methane, Nitrous Oxide, Ozone are greenhouse gases.

Hydrosphere – 70.8% of Earth's surface contains water. About three-fourth of the Earth's surface is covered with water.

- Water is also called "Universal Solvent" because it is capable of dissolving more substances than any other liquid.
- Water Cycle is also known as Hydrologic Cycle. A Hovercraft is a vehicle, capable of travelling over land and water both.
- Depth of Sea / Ocean is measured in Fathom (1 Fathom = 6 feet or 1.8288 m)
- Nautical Mile (NM) – A unit for measuring distance at sea (1 NM = 1.852 km)
- There are 5 major oceans – Pacific, Atlantic, Indian and Arctic and Antarctic Ocean.

Pacific Ocean (Prashant Mahasagar) –

- Pacific Ocean is the Largest and Deepest Ocean. 'Ring of Fire' is associated with Pacific Ocean.
- About 1/3 of total earth surface is Pacific Ocean and about 50% water of the entire world oceans.
- Mariana Trench (11033 meters) in Challenger Deep is the deepest point of the earth in ocean.
- El- Nino and La-Nina phenomena is occurred in Pacific Ocean (Near Peru-Chile)
- El- Nino means "The Little Boy", temperature near Peru and Chile coast rise approx. near 25 December
- La- Nina means "The Little Girl", temperature eastern pacific colder than normal.

Atlantic Ocean (Andh Mahasagar) –

- Atlantic is the 2nd Largest and the Busiest Ocean. 'S' shape ocean.
- Located between North & South America (in west) and Europe & Africa (in east)
- Sargasso Sea (the only sea on earth without a land border) is located in North Atlantic Ocean.
- Bermuda Triangle is located in North Atlantic Ocean. Titanic Ship was sunk in North Atlantic Ocean.
- 20% of earth surface is covered by Atlantic. Mid-Atlantic ridge (14500 km) is related with Atlantic Ocean.
- Deepest point- Puerto Rico Trench

Indian Ocean (Hind Mahasagar) –

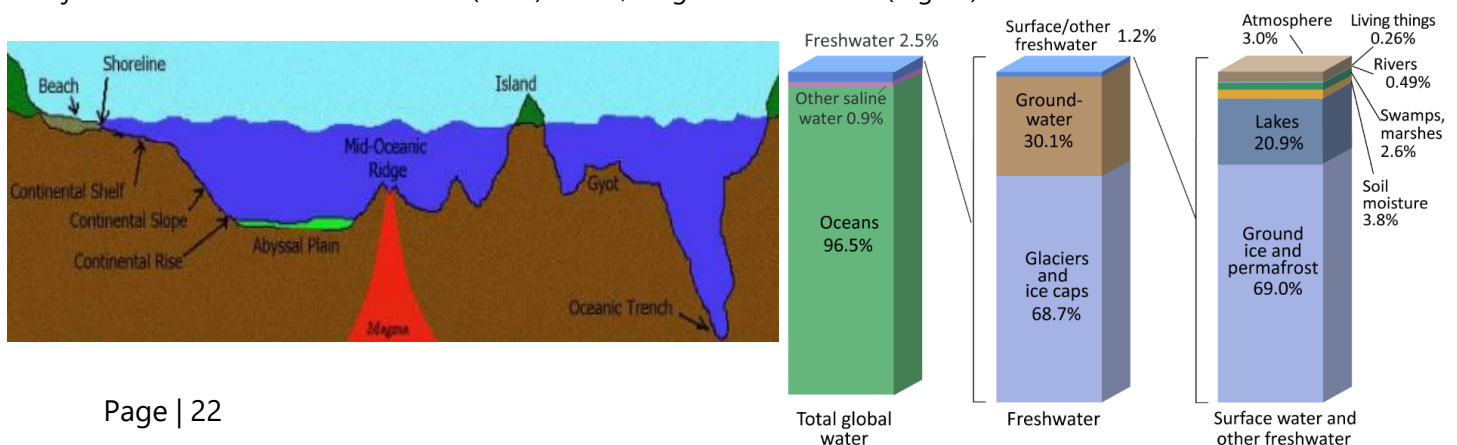
- The only ocean got name from a country i.e., India.
- Madagascar and Sri Lanka are in Indian Ocean. Madagascar is largest island of Indian Ocean.
- Bay of Bengal, Arabian Sea and Indian Ocean meets at Kanyakumari (Cape Comorin), Tamil Nadu.
- Deepest point – Java Trench

Arctic Ocean (Arctic Mahasagar) –

- Arctic is the Smallest Ocean (About 3% of total earth surface) and almost frozen.
- Siberia (Russia) is very near to Arctic Ocean.
- Arctic Ocean is connected to the Atlantic Ocean by the Greenland Sea & Pacific by Bering Strait.
- Deepest Point – Molloy Hole

Southern or Antarctic Ocean (Dakshini Mahasagar) –

- Fifth ocean from 8 June 2021 by National Geographic magazine.
- Only ocean that touch three other oceans- Pacific, Atlantic and Indian Ocean.
- Started from 60° S latitude and encircling Antarctica
- Deepest Point- South Sandwich Trench.
- Major salt in ocean- Sodium Chloride (NaCl) 77.8%, Magnesium Chloride (MgCl₂) 10.9%.



Continental Drifting Theory – This theory was given by Alfred Wegener (Germany) in 1912.

- According to theory All land on Earth at same place named Pangea. The water on Earth was known as Panthalassa.
- In the Centre of Pangea, A sea was named – Tethys Sea.
- Later in Carboniferous era Pangea divided into Angara land (Upper Part) and Gondwana Land (Lower Part). India was the part of Gondwana Land.

Continental Plates – Seven big Plates on Earth – Eurasian Plate, African Plate, North American Plate, South American Plate, Antarctic Plate, Indo- Australian Plate and Pacific Plate.

- Peninsular India, Australia and Indian Ocean are part of Indo-Australian Plate.
- Three type of plate system –
 - A- Divergent Plate – New Land Formed (Constructive Plate)
 - B- Convergent Plate – Land Lost (Destructive Plate)
 - C- Transform Plate – Parallel to each other plate (Parallel movement of plates)

Lithosphere (29.2% of total earth surface) –

- There are 7 continents– Asia, Africa, North America, South America, Antarctica, Europe and Australia.

Asia – Also known as Continent of Diversity. Total Countries- 48

- Largest and Most Populous continent by area.
- Area- 44,444,100 sq km.
- World Area- About 29.5%, World Population- About 60%.
- Largest Country by Area- 1st Russia, 2nd China, 3rd India. Smallest Country by Area- Maldives
- Biggest Country by Population- India, China. Smallest Country by Population- Maldives
- Longest River- Yangtze River, China (6300 km)
- Highest Place- Mount Everest (8848.86 m), Lowest Place (on Land)- Dead Sea or Salt Sea (–427 m)
- Biggest Lake- Caspian Sea Lake (Turkmenistan, Azerbaijan, Russia, Iran and Kazakhstan) TRICK- **TARIK**
- India is lies in Asia Continent.
- India, Nepal, Bangladesh, Pakistan, Bhutan, Sri Lanka, and Maldives are known as Indian Sub-Continent.
- Pamir Knot (Roof of the World) is in Asia Continent.

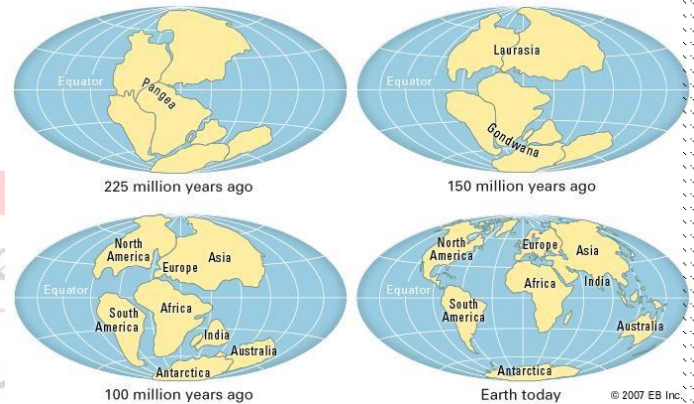
Africa (Dark or Black Continent) – Also known continent of Plateaus. 2nd largest continent.

- Africa has the highest number of countries (54 nations)
- Largest country by Area- Algeria and Smallest is Seychelles.
- Only continent which is crossed by the Equator, Tropic of Capricorn and Tropic of Cancer.
- Only continent where the 0° latitude meets the 0° longitudes i.e., Null Island in Gulf of Guiana.
- Highest Mountain Peak- Mount Kilimanjaro, Tanzania (5895 m)
- Biggest Desert- Sahara, Northern Africa (11 Countries), 9.2 million sq. km
- Largest Lake- Lake Victoria (Tanzania, Uganda and Kenya)
- Eritrea country (capital – Asmara) is located in Africa continent.

North America – Discover by Christopher Columbus (Italy) in 1492. North America is also known as “New World”.

- Amerigo Vespucci (Italy) gave it name to America in 1507.
- Largest country by Area – Canada, Smallest country - Saint Kitts and Nevis
- Highest Peak – Mount McKinley (6194 m) in Alaska Range, USA
- Longest River – Missouri River, 2nd Longest is Mississippi River.
- Biggest Desert – Chihuahuan Desert (Mexico and USA)
- Largest Lake – Lake Superior (World's largest freshwater lake by area), 82100 sq km
- Five great lakes in Canada and USA – Superior, Michigan, Huron, Erie and Ontario
- USA is known as Bread Basket of the World.
- Longest coastline of the world – Canada (243042 km)
- Largest gulf of the world – The Gulf of Mexico, Mexico (5000 km)
- Atlantic, Pacific, and Arctic oceans surround North America in the East, West, and North respectively

South America – Fourth largest continent of the world.



- Atlantic Ocean in the East and Pacific Ocean in West.
- Total Countries – 13, Largest – Brazil, Smallest – Suriname.
- Longest mountain range of the World – Andes (7 countries), 7200 km
- Highest Peak – Mt. Aconcagua (Argentina-Chile Border), 6962 m,
- Longest River – Amazon River (6400 km), Largest Lake- Lake Titicaca (Bolivia & Peru)
- Highest volcano of the world – Ojos del Salado (Argentina-Chile), 6893 m
- Brazil is the only country that passes through both the Equator and Tropic of Capricorn

Antarctica – Also known as Continent of Science. Located below equator in southern hemisphere.

- Fifth largest continent and always covered with ice. Completely lies in Southern Hemisphere.
 - Antarctica has no population. Antarctica is coldest among all seven continents.
 - Dakshin Gangotri (1983) was first research Centre of India in Antarctica.
 - Maitri (1989) was 2nd and first permanent research station in Antarctica of India. Bharti (2012) newest station of India.
 - Sagar Nidhi, first ice class vessel of India for research in Antarctica.
 - Antarctic Treaty was signed in 1961 and adopted on 1 December 1989 (India become member in 1983)
 - Total members – 54 countries, HQ of Antarctic Treaty – Buenos Aires, Argentina
 - Highest Peak – Mt. Vinson Massif (4982 m). Mount Erebus, Mount Sidley are active volcano of Antarctica.
- Europe (44 Countries)** – Europe is the second smallest continent. Also known as Peninsula of Peninsulas.
- It is separated from Asia by Ural Mountain, Caspian Sea, Caucasus Mountain and Black Sea.
 - Largest Country- France, Smallest Country- Vatican City
 - Highest Peak- Mont Blanc (4804 m) in Alps and Mt. Elbrus (5633 m) in Caucasus Range.
 - Longest River- The Volga (3531 km). Continent Doesn't Have a Desert – Europe.

Australia –

- Smallest Continent. Australia is also known as Land Down Under. Discovered by James Cook (England) in 1770.
- Also known as Island continent. Another name is Oceania. Located between the Indian and Pacific Oceans
- Australia has the world's largest known uranium reserve.
- The Tropic of Capricorn cuts the continent almost into half. Nearest continent- Asia
- Only continent got name from a country.
- Gibson, Great Sandy, Simpson and Great Victoria are major desert in Australia continent.
- Great Dividing Range is located in eastern part of Australia.
- World longest and Largest Great Barrier Reef (1900 km long) located in Pacific Ocean.
- Australia is only continent to celebrate Christmas in Summer.
- Longest River- Murray (2508 km). Highest Peak- Mount Kosciuszko (2228 m)

Volcano –

- When molten material (Magma) erupt from Earth Crust suddenly is known as Volcano.
- Erupted material on land is known as Lava.
- Source of Lava and Magma is Asthenosphere (Upper Mantle).
- Three types of Volcanos – Active (0-50 Years), Dormant (50-300 Years) and Extinct (300+ Years)
- Pacific Ring of Fire is known as its Volcanoes Eruption and Earthquakes.
- USA have the most Volcanoes. 2nd- Japan, 3rd- Indonesia.
- 60-90 % emitted during a volcanic eruption are Water Vapor (H₂O). Rest is CO₂ and SO₂.
- Crater is a bowl- or funnel-shaped pit at the top of a volcanic vent. Lonar (Maharashtra) is a Crater Lake.
- Lake Toba (Sumatra) is largest crater lake in the world.

Major Volcanoes of the World –

Note: Only active volcano of India is Barren (Andaman & Nicobar Island). Narcondam in A&N Island is Dormant.

- | | |
|--|--|
| • Stromboli (Italy) is known as the Light House of Mediterranean Sea (erupt every 30 minutes). | • Mt. Kilauea, Mauna Loa (Hawaii Island) : USA |
| • Ojas Del Salado (World Highest) – Argentina-Chile | • Mt. Etna (Sicily), Vesuvius, Stromboli – Italy |
| • Cotopaxi, Sangay, Chimborazo – Ecuador | • Krakatoa, Merapi, Toba (Sumatra) – Indonesia |
| • Erebus – Antarctica | • Fujiyama – Japan |
| • Kilimanjaro – Tanzania | • Mt. Popa – Myanmar |
| • Koh Sultan – Baluchistan, Pakistan | |

Earthquake – An intense shaking of Earth's surface and Earth Crust is known as earthquake.

- Seismology – Study of earthquake. Those who study earthquakes are called Seismologist.
- Seismograph – Device used to measure Earthquake
- Caused due to Plate Tectonic and Volcanic Eruptions.
- Intensity of earthquake is measured by Richter scale (Ranges Value- 0-10)
- Earthquake more than 7 can cause destruction and displacements.
- Mercalli Scale – Measure after destruction by earthquake (Ranges Value – 1-12)
- India has Four Seismic Zones. India's about 59% area is affected by earthquakes.
- Focus – The Point in earth crust where earthquake originates
- Epicenter – The Point on earth surface (90° above focus) from where earthquake spreads
- Radon Gas concentration is increased in environment just before earthquake
- Seismic have three types– P Waves, S Waves and L Waves.
- Tsunami – Earthquake and Volcano Eruption under water causes Tsunami.
- Tsunami is a Japanese Word means Harbor Waves or Tidal Waves or seismic sea wave
- Square waves or Pattern occurs on surface of ocean after Tsunami.

Rock and Rocks System – Geosphere (solid portions of Earth) includes internal rocks, minerals, soils, sediments etc. on Earth
Three types of Rocks–

- **Igneous Rocks** – Formed due to Volcanic Eruption. Original Rocks, Primary Rocks, Basic Rocks.
- No Fossils and Layers found. Deccan Trap is made up of Igneous Rock.
- Maximum minerals found in Igneous Rocks. Iron, Copper, Tin, Mica, Cobalt etc.
- Example – Granite, Diorite, Basalt, Gabbro etc.
- **Sedimentary Rocks** – Formed erosion and deposition of igneous and metamorphic rocks.
- Fossils are found. Petroleum and Coal is found in Sedimentary Rocks.
- Spread out about 75% area of the crust, but they contribute only 5% in the formation of the crust.
- Example – Limestone, Sandstone, Chalk, Potash, Shale, Loess, Gypsum, Coal etc.
- **Metamorphic Rocks (Means change of form)** –pressure, volume and temperature changes due to high heat and pressure.
- Metamorphic rocks arise from the transformation of existing rock.
- Example – Coal into Diamond (Coal also convert into Graphite), Clay & Shale into Slate, Limestone into Marble, Granite into Gneiss, Sandstone into Quartzite etc.

Famous Mountain Ranges of the World –

- **The Andes** – Located on Western Coast in South America Continent
- Longest Mountain Range of the World (About 7200 KM long)
- Highest Peak – Mt. Aconcagua- 6962m (Argentina)
- World Highest volcano Ojas Del Salado (Argentina- Chile Border) located in Andes Range
- **The Rockies** – Located on Western Part in North America Continent. Highest Peak- Mt. Elbert- 4399m
- **Atlas Range** – Located in Western part of Africa. Highest Peak – Toubkal. Formed when Africa and Europe Collides.
- **Himalaya Mountain Range** – Located in Asia Continent. Highest Mountain range of the world (Average height 6100 m)
- Highest peak – Mount Everest (8848.86 m, Nepal-China). Newest mountain range of the world is Shivalik in Himalaya.
- **Appalachian Mountains** – Canada and USA, North America
- **Arakan Yoma** – Myanmar, Asia
- **Hindukush Mountains** – Pakistan and Afghanistan, Asia
- **Caucasus Mountain** – Europe & Asia. Mediterranean Sea is very near it. So, it divide Europe & Africa.
- **The Great Dividing Range** – Australia
- **The Urals** – Western Part of Russia. Separate Asia and Europe
- **Altai Range** – Siberia Region, Central Asia. Also known as Golden Mountain
- **Alps** – Europe

Cyclones – Rapid inward air circulation around a low-pressure area is known as cyclone.

- Moving Anti-clockwise in Northern Hemisphere and Clockwise in Southern Hemisphere.
- Two types of cyclones – Tropical and Temperate.

- Temperate cyclones are formed 30-60 degrees in both hemispheres.
- Eye of the cyclone has high temperature and low pressure in the centre of cyclones. This area is rain free.
- **Typhoon** – South China sea and Pacific Ocean
- **Tornado** – USA
- **Hurricane** – West Indian islands in the Caribbean Sea and Atlantic Ocean
- **Cyclone** – Indian Ocean Region
- **Willy Willies** – Australia

Blowing of Winds – The movement of air from the high-pressure area to the low-pressure area is known as Winds.

- Three type of winds – Permanent or Prevailing Winds, Seasonal Winds and Local Winds.
- Permanent or Prevailing Winds – Trade Winds (Easterlies), Westerlies and Polar Winds
- Seasonal Winds – Monsoon Winds, Land Breeze & Sea Breeze and Valley Breeze & Mountain Breeze

Local Winds –

- **Bora (Cold)** – Italy and Mid Europe
- **Foehn** – Europe
- **Loo (Hot)** – India & Pakistan
- **Santa Ana** – California, USA
- **Norwester (Hot)** – New Zealand
- **Blizzard or Buran** – Siberia and Poles
- **Sirocco** – Europe and Africa (Khamsin in Egypt)- Blood Rain occurs due to Sirocco
- **Chinook (Hot), Snow Eater** – Rocky Mountain, USA
- **Harmattan (Doctor Wind)** – Africa
- **Mistral** – France, Europe
- **Black Roller** – North America Continent
- **Yamo** – Japan
- **Brickfielder** – Australia

Deserts and Famous Desert of the World –

- Deserts are arid ecosystems that receive fewer than 25 centimeters (10 inches) of rainfall in a year
- Biggest (Largest) and Hottest desert of the world is- Sahara (Northern Africa)
- Driest desert of the world is- Atacama (South America). Coldest desert of the world is- Gobi (Mongolia, Central Asia)
- Most civilized desert of the world is – Thar (India and Pakistan, Asia)
- Oldest desert of the world is- Namib desert (Southern Africa)
- Antarctica and Arctic are also desert.
- **Sahara** – Northern Africa
- **Dasht-E-Lut** – Iran
- **Taklamakan** – China
- **Kalahari** – South Africa, Botswana, Namibia
- **Great Basin, Colorado, Mojave** – USA
- **Thar** – India & Pakistan
- **Gobi** – China and Mongolia
- **Atacama** – Chile and Argentina
- **Patagonia** – Argentina
- **Arabian** – Arabian Peninsula (Middle East)
- **Sonoran** – USA and Mexico
- **Sandy, Gibson, Simpson Great Victoria** – Australia

Famous Grasslands of the World and India –

- Grasslands are generally open and continuous, fairly flat areas of high grass.
- Most of the grasslands of the world are found in the temperate zone.
- Napier Grass (Elephant Grass) is found in Africa and South-East Asia.
- Lemon grass (Cymbopogon flexuosus) is natural mosquito and House Fly repellent.
- Savannas are another name for tropical grasslands
- Pampas, Prairie, Veld, Steppe, and Down are examples of temperate grasslands
- Indian Grassland is Savanna Types vegetation.

Grassland in Worlds –

- **Pampas** – Argentina
- **Pustaz** – Hungary
- **Veld** – South Africa
- **Taiga** – Europe and Asia
- **Prairies** – USA
- **Downs** – Australia
- **Savanah** – Africa and Australia
- **Llanos** – Venezuela (South America)
- **Steppe** – Europe and North Asia
- **Campos** – Brazil (South America)
- **Canterbury** – New Zealand
- **Grasslands (Gaucher)** – India

Grassland in India –

- **Marg or Bahaks** – Jammu and Kashmir
- **Bugyal, Payar, Dzukou** – Uttarakhand
- **Saramati** – Nagaland
- **Shola** – Western Ghat (Keralam, Karnataka and Tamil Nadu)
- **Ukhrul** – Manipur
- **Khajjar** – Himachal Pradesh
- **Banni and Virdi (Virdi)** – Rann of Kutch, Gujarat

Important Lakes of the World – World Deepest and Biggest Lake (By Volume) – Lake Baikal (Siberia, Russia)- 1637 m

- Lake Baikal is also known as Sacred Sea. It is also world oldest lake.

- World largest lake (by Area)- Caspian Sea Lake (Turkmenistan, Azerbaijan, Russia, Iran and Kazakhstan)
- World Lowest Lake (from Sea Level) – Dead Sea (Salt Sea) between Israel and Jordan.
- Dead Sea is also considered as the saltiest water body in the world.
- Longest lake of the World – Lake Tanganyika, Africa Continent (Tanzania, the Democratic Republic of Congo, Zambia and Burundi)- 660 km. World 2nd deepest lake.
- World highest lake – Pumoyong Tso (Tibet, China)
- World highest navigable lake – Titicaca (Peru and Bolivia, South America continent)
- World largest freshwater lake – Superior Lake (USA and Canada)
- Great Lakes is located in North America Continent (Between USA & Canada). Names- Superior, Michigan, Huron, Erie, and Ontario (From Left to Right)
- Caspian Sea, Dead Sea and Aral Sea are lakes.
- Finland is known as The Land of the Thousand Lakes or Garden of Lakes.
- Lake Huron have Manitoulin Island, the world's largest lake island.
- **Eyre** – Australia
- **Aral Sea** – Kazakhstan and Uzbekistan
- **Urmia** – Iran
- **Finger Lakes, Michigan, Erie, Great Salt Lake** – USA
- **Assal** – Djibouti (World Saltiest Lake)
- **Kariba** – Zambia and Zimbabwe (Africa)
- **Great Bear, Great Slave, Reindeer, Winnipeg and Athabasca** – Canada
- **Lake Van** – Turkey (World 2nd Saltiest)
- **Victoria Lake** – Tanzania, Uganda and Kenya
- **Red Lagoon** – Bolivia
- **Five Flower Lake** – China
- **Volta** – Ghana, Africa

Important Valley of the World –

- **Hunter Valley** – New South Wales, Australia
- **Butterfly Valley, Happy Valley** – Hong Kong
- **Chitwan Valley** – Nepal
- **Panjshir Valley** – Afghanistan
- **Death Valley** – California, USA
- **Kangaroo Valley** – Australia
- **Rhine Valley** – Germany
- **Valley of the Kings** – Egypt
- **Swat Valley (Mini Switzerland), Hunza Valley** – Pakistan
- **San Juan Valley, Rabbit Valley** – USA

Types of Agriculture/ Farming in the world –

Jhum Agriculture – It's also known as Shifting Cultivation or Jhum Cultivation or Slash & Burn Agriculture

- Milpa- Mexico and Central America
- Ladang- Indonesia
- Roca- Brazil
- Rey- Vietnam
- Jhum- India (Assam)

Mixed Agriculture – Growing of Crops with Livestock Farming at same place.

Plantation Agriculture – A kind of commercial farming that focuses on a single crop such as Tea, Coffee, Sugarcane, Cashew, Rubber, Bananas, Cotton on very big land.

Important Agriculture related Institute Internationally –

- Food and Agriculture Organisation (FAO)- Rome (Italy)
- International Forest Research Institute (CIFOR)- Bogor (Indonesia)
- World Meteorological Organization (WMO)- Geneva (Switzerland)
- International Rice Research Institute (IRRI)- Manila (Philippines)

Major Transport of the World – A system in which passengers and goods are carried from one place to another.

- By water is cheapest way while by air is most expensive way of transportation.
- The world has been made smaller due to fast means of transport and rapid rate of globalization.
- Land, Water, and Air are the major modes of transportation
- Land/ Road Transport-Largest Road network in the world has- USA (1st), India (2nd), China (3rd), Brazil (4th)
- Longest road in the world is the Pan American Highway (48000 km/ 30000 miles), North- South America
- 2nd Longest- Highway-I Australia, 3rd longest- Trans-Siberian Highway, 4th Longest- Trans-Canada
- Rail Transport- World first railway track was built in 1835 in England
- World 1st train was started between Manchester to Liverpool (Both in England)
- World Longest railway track is Trans-Siberian Track (From Russia's Saint Petersburg, Leningrad to Vladivostok) is about 9289 km long.
- World 2nd Longest is- Trans-Canadian Railway (Between Montreal to Vancouver, Both in Canada)

Important Sea Port of the World –

- **Vancouver** – Canada
- **Cape Town** – South Africa
- **Lisbon** – Portugal
- **Auckland** – New Zealand
- **Chabahar** – Iran (Collaborate with India)
- **Santos (Coffee Port)** – Brazil
- **Kahira, Alexandria** – Egypt
- **Yokohama** – Japan
- **Hambantota** – Sri Lanka (Lease to China for 99 years)
- **Gwadar** – Pakistan (Collaborate with China)

Important Rivers of the World –

- Busiest river of the world is- Yangtze (China)
- Nile originated from Lake Victoria and outflow in Mediterranean Sea. It is longest river of the world (6650 km)
- Congo (Zaire) river cross equator Twice. It is also known as highway of Central Africa
- Yangtze Kiang originated from Tibet Plateau and outflow in China Sea. It is longest river of Asia (6300 km)
- Ob river (Russia) is known for Gas and Oil fields
- Hwang Ho (Yellow River) is known as Sorrow of China
- Irrawaddy flows in Myanmar. It is the lifeline of Myanmar
- Tigris and Euphrates (Iraq) are known for Mesopotamia (Sumerian) Civilization
- Volga river is longest river of Europe
- Thames is the longest river of England. London is located on this river bank.
- Amazon river (2nd Longest) originated from Andes Range (Peru) and outflow in Atlantic Ocean. It is largest river by volume
- Missouri is longest river of North America. Mississippi is 2nd Longest River of North America
- Mackenzie is longest River of Canada.



Important Peaks of the World –

- | | | |
|-------------------------------------|--|--------------------------------------|
| • Mt. Everest – Nepal/ China | • Mt K2 (Godwin Austin) – India/ Pakistan (POK) | • Kangchenjunga – Sikkim |
| • Lhotse – Nepal/ China | • Makalu – Nepal/ Tibet (China) | • Dhaulagiri – Nepal |
| • Manaslu – Nepal | • Nanga Parbat – Pakistan | • Annapurna – Nepal |
| • Mt. Kailash Parbat – China | • Mt. Rakaposhi – India/ Pakistan (POK) | • Mt. McKinley (Denali) – USA |
| • Mt. Aconcagua – Argentina | • Elbrus – European Russia | |

Important Straits of the World –

Strait: It is a thin channel of waterways connects two larger bodies of water.

Straits	Countries	Joining Sea's / Water Bodies
Malacca	Indonesia –Malaysia	Andaman Sea & South China Sea
Palk Strait	India-Sri Lanka	Gulf of Mannar & Bay of Bengal

Bab-al-Mandeb	Yemen-Djibouti	Red Sea & Gulf of Aden (Arabian Sea)
Bering Strait	Alaska (USA)-Russia	Bering Sea & Chukchi Sea
Hormuz	Oman-Iran	Gulf of Persia & Gulf of Oman
Gibraltar Strait	Spain-Morocco (Europe & Africa) - Mediterranean Sea & Atlantic Ocean	

Important Islands of the World –

Island: Land that is surrounded by water is called island or isle.

Isthmus: A narrow strip of land with sea on either side, forming a link between two larger areas of land.

Island	Country	Features
Greenland	Denmark	Largest in the world, Arctic & Atlantic Ocean
New Guinea	Australia	2 nd Largest, Largest in Southern Hem. Pacific Ocean
Borneo	Indonesia, Malesia & Brunei	3 rd Largest in the world
Madagascar	Autonomous Country	4 th Largest, world's second-largest island country
Honshu, Hokkaido, Kyushu and Shikoku-	All lies in Japan. Capital Tokyo is located on Honshu	
Majuli	India	World Largest River Island (Brahmaputra River)
Danger	Australia	Smallest Island of the World (76 Acres only)
Nauru	Oceania	Smallest Island Nation of the World (21 km ²)
Devon	Canada	World largest uninhabited Island

Important Waterfalls of the World –

Waterfall	Country	Features
Salto Angel	Venezuela, South America	World Highest, 979 m, Churun River
Tugela Falls	South Africa	World 2 nd Highest, Tugela River
Tres Hermanas Falls	Peru, S. America	World 3 rd Highest, Cutivireni River
Iguazu Falls	Argentina-Brazil	World Widest Waterfall
Niagara Falls	USA- Canada	-
Victoria Falls	Zimbabwe- Zambia	Zambezi R.
Brown waterfalls	New Zealand	

Important Canals of the World –

Canal	Country	Features
Suez Canal (1869)	Egypt	Connect Red Sea to Mediterranean Sea
Panama Canal (1914)	Panama	Connect Pacific Ocean to Atlantic Ocean
Kiel Canal	Germany	Connect North Sea to Baltic Sea
Grand Canal	China	Connect Yellow River and Yangtze River

Note: Busiest canal in the world is- Kiel Canal (Germany)

Longest and Oldest Canal in the world is The Grand Canal (China)- About 1800 km

World Biggest Shipping Canal is- Suez Canal (Egypt)

Important Dams of the World –

Dams	Country	Features
Three Gorges Dam	China	World Largest Dam, Yangtze River
Aswan Dam	Egypt	Nile River
Hoover Dam	USA	Colorado River
Kariba Dam	Zambia / Zimbabwe	Zambezi River
Grand Coulee Dam	USA	Colombia River

Important International Boundaries of the World –

Boundary	Country
McMahon Line	India and China (1914, Sir Henry McMahon), Shimla Convention
Radcliffe Line	India and Pakistan (1947, Sir Cyril Radcliffe), Bangladesh also
Durand Line	Pakistan and Afghanistan (1893)
Siegfried Line (Magenot Line)	France and Germany
17 th Parallel	North Vietnam and South Vietnam
24 th Parallel	India and Pakistan

31 st Parallel	Iran and Iraq
38 th Parallel	North Korea and South Korea
49 th Parallel (Medicine Line)	USA and Canada (World Longest, Approx 9000 km)
LAC- Line of Actual Control	India and China (1959 by Zhou Enlai, 1 st PM of China), 1962 War
LOC- Line of Control (Ceasefire Line)	India and Pakistan (July 1972, Shimla Convention) after 1971 War

Important Tribes of the World –

- **Eskimo (Inuit)**- Tundra Region (Alaska, Canada, Greenland and Siberia)- Mainly Hunters, eat Raw Flesh. Make Ice/ Snow Houses named “**IGLOO**”. Spear used by them is called Harpoon. boat made of leather is called Kayak (Bigger Umi yak). Cart without wheels called Sledge. Siberian Husky and Reindeer pull sledge.
- **Bushman**- Living in Kalahari Desert, Africa (South Africa, Zimbabwe, Namibia, Botswana etc.). Termite is known as Rice of Bushman's.

• **Bantu**- South Africa

• **Red Indian**- North America

• **Bedouin (Baddu)**- Arabian Desert (Saudi Arabia, Iran, Iraq, Syria etc.)

• **Khirghiz (Kyrgyz)**- Central Asia (Kyrgyzstan, Afghanistan, Kazakhstan, Uzbekistan, Tajikistan)

• **Pygmy**- Congo Basin (Central Africa)- Make houses and Huts on Tree named- Mongulus.

Top 10 Countries of the World (Area Wise) –

1– Russia	2– Canada	3– USA
4– China	5– Brazil	6– Australia
7–India (2.44%)	8– Argentina	9– Kazakhstan
10– Algeria		

Top 5 Countries of the World (Population Wise) –

1– India	2– China	3– USA
4– Indonesia	5– Pakistan	

Important Plateau's of the World – A plateau is a flat-topped table land with very sloppy edges.

- Tibetan Plateau – World Largest and Highest Plateau. Located between Kunlun and Himalaya's Karakoram Range) in Tibet, China Region (Central Asia).
- Pamir Plateau – Central-South Asia – Also known as Roof of the World
- Columbia – Snake Plateau- USA
- Katanga Plateau- Congo Republic, Africa
- Deccan Plateau- Southern India
- Colorado Plateau, Appalachian Plateau – USA
- Patagonian Plateau- Argentina

Important Peninsula of the World –

- A piece of land that is surrounded three side by water and connected one side to the mainland.
- Largest Peninsula of the world is – Arabian Peninsula (1,250,006 square miles). Yemen, Oman, Qatar, Bahrain, Kuwait, Saudi Arabia, UAE, and parts of Jordan and Iraq.
- Indian (Deccan/ Southern) Peninsula- Southern India (World 2nd largest). It is the oldest landmass of India.
- Indo-China Peninsula- World 3rd Largest (Myanmar, Cambodia, Laos, Malaysia, Thailand, and Vietnam)

Important Minerals of the World –

- Largest producer of minerals in world is China. 2nd largest is USA.
- China is the world's largest producer of coal, gold, antimony, magnesium, tin, zinc, manganese and tungsten.

Minerals	Country	Indian states	Minerals	Country	Indian states
• Gold	China	Karnataka	• Silver	Mexico	Rajasthan
• Diamond	Russia	Madhya Pradesh	• Coal	China	Jharkhand
• Petroleum	USA	Rajasthan	• Uranium	Kazakhstan	Andhra Pradesh
• Mica	China	Andhra Pradesh	• Tin	China	Haryana
• Copper	Chile	Madhya Pradesh	• Iron-ore	Australia	Odisha (reserved Karnataka)

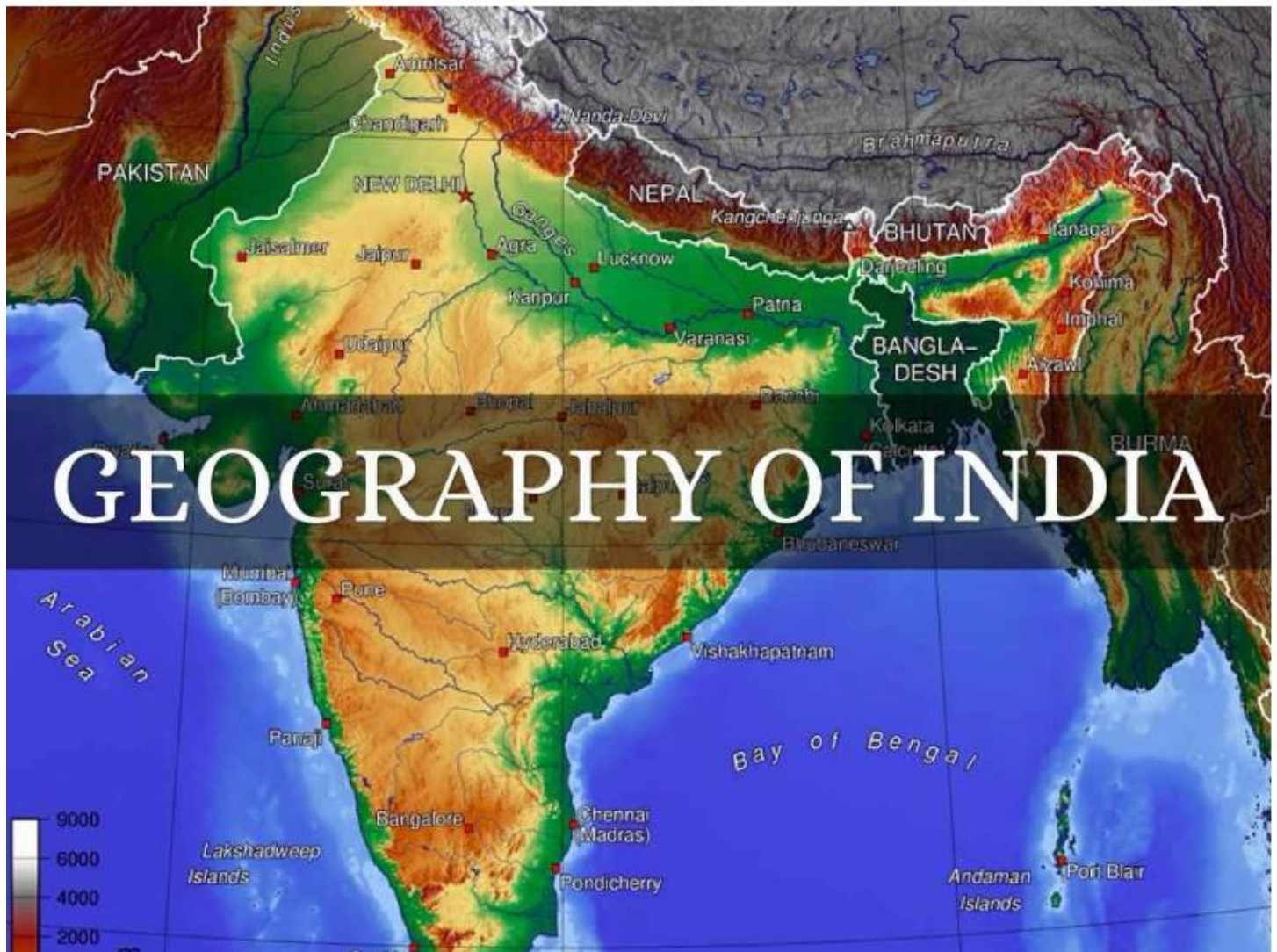
Different Habitats and Vegetations –

- **Lithophytes** – Plants that grow in or on hard rocks
- **Mesophytes** – plants that grow in moderate (Temperate) conditions (neither too wet nor too dry)
- **Hydrophytes** – Plants that live and grow in water
- **Halophytes** – Plants that is grown in saline water and saline environment

- **Xerophytes** – Plants that can survive in very dry environments (Tropical Desert plants)
- **Epiphytes** – Plants which grow perched on other plants (Supporting plants)
- **Cryophytes** – Plants which is grown extreme cold conditions (Tundra & Siberia Region)

Another Important Facts about Geography –

- The person who created the first map of the World is- Anaximander (Ancient Greek)
- Who show India on World Map first- Ptolemy (Egypt)
- Who designed the first map of Modern India- Captain James Renell (United Kingdom)
- Highest tides in the world occur in the Bay of Fundy, Canada
- Albedo is the portion of sun rays reflected from surface of the Earth to back into space
- Albedo is higher in Snow or Ice, 2nd Dense Clouds.
- Climate- statistical weather information of a particular place over a long period (Minimum 35 years)
- Climate of a place is affected by latitude, relief features (altitude), distance from sea and winds blowing in the region
- Weather- The condition of the atmosphere at a given place and time is called weather. Weather is day-to-day information on the atmospheric conditions in any area.



INDIAN GEOGRAPHY –

India Introduction –

- Latitudinal extent – 8°4' North to 37°6' North (Mainland, TN). 6°4' North to 37°6' North (Southern Most, Great Nicobar).
- Longitudinal extent - 68°7' East to 97°25' East
- India lies is completely Northern & Eastern Hemisphere (North from Equator and East from Prime Meridian)

- North-South Extent – 3214 km
- East-West extent – 2933 km
- Land Boundary (With neighbor countries) – 15200 km (Actual- 15106.7 km)
- Only mainland Coastline – 6100 km. Total Coastline – 7516.6 km (With Islands) (Longest – Gujarat)
- 9 states and 4 UTs is connected with sea and water bodies. India has States – 28, Union Territories (UTs) – 8, District – 806
- India has 5 Land Locked state– Haryana, Chhattisgarh, Telangana, Madhya Pradesh and Jharkhand
- Apart this 2 UTs also Land Locked – Delhi and Chandigarh
- Eastern Most Point of India – **Kibithu (Arunachal Pradesh), 97°25' East**
- Western Most Point of India – **Guhar Moti or Gor Mota (Kutch District, Gujarat), 68°7' East**
- Northern Most Point of India – **Indira Col (Ladakh), 37°6' North**
- Southern Most point (Mainland) – **Kanyakumari or Cape Comorin (Tamil Nadu), 8°4' North**
- Southern Most point (Overall) – **Indira Point or Pygmalion Point or Parsons Point (Great Nicobar), 6°4' North**

Area of India –

- Total area of India – 3287263 square km or 3.28 million square km.
- 32.87 Lakh sq. km (2.44% of the World) – 7th largest after Russia, Canada, USA, China, Brazil and Australia
- Population – According to 2011 census– 121 crore (17.44% of the World)
- Population – Current scenario– 142 crore (Largest in the World)
- Top 3 Largest State (Area wise)- **1st Rajasthan, 2nd MP, 3rd Maharashtra,**
- Last 3 Smallest State (Area wise)- **26th Tripura, 27th Sikkim, 28th Goa**
- Top 3 States (Population wise)- **1st UP, 2nd Maharashtra, 3rd Bihar,**
- Last 3 States (Population Wise)- **26th Arunachal Pradesh, 27th Mizoram, 28th Sikkim**
- All UT's of India (Area Wise)- **Ladakh (Largest), Jammu & Kashmir, Andaman and Nicobar Islands, New Delhi, Dadra & Nagar Haveli and Daman & Diu, Puducherry, Chandigarh, Lakshadweep (Smallest)**
- All UT's of India (Population Wise)- **New Delhi (Largest), Puducherry, Chandigarh, Dadra & Nagar Haveli and Daman & Diu, Andaman and Nicobar Islands, Ladakh, Lakshadweep (Smallest)**
- Gulf of Khambhat is lies between Daman and Diu.
- Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland and Tripura are **Seven Sisters State.**
- State shares its boundary with maximum states– Uttar Pradesh, 8 states and 1 UT (Delhi)
- Puducherry is the only UT is in 3 States - Mahe (Keralam), Karaikal and Puducherry (Tamil Nadu), Yanam (Andhra Pradesh)

Indian Standard Meridian Time (IST) –

- Indian Standard Time (IST) is taken from Naini, Near Mirzapur, Prayag Raj (Allahabad), 82°5' East Longitude.
- IST = + 5:30 hrs. from Greenwich Mean Time (GMT). Sri Lanka and India have same time zone.
- Indian IST line is cross Five states i.e., UP, MP, Chhattisgarh, Odisha and Andhra Pradesh
- Time difference between Gujarat and Arunachal Pradesh (Eastern Most and Western Most) is 2 Hours.

Tropic of Cancer –

- Passes through middle of India (23.5° North) and divided India almost two equal parts.
- Capital on Tropic of Cancer – Ranchi (Jharkhand)
- Tropic of Cancer passes through 8 states – Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram (west to east)
- Tropic of Cancer and IST cross each other at Koriya District, Chhattisgarh

Neighbours Country of India with Covering Borders and states –

- Boundaries of India – Himalaya Mountain, Afghanistan, Nepal, Bhutan and China in North; Sri Lanka and Indian Ocean in South; Bangladesh, Myanmar and Bay of Bengal in East; Pakistan and Arabian Sea in West.
- Land Neighbours – 7- Bangladesh, China, Pakistan, Nepal, Myanmar, Bhutan and Afghanistan
- Longest Boundary – Bangladesh (4096.7 km), Shortest Boundary – Afghanistan (106 km, Ladakh (POK)
- Water Neighbours – 2- Sri Lanka on South-East, Separated by Gulf of Mannar and Palk Strait
- Maldives on South-West, Below Lakshadweep Island.
- Adam Bridge is between Sri Lanka and India. Pamban Island (Rameswaram) and Dhanush Kodi are part of it.
- McMahon Line (1914) between India and China by Sir Henry McMahon.
- Radcliffe Line (17 August 1947) between India and Pakistan by Sir Cyril Redcliffe
- Durand Line (1893) between Pakistan and Afghanistan by Sir Mortimer Durand

- Teen Bigha Corridor between India and Bangladesh. Naga Hills between India and Myanmar
- Wagah Border, Ataari Border (Both in Amritsar, Punjab) and Longewala Borders (Jaisalmer, Thar Desert, Rajasthan) are between India and Pakistan.
- Line of Control (LoC) is between India and Pakistan. Line of Actual Control (LAC) is between India and China
- The only Indian state having three side borders (covered) by Bangladesh – Tripura
- India, Bhutan, Maldives, Sri Lanka, Nepal, Bangladesh and Pakistan are the part of Indian Subcontinent.
- Sir Creek Dispute is between India (Rann of Kutch, Gujarat) and Pakistan

Physical Division of India –

India divided into Six Physical divisions – The Himalayas, The Great Indian Plains, Peninsular or Deccan Plateau, Coastal Plains, Indian Desert and The Islands.

The Himalayas – Himalaya is New (Young) folded mountain.

- Himalayas is a series of High Mountains Ranges stretching over the Northern Border of India.
- Mountains arranged in a line is known as Ranges.
- The Himalayas, separating the Indian subcontinent from Asia continent
- The highest mountain range of the World, located between Ladakh and North-Eastern states.
- Length – about 2400 km; Width – 400 km in Kashmir and 150 km in Arunachal Pradesh.
- Trans Himalaya or Tibet Himalaya – Mt K2, Mt. Kailash, Jaskar, Karakoram, Ladakh lies in this range.
- World most sloppy peak Rakaposhi is lies in Trans Himalaya.
- Siachen, Baltoro, Biafo and Hispar Glacier also lies in Trans Himalaya.
- The greater Himalaya, Inner Himalaya or Himadri – Mt Everest, Kanchenjunga, Makalu, Dhaulagiri, Nanga Parbat, Nanda Devi, Kedar Nath and Annapurna lies in this range. Ganga and Yamuna also originated in this range.
- The lesser or Middle Himalaya is called Himachal Himalaya – Kashmir Valley, Lahaul-Spiti, Kullu, Mahabharata, Mussoorie and Kangra valley lies in middle Himalaya.
- The outer Himalaya or lower part is known as Shivalik. Newest Folded Mountain range of the world.
- Himalaya range from north to south- Karakoram > Ladakh > Jaskar > Pir Panjal > Dhauladhar > Mussoorie > Shivalik

Major Himalayan Peaks in India –

- World highest mountain peak is Mount Everest (8848.86 meter), is lies in Nepal and Tibet (China).
- In Nepal Mt. Everest is known as Sagarmatha and in China it is known as Chomolungma.
- Mt Everest gets its English name from Sir George Everest.
- Godwin Austin or Mt. K2 – (8611 m) – Located in PoK – World 2nd Highest and Highest Peak of India
- Kanchenjunga (8598 m) – Sikkim – World 3rd Highest peak
- Nanda Devi (7816 m) – Located in Uttarakhand
- Highest peak of North-East – Mt Saramati, 3826 m (Nagaland) bordered with Myanmar.
- Nanga Parbat (8126 m) – Located in Jammu & Kashmir
- Kamet – (7756 m) – Located in Uttarakhand

The Great Plains –

- The Indus (Sindhu), Ganga and Brahmaputra plains comprise one of the most fertile lands in world.
- The length of Great Plains is about 3200 km and width is about 150 to 300 km.
- The plain contains Alluvial Soil which is taken by the river and deposit it on plains.
- Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal etc. are part of the Indian plains

Peninsular India or Deccan Plateau –

- Deccan plateau is bordered by the Western Ghats in the West, Eastern Ghats in the East and the Satpura, Maikal and Mahadeo hills in North
- The area between Arabian sea and Bay of Bengal and south of Vindhya comprise the great Deccan plateau.
- Deccan plateau is the largest plateau in India. It is made up of Lava flows and deposits.

Western Ghats (Paschmi Ghat) –

- Also known as Sahyadri. Western Ghats are Block Mountains. Total length of Western Ghats- 1600 km
- Situated between Gujarat to Keralam, parallel to the western coast of India and Arabian Sea.
- Anaimudi (Everest of South India), 2695 m, (Keralam) is the highest peak of South India and Western Ghats.
- Gadgil (2011) and Kasturi Rangan Committee (2013) related with Western Ghats.

Passes in Western Ghats –

- Thal Ghat (Kasara Ghat) – Connects Mumbai to Nashik (both lies in Maharashtra)

- Bhor Ghat– Connects Mumbai to Pune (both lies in Maharashtra)
- Pal Ghat (Palakkad Gap) – Connects Coimbatore (Tamil Nadu) to Palakkad (Keralam)
- Amboli Ghat Pass– Connects Maharashtra to Belgaum (Karnataka)
- Shencottah Gap– Connects Madurai (Tamil Nadu) to Kottayam (Keralam)

Eastern Ghats (Purvi Ghat) –

- Situated between Odisha and Tamil Nadu parallel to Bay of Bengal in Eastern Side of Peninsular India.
- Jindhagada Peak, 1690 m (Andhra Pradesh) is the highest peak of Eastern Ghat (Earlier was Mahaendragiri)
- Western Ghats and Eastern Ghats are meet at Nilgiris Hills.
- Nilgiri Hills lies in the boundary of Keralam, Karnataka and Tamil Nadu.
- Highest Peak of Nilgiri is Doda Betta, 2637 m (Tamil Nadu).
- Nilgiri Hills (Blue Mountain) got its name due to Violet Blossoms of 'Kurinji' or 'Neelakurinji' flower.

Other important ranges and mountains of India –

Aravalli – Oldest Folded (Tectonic) Mountain Range of the World. It is situated on North Western part of India.

- Aravalli is a residual mountain. It lies from Palanpur (Gujarat) to Raisina Hills (New Delhi)
- Aravalli is located in 4 state and UTs – Gujarat, Rajasthan, Haryana and New Delhi
- Total length of Aravalli is about 692 km. Highest peak – Guru Shikhar, 1722 m, near Mount Abu, Rajasthan
- Dilwara Jain Temple located in Mount Abu and Mount Abu is part of Aravalli Hills
- Rivers Banas, Luni, Sabarmati are born in Aravalli's. Banas is a tributary of Chambal. Luni is seasonal river that terminates in the Rann of Kutch. Apart this Sambhar Lake, Lake Dhebar lies in Aravalli.

Vindhya Mountain Range – Located in central India, divide India into North India and South India.

- Length about 1200 km from Gujarat to Bihar
- Sad-Bhawna Shikhar or Goodwill Peak 752 m, (Madhya Pradesh) is the highest peak of Vindhya Range

Satpura Mountain Range – Series of seven mountains (Seven Folds), Length about 900 km.

- Satpura Range lies in Gujarat, Maharashtra, Madhya Pradesh and Chhattisgarh
- Dhupgarh (1350 m) in Madhya Pradesh is the highest peak of Satpura.

Note: Narmada and Tapti (Tapi) river flow through Vindhya and Satpura Range.

- **Rajmahal Hills, Dalma Hills** – located in Jharkhand
- **Garro, Khasi, Jaintia** – lies in Meghalaya, Shillong and world rainiest place Mawsynram is located in Khasi Hills
- **Mikir Hills, Rengma Hills** – Located in Assam, South of Kaziranga National Park.
- **Dafla, Miri, Abor, Mishmi, Patkai Boom** – located in Arunachal Pradesh
- **Mizo and Lushai Hills** – Mizoram
- **Girnar or Gir Hills** – located in Gujarat, famous for Gir National Park (Asiatic Lions)
- **Baba Budan Giri Hills and Chikkamangaluru Hills** – Located in Karnataka, famous for Coffee plantation.
- **Annamalai, Javedi, Shevaroy, Palani Hills** – located in Tamil Nadu
- **Cardamom Hills (Elaichi Hills)** – located in Tamil Nadu, Southern Most Hill of India.
- **Seshachalam, Palkonda, Velikonda Hills** – Located in Andhra Pradesh

The Coastal Plains –

Western Coast – Area between Arabian Sea and Western Ghats. Lies from Gulf of Khambhat (Gujarat) to Cape Comorin, Kanyakumari (Tamil Nadu). It is 10 to 25 km wide.

- **Kutch and Kathiyawad Coast** – Lies in entire Gujarat.
- **Konkan Coast** – Area between Maharashtra and Goa.
- **Kannada Coast** – Area between Goa to Mangalore (Karnataka)
- **Malabar Coast** – From Mangalore to Kanyakumari. Malabar coast mainly in Keralam, Monsoon is first appear here.
- India's Longest Vembanad Lake lies in Keralam near Malabar Coast.

Eastern Coast – The area between Bay of Bengal and Eastern Ghats, from Kanyakumari (TN) to West Bengal

- Eastern Coast is more fertile due to Mahanadi, Godavari, Krishna and Cauvery delta.
- **Utkal Coast** – Area between West Bengal to Odisha. Chilka lake (Largest Lake of India) is lies here.
- **The North Circar (Uttari Sarkar) Coast** – Area between Odisha to Andhra P. Sri Harikota and Pulicat Lake is here.
- **Coromandel Coast** – From Andhra Pradesh. to Kanyakumari (TN)

The Indian desert –

- The Great Indian Desert (also called Thar Desert) lies in North-West of Aravalli Hills.
- In Deserts the difference between day and night temperatures are highest (day= 45+°C and night below 0°C)
- Thar Desert is spread over four states in India- Punjab, Haryana, Rajasthan and Gujarat, Area- 240000 km²
- It lies mainly in India (About 85%) and rest in Pakistan (About 15%)
- Thar Desert is hottest desert and Ladakh is coldest desert in India.
- Jaisalmer (Rajasthan) is called the desert city of India. In Rajasthan Thar Desert is known as Bagar of Bagad.
- Lake Sambhar – Most Saline water lake of India lies in Thar Desert. Pokhran lies near Jaisalmer.
- River Luni is also flow in Thar Desert region.
- Thar region produces herbaceous plants like cactus, neem, khejri, Acacia Nilotica etc.

The Islands and Island Group of India –

The Andaman and Nicobar – Located in Bay of Bengal. Total 836 Islands. (Inhabited Islands-31)

- Total Area – 8249 Sq. Km
- Capital Port Blair and Cellular Jail (Prison) is located in South Andaman
- Highest peak of Andaman – Saddle Peak, Lies in North Andaman (Approx. 738 m)
- Highest peak of Nicobar – Mount Thullier, Lies in Great Nicobar (Approx. 642 m)
- India's only active Volcano Barren is found in Middle Andaman. Narcondam is a dormant volcano also lies here
- Southernmost Point of India –Indira Point lies in Great Nicobar.
- Jarawa's, Onges, Shompen's and Sentinelese main tribe of Andaman and Nicobar Islands.
- Official Language – Hindi, English & Bengali. State Animal – Dugong (Sea Cow)

Lakshadweep – Located in Arabian sea (very near to Keralam State). Total 36 Islands (Inhabited Islands – only 10)

- Total Area- Only 32.69 Sq. Km. By area India's smallest Union Territory is Lakshadweep.
- Lakshadweep is a Coral Island. Andrott Island is the largest island of Lakshadweep
- Minicoy Island is the southern-most island and 2nd largest island of Lakshadweep.
- Amini, Kadmat, Kalpeni is another important island in Lakshadweep.

Sri Hari Kota – Located near Andhra Pradesh. Satish Dhawan Space Centre (SDSC) and Pulicat Lake is located here

Pamban Island – Located between India and Sri Lanka, Rameswaram and Adam Bridge (Ram Setu) situated here

New Moore Island – Located between India and Bangladesh. It is a disputed island.

Coco Island – Located in Bay of Bengal. Disputed island between India and Myanmar.

Majuli Island – Located in Assam in center of Brahmaputra River. World largest river island.

Aliyabet and Khadiyabet Island – Located in Gujarat, on the bank of Narmada and Tapti River respectively.

Willingdon Island – Located in Kochi, Keralam. Largest man-made island of India.

Famous Channels –

- Great Channel separate Andaman's Indira Point and Indonesia
- 10° Channel separate Mini Andaman Island and Car Nicobar Island
- 9° Channel separate Minicoy and Lakshadweep
- 8° Channel separate Minicoy and Maldives
- 7° Channel separate Amini dive from Lakshadweep
- 6° Channel or 6° Latitude separate Great Nicobar and Sumatra Island (Indonesia)

Climate of India – Indian climate is Tropical Monsoon type.

- Monsoon starts in June from Keralam State. About 75% of Indian rain is occur due to South-West Mansoon
- End of the Monsoon is known as Retreating of Monsoon, occurred in October and November month.
- Tamil Nadu got its rainfall due to North-East Mansoon or Retreating of Monsoon from Bay of Bengal water.
- Western Disturbance – Winter Rain, Rise in Mediterranean Sea. This rain is very helpful for Rabi Crops in India.
- There are 4 Seasons (Ritu's) in Indian Climate System-

- Summer Season- March to June

Monsoon Season- June to September

- Autumn Season- September to November

Winter Season- December to February

River system of India –

- The rivers which flow before Himalaya's is known as Antecedent Rivers. Ex.- Indus, Ganga, Sutlej, Brahmaputra etc.
- Drainage system of Indian Rivers has two types – Himalayan River and Peninsular River
- Punjab is the land of five rivers – Sutlej, Beas, Ravi, Chenab and Jhelum.

- Ground Water is the major source of fresh water in India.
- The groundwater table is known as the water table. When a drought hits a region, it affects the water level below ground. The consequence of this is lowering of groundwater level because of continuous evaporation and flow.

The Indus (Sindhu) River System –

- Indus originates from Bokhar Chu Glacier near Mansarovar Lake in Kailash Mountain Range, Tibet (China). In Tibet the origination place of Indus is known as Singhi Khamban which means Lion's Mouth.
- Indus flows in Tibet (China), Afghanistan, India and Pakistan. Indus fall into Arabian Sea in Pakistan.
- Indus total length is 2880 km and it flows in India 1114 km.
- State/ UT where Indus flow in India – Ladakh only. Leh is situated on the left bank of Indus.
- Sutlej, Beas, Ravi, Chenab and Jhelum are the major tributary of Indus.
- Indus Water Treaty was a water-distribution treaty between India-Pakistan in 1960. This treaty was signed between India's PM Jawahar Lal Nehru and Pakistan President Ayub Khan at Karachi (Pakistan).

Sutlej River – Originate from Rakastal near Mansarovar Lake in Tibet. Enter India from Shipki La pass of Himachal Pradesh.

- Bhakra Nangal Dam is built on Sutlej River.
- Total length of Sutlej River is 1450 km and it flows in India about 1050 km.
- At Mithankot (Pakistan) Sutlej merge with Indus.

Beas River (470 km) – Originate from Beas Kund, near Rohtang Pass in Himachal Pradesh.

- It is flow in Kullu Valley of Himachal Pradesh.
- Merge in Sutlej at Harike (Punjab) and built the Harike Barrage. India's longest canal Indira Gandhi Canal (640 km) is originated from Harike in Punjab.

Ravi River (720 km) – Originate near Rohtang Pass of HP.

- It is flow in Chamba Valley of Himachal Pradesh
- Merge with Chenab River at Pakistan.

Chenab River (960 km) – Originate near Lahaul Spiti, Bara Lacha La Pass of Himachal Pradesh

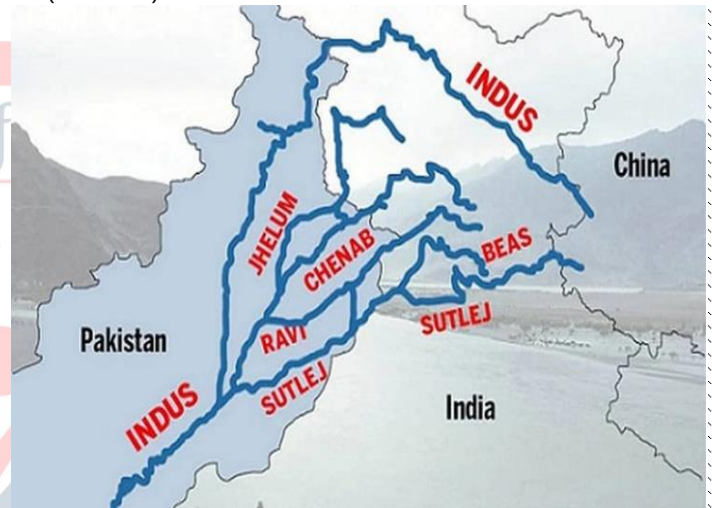
- Kishtwar Project, Rattle Project, Salal Project and Dulhasti Project (All hydroelectricity) is related with Chenab River.
- Highest Railway Bridge of World – Chenab River (1315 m long and 359 m high from sea level) at Reasi Distt. of J&K
- Chenab River merge with Sutlej at Pakistan.

Jhelum River (725 km)–Originate from Verinag (Shesh Nag Lake), J&K

- Flowing through Wular Lake, J&K (Largest freshwater lake of India). Sri Nagar is lies on bank of Jhelum River.
- Jhelum River join Chenab River near Jhang Province of Pakistan

The Ganga River System (Largest River System of India) –

- Alaknanda is originated from Satopanth Glacier and Bhagirathi is originated from Gangotri Glacier (Gomukh).
- At Dev Prayag Alaknanda and Bhagirathi confluence (meet) and form Ganga River.
- Ganga is the longest river of India – 2525 km
- Badri Nath temple (Uttarakhand) is situated on the bank of Alaknanda River.
- Tehri dam, Uttarakhand (India's Highest Dam 260.5 m) is situated on Bhagirathi River.
- Ganga is flowing in 5 states of India – UK, UP, Bihar, Jharkhand and West Bengal
- In West Bengal a distributary of Ganga separate from it, is known as Hugli River. Kolkata is situated on Hugli River bank.
- After West Bengal Ganga (Bhagirathi) entered in Bangladesh and known as Padma.
- In Bangladesh Ganga is known as Padma.
- At last Ganga falls into Bay of Bengal with Brahmaputra and make world largest Delta.
- This delta is known as Ganga-Brahmaputra Delta or Sundarbans Delta (Due to Sundari Tree)
- Ganga become National River in 2008.
- Tributary of Ganga – Ramganga, Gomti, Ghaghara, Gandak, Kosi (all from left side), Yamuna, Son, Tons (all from right side)
- **Kosi** is known as **Sorrow of Bihar** and **Damodar** (tributary of Hugli) is known as **Sorrow of Bengal**.



- Yamuna is the longest tributary of Ganga. It is originated from Bandar Poonch peak, Yamunotri Glacier, Uttarakhand.
- Yamuna length is about – 1376 km. Yamuna and Ganga both originated from Uttarkashi District of Uttarakhand.
- Yamuna joins Ganga at Prayag Raj (Allahabad). Chambal, Sindh, Betwa, Ken is major tributary of Yamuna.
- Chambal is longest tributary of Yamuna. It is famous for Gharial (Crocodiles).
- Chambal Rivers flows in Madhya Pradesh, Rajasthan, Uttar Pradesh but not in Gujarat.

The Brahmaputra River System –

- Originate from Mansarovar lake, Chemayungdung Glacier in Kailash Mountain Range, Tibet (China)
- Brahmaputra is known as Yarlung Tsangpo in Tibet, Dihang (Siyang) in Arunachal Pradesh, Brahmaputra in Assam and Jamuna in Bangladesh. It is entering India near Namcha Barwa in Arunachal Pradesh.
- World largest River Island is on Brahmaputra River – Majuli (352 km²) in Assam.
- Tributary of Brahmaputra – Subansiri, Manas, Kameng, Teesta (all from right side), Dihang, Dibang, Lohit, Dhansiri, Meghna (all from left side). Barak river is tributary of Meghna. Lohit River is also known as River of Blood or Khooni River.
- When Brahmaputra enter in Bangladesh, it merges with Ganga and world largest delta- Sundarbans delta.
- Brahmaputra fall into Bay of Bengal with Ganga.

The Peninsular River System or Rivers of South India –

Godavari (1465 km) – Largest and Longest River of South (Peninsular) India.

- Originates from Trimbakeshwar (Thriambak), Nashik Distt of Maharashtra.
- Also known as Ganga of South (Dakshin ki Ganga), Old Ganga or Vridha Ganga.
- Poorna, Vardha, Manjira, Painganga, Vein Ganga, Pranhita and Indravati are major tributary of Godavari

Krishna (1401 km) is the second largest river of South India. It is originated from Mahabaleshwar (Maharashtra) in Western Ghats. Tungabhadra, Koyna, Ghat Prabha, Mal Prabha, Musi, Bheema are major tributary of Krishna.

- At last Krishna merges with Godavari in Andhra Pradesh and make south India largest delta and fall into Bay of Bengal.

Mahanadi (851 km) – Originates from Sihava, Chhattisgarh. It falls in Bay of Bengal near Paradip (Odisha).

- Mahanadi is known as the life line of Odisha. Jonk, Tel and Ong are major tributary of Mahanadi.
- World longest Hirakud Dam is on Mahanadi River.

Cauvery (Kaveri, 800 km) – Also known as Ganga of South India or Dakshin Bharat ki Ganga.

- Originates from Brahmagiri Hills of Kodagu District, Karnataka.
- Kaveri is almost a Perennial River means all time water availability throughout the year.
- Shivanasamudra Falls (Karnataka) is on Cauvery River.
- Hemavati, Shimsha, Amravati, Arkavati are major tributary of Kaveri River. Kaveri falls in Bay of Bengal near Tamil Nadu.
- Godavari, Krishna, Mahanadi and Kaveri are all East Flowing Rivers make delta and fall into Bay of Bengal.

Narmada (1312 km) – Originates from Amarkantak, MP. Narmada is flowing between Vindhyan and Satpura.

- Narmada fall into Gulf of Khambhat in Arabian Sea. Sardar Sarovar Dam and Statue of Unity is on Narmada River.
- Narmada is the longest river which do not form Delta.

Tapi / Tapti (724 km) – Originate from Multai (Satpura Hills), Betul District of Madhya Pradesh

- Tapi fall into Gulf of Khambhat in Arabian Sea.
- Narmada and Tapi are West Flowing Rivers and do not form Delta. They make / form Estuary.
- Narmada and Tapi flow through rift valley.

Luni, Salt River (724 km) – Originate from Naag hills of Aravalli Ranges near Pushkar valley in Ajmer District, Rajasthan

- Luni River is also known as Ganga of Desert.
- Luni River flows in desert of Rajasthan and discharges its water in Rann of Kachchh in the state of Gujarat.

Other Facts about Rivers of India –

- Teesta river (tributary of Brahmaputra) dispute is between India and Bangladesh.
- Kosi is originated from Nepal with merging of Seven rivers. The main river is Arun that is originate from Tibet.
- Like Narmada and Tapi, Damodar is also flowing in Rift Valley.
- Dhuandhar waterfalls in Bheda Ghat near Jabal Pur, (Madhya Pradesh) is on Narmada River.
- Sabarmati River is originated from Aravalli Hills near Udaipur, Rajasthan and fall into Gulf of Khambhat, Arabian Sea.
- Ahmedabad (Gujarat) is lies on Sabarmati River bank.
- Mahi River is originated from MP. Its cross Tropic of Cancer twice.
- Mandovi and Zuari are the two main rivers in Goa. Doodh Sagar dam is on Mondovi River.

- Sharavati River is originate from Western Ghats in Karnataka. Jog falls is lies on it at Karnataka.
- Jamshed Pur (Jharkhand) is lies on Swarn Rekha River.

Major River Project in India –

- Pt. Jawahar Lal Nehru called the Dams and Multipurpose Projects as Temples of Modern India.
- India's first river project was – Damodar Valley Project (1948). It is based on USA Tennessee River Valley Project.
- Afghanistan-India Friendship Dam (old name- Salma Dam) is in Afghanistan.
- Sutlej-Yamuna Link (SYL) water dispute is between Haryana and Punjab.

Bhakra Nangal Project– Sutlej River	Hirakud Dam Project– Mahanadi, Odisha
Tehri –Bhagirathi River, Uttarakhand	Nagarjuna Sagar– Krishna River, Andhra Pradesh
Ukai Project –Tapti/ Tapi River, Gujarat	Idukki – Periyar River, Kerala
Farakka –Ganga, West Bengal	Indira Gandhi Canal Project –Sutlej + Beas
Sardar Sarovar Dam– Narmada, Gujarat	Salal, Dulhasti, Baglihar– Chenab
Uri – Jhelum	Gobind Vallabh Pant Dam (Rihand) – Rihand River, UP
Gandhi Sagar Dam – Chambal River, MP	Hussain Sagar Dam – Musi River, Hyderabad, Telangana
Hathni Kund (Tajewala Dam) Barrage – Yamuna River (HR)	Nizam Sagar Dam – Manjira River, Andhra Pradesh

Major Waterfalls in India –

- Ranchi, the capital city of Jharkhand is known as the city of waterfalls in India
- The Western Ghats are known as the Cherrapunji of South India
- Chitrakote Waterfall (Chhattisgarh) is known as Niagara of India

Kunchikal – Varahi, Karnataka- Highest waterfall of India	Dudhsagar (Sea of Milk) – Mandovi River, Goa
Nohkalikai Falls – Meghalaya- Highest plunge dam of India	Duduma – Odisha
Jog/ Gersoppa/ Mahatma Gandhi – Sharavati, Karnataka	Sivasamudram – Cauvery, Karnataka
Dhuandhar, Dughdhara, Kapildhara – Narmada, MP	Chuliya – Chambal (Rajasthan)
Hundru – Swarn Rekha, Jharkhand	Barehipani – Budhabalanga, Odisha

Famous Riverside Cities in India –

- Haridwar, Varanasi, Kanpur, Kannauj, Balia, Saharan Pur, Patna, Buxar, Bhagal Pur, Munger lies on Ganga Bank.
- Agra, Mathura, New Delhi lies on Yamuna River Bank.
- Kumbh Mela (Fair) comes every 12 Years, is lies on 4 Rivers named Haridwar (Ganga), Ujjain (Kshipra), Nasik (Godavari) and Prayag Raj (Ganga, Yamuna and Sarasvati Sangam).

Cuttack – Mahanadi	Nasik, Nanded – Godavari	Lucknow – Gomti
Ganga + Yamuna + Sarasvati – Prayagraj	Dibrugarh, Majuli, Dhubri – Brahmaputra	Tiruchirappalli, Tanjore, Mysore, Seringapatam – Kaveri
Jabalpur – Narmada	Surat, Betul –Tapti or Tapi	Ayodhya (UP) – Saryu
Ahmedabad, Gandhi Nagar – Sabarmati	Rourkela (Odisha) – Brahmani	Vijayawada (Andhra Pradesh) – Krishna
Gorakh Pur – Rapti	Gwalior, Kota – Chambal	Ghaziabad – Hindon
Ujjain – Kshipra	Sanchi, Vidisha – Betwa	Panji – Mandovi
Kolkata – Hugli	Ludhiana – Sutlej	Hyderabad – Musi
Badri Nath – Alaknanda	Bangalore – Vrishabhavathi	Coimbatore – Noyyal
Gaya – Falgu (Niranjana)	Chennai – Cooum, Adyar	Madurai (TN) – Vaigai
Sri Nagar – Jhelum	Rajkot (Gujarat) – Aji	

Famous Canals (Nehar) irrigations in India –

- Indira Gandhi Canal (Rajasthan Canal) – Longest canal of India, made by Govind Vallabh Pant. This canal is originated from Harike Barrage (Punjab).
- Western Yamuna Canal – Made by Firoz Shah Tughlaq. Originated from Tajewala (Haryana), Yamuna River.
- Sirhind Canal – Originated from Ropar (Punjab), Sutlej River.
- Bhakra or Bhakda Canal – Sutlej River, Punjab.

Agriculture System in India –

- India is an agricultural country. About 55% population of India indulge with agriculture.
- Indian agriculture is also known as Gamble of Monsoon.

- Agriculture cannot be practiced on mountains on a large scale because there has unsuitable climate.
- Aeroponics – When plants are grown in Air, without use of Soil (soil less farming).
- Aquaponics – When Fish, Snails, Prawns grow in tanks for income purpose and plants grown nearby the tanks.
- Jute is known as Golden Fibre. Red Chili is known as Wonder Spice.
- First agriculture university of India – Gobind Ballabh Pant University (1960), Pant Nagar (Uttarakhand).

Agriculture Methods –

- **Subsistence Farming (Intensive Farming)** – Farmers grow crops to meet the needs of themselves and their families on smallholdings. Worlds about 50% population is based on this type of farming.
- **Shifting Cultivation (Primitive Farming)** – Oldest method of Agriculture in India. In shifting cultivation, a forest area is burned and cleared for planting. Ash provides some manure. After some years of cultivation, fertility reduces, and weeds increase. The area is then left fallow and it repeat to secondary forest and Place. This agriculture is also known as Slash and Burn farming or Jhum Cultivation. It is mainly practice in Assam and Seven Sisters state.
- **Extensive Farming** – Mainly practiced in Developed Countries, like USA, Canada etc.
- **Commercial Farming (Mixed Farming)** – When agriculture and livestock (Pashupalan) practiced together.
- **Plantation Farming** – When a single crop is practiced on very large ground for profit. Ex.- Tea, Coffee, Rubber, Sugarcane, Banana, Cardamom, Cashew, Cocoa, Coconut etc.
- **Organic Farming** – When farming is done without use of chemical fertilizers and pesticides.
- Composting (Converting plant and animal waste into manure) is used in organic farming.
- Apart this, Vermi composting (process of breaking down the organic material with the help of earthworms) is also used.
- Father of Organic Farming in world is Sir Albert Howard (Britain) and Shri Subhash Palekar in India
- Sikkim is first organic state of India and world.

Crop Seasons in India –

- **1. Rabi** – Sown in October – November (Winter) and Harvest in April – May (Summer). Example: Potato, Rai (Black Mustard), Barley, Mustard, Gram, Wheat, Peas, Masoor Dal (Red Lentil), Barseem (fodder crop for animals)
- **2. Kharif** – Sown in June – July (Summer / Rainy) and Harvest in September – October (Winter). Example: Rice, jowar, bajra, ragi, maize, jute, cotton etc.
- **3. Zaid or Zayed (Sown and Harvest in Summer)** - Between March and June.
Watermelon, Cucumber, Pumpkin, Muskmelon, Kakdi, Bottle Gourd, Bitter Melon or Curry (Karela) and seasonal vegetables.
Trick to remember Zaid Crops– All Litter, Beldar or Bel wale (Vine Plants), Creepers, Climber crops.

Major Crops and Producing states and Countries –

Crops	Country	Indian States	Crops	Country	Indian States
Wheat	China	Uttar Pradesh	Rice	China	West Bengal
Tea	China	Assam	Coffee	Brazil	Karnataka
Sugarcane	India	Uttar Pradesh	Jute	India	West Bengal
Rubber	Thailand	Keralam	Potato	China	Uttar Pradesh
Pulses	India	Madhya Pradesh	Milk	India	Uttar Pradesh
Cotton	China	Gujarat and MH	Cocoa	Ivory Coast	Andhra Pradesh
Barley	Russia	Rajasthan			

- Andhra Pradesh is known as the Rice Bowl of India. Thailand and Vietnam are called Rice Bowl of the World.

Other revolutions in Agriculture in India –

- Round Revolution – Potato
- Yellow Revolution - Oil seed
- Blue revolution – Fish
- Silver Revolution – Eggs/ Poultry/ Hen Production
- Pink Revolution – Onion Production / Prawn Production / Pharmaceuticals Production
- Red Revolution – Meat Production / Tomato Production
- White Revolution (Operation Flood) – Milk Production
- Silver Fibre Revolution (White Gold) – Cotton Production
- Brown Revolution – Leather Production / Cocoa Production
- **Note** – Cotton, Brinjal, Soyabean and Mustard are only GM (Genetically Modified) crops in India
- Green Revolution – Food Grains
- Grey Revolution – Fertilizers
- Golden Revolution – Horticulture / Honey Production
- Black Revolution – Petroleum

Green revolution –

- It started in 1960s and related to increase in production of Wheat and Rice with High Yielding Variety Seeds.
- Father of Green Revolution in India – **MS Swaminathan (Tamil Nadu)**.
- Father of Green Revolution in World – **Norman Borlaug (won Noble Prize in 1970)**

White Revolution or Operation Flood –

- Related to Milk Production. It started in India in 13 January 1970.
- Father of White Revolution – Dr. Verghese Kurien
- Dr. Verghese Kurien founded AMUL (Anand Milk Union Limited) in Gujarat
- AMUL was founded in 1946. **Note:** India is largest producer of Milk in the world. Largest milk exporter is New Zealand.

Methods of Agriculture –

Pomo culture (Pomology) – Fruits	Olericulture – Vegetable
Viticulture – Grapes	Horticulture – Gardening
Silviculture – Forest vegetation	Fungiculture – Mushroom
Pisciculture – Fish	Sericulture – Silk and Silk Worm
Apiculture – Honey Bees	Floriculture – Flower
Vermiculture – Earthworms	Aviculture – Birds farming

Major Soil types of India –

- Soil is formed when rocks are broken down by the action of wind, water and climate. This process is called weathering
- Karewa (sandy loamy) soil is suitable for Saffron (Kesar) cultivation in Jammu and Kashmir.
- The destruction of the soil cover is described as soil erosion, it caused due to Deforestation (cutting the trees)
- The wearing off or carrying away of soil by the action of water or wind is also called soil erosion
- Soil erosion can be stopped by Afforestation (grow more and more trees)
- Earthworms is best friend of soil by loosening it and allowing more air to get in it. He also improves quality, fertility of soil.

Alluvial soil – Most fertile soil. Generally taken by rivers.

- Formed mainly due to silt deposited by Indo-Gangetic-Brahmaputra rivers. Found in Gangetic and coastal plains of India.
- Suitable for Wheat, Rice and Sugarcane. Covering about 46 per cent of the total area of India
- Bhabar (streams disappeared) and Tarai (stream appear again).
- Bangar or Bhangar (old alluvial soil) and Khadar (new alluvial soil).

Red and Yellow soil–

- Red color due to Iron Oxide or Ferric Oxide. Extent about 18.5% (2nd largest soil group). Red Soils contain high iron content
- Red Sanders (Lal Chandan) is grown in it.
- Found in Chhota Nagpur plateau area. Apart this also found in eastern and southern part of Deccan Plateau.

Black soil – Also known as Regur Soil or Volcanic Rock. Extent about 16.6%.

- Formed due to Basalt Rock and lava eruption. Best suitable for cotton, so it is also known as Black Cotton Soil.
- Black soil is called as self-ploughing soil Also suitable for Sugarcane, Onion, Grapes and Citric Fruits.
- Found in Maharashtra and Deccan Plateau.

Laterite soil – Laterite means Brick. Formed due to rock. This soil is best for making Bricks and Blocks.

- Found in heavy rainfall areas like Karnataka, Kerala, Odisha, patches of Western and Eastern Ghats.
- Suitable for Tea, Coffee, Groundnut, Cashew, Rubber, Spices etc.

Peaty, and Marshy Soil/Bog Soil – Formed where adequate drainage is not possible

- Rich in organic matter & rich in moisture content and has high salinity
- founded on Delta regions. Suitable for Jute, Rubber and big sized rice.

Mountain (Forest) soil – Found on hilly regions, foothills of mountains and steep slopes.

Arid or Desert soil – Found in desert regions like Rajasthan, Western Haryana, Gujarat and Southern Punjab.

Transport System in India –

Land Transport –

Road Transport – Second largest road network in the world. 1st USA, 2nd India, 3rd China, 4th Brazil and 5th Russia.

- India has nearly 64 lakh km of total road network.
- National Highways is maintained by National Highway Authority of India (NHAI) under Road and Transport Ministry
- National Highway Authority of India founded in 1995.

- State with largest road network – Maharashtra (17757 km), 2nd is UP and 3rd is Rajasthan
- Longest National Highway – NH-44 (Sri Nagar, J&K to Kanyakumari, Tamil Nadu)-3745 km.
- NH-44 formerly known as NH 7. NH 44 is also known as North-South Corridor.
- Smallest National Highway – NH 966B (formally known as NH 47A) in Kerala.
- Sher Shah Suri made Grand Trunk Road between Peshawar (Pakistan) to Kolkata (West Bengal).
- Border Road Organisation (BRO) was founded in 1960 for making roads on borders of India by PM J L Nehru.
- World's highest motorable road at Umling La pass in Eastern Ladakh, located at an altitude of 19,300 ft, made by BRO.
- It is also known as Chisumle and Demchok road.

Golden Quadrilateral (Quad)–

- Laid down the foundation stone by PM Atal Bihari Vajpayee in 1999.
- It connects Delhi, Mumbai, Chennai and Kolkata. Total length 5846 km.
- Bharat Mala Project is related to National Highways development.
- Bhupen Hazarika Setu is the largest bridge of India, on Lohit River in Assam

North-South and East-West Corridor –

- It passes the 17 states of India. North-South Corridor connects Sri Nagar (J&K) to Kanyakumari (Tamil Nadu)
- East-West Corridor connects Porbandar (Gujarat) to Silchar (Assam)
- North-South Corridor and East-West Corridor cross each other (meet) at Jhansi (Uttar Pradesh).

Railway Transport –

- First railway started at India in 16 April 1853 by Lord Dalhousie between Bombay (Bori Bunder) to Thane (34 KM).
- Fourth largest Railway network in the World after USA, Russia and China.
- First Electric Train was Deccan Queen between Bombay and Kurla (both in MH) in 1925
- First CNG Train was Rewari to Rohtak (both in Haryana) in 2015. CNG is considered as Clean Fuel.
- Longest train route in India – Vivek Express (Dibrugarh to Kanyakumari – 4233 km - 80 Hours and 15 Minute)
- First Engineless and fastest train – Vande Bharat Express or Train 18 (it is also first indigenous train of India)
- First Private Train – Bharat Gaurav.
- Indian Railways has **19 Zones**.
- Currently Fastest Train in India – Vande Bharat Express (180 km/h), 2nd – Gatimaan Express (160 km/h)

Metro Train –

- E. Sreedharan (Kerala) is known as Metro Man of India.
- First Metro Train in India – Kolkata Metro in 1984 by PM Indira Gandhi.
- Delhi Metro started in December 2002.
- First Water Metro – Kochi Water Metro at Kerala. Started by PM Narendra Modi.
- First Underwater Metro – Kolkata (West Bengal)
- Note – First Bullet train in India would connect Mumbai and Ahmedabad with help of Japan. Speed 320-350km/h

Airways Transport –

- Airport Authority of India (AAI) is responsible for Airways in India. AAI formed on 1 April 1995.
- Airways in India started in India 1911 between Prayag Raj to Naini (both in Uttar Pradesh)
- UDAN (Ude Desh ka Aam Nagrik) Scheme is related with Airways, started in 2016.

Major Airports in India –

- | | |
|---|---|
| • Indira Gandhi International Airport– New Delhi- Busiest and Biggest airport in India. | |
| • World's first solar-run airport is Cochin International Airport (Kochi, Kerala). | |
| • Kushok Bakula Rimpochhe Airport – Leh- Highest Airport of India | |
| • Jolly Grant International Airport – Dehradun, Uttarakhand | • Rajiv Gandhi International Airport – Hyderabad |
| • Chhatrapati Shivaji Terminus – Mumbai | • Subhash Chandra Bose International Airport – Kolkata |
| • Meenabakkam Airport – Chennai | • Kampagowda Airport – Bengaluru |
| • Birsa Munda Airport – Ranchi | • Guru Ramdas Airport (Raja Sansi) – Amritsar |
| • Lokpriya Gopinath Bardoloi Airport – Guwahati | • Sardar Vallabh Bhai Patel Airport – Ahmedabad |
| • Veer Savarkar International Airport – Port Blair | • Dabolim Airport – Goa |
| • Chaudhary Charan Singh International Airport – Lucknow | • Shaheed Baghat Singh International Airport – Chandigarh |

Waterways Transport in India –

- There are 13 Major Sea Ports (Bandargah) in India. 6 in West Coast, 6 in East Coast and 1 in Port Blair.
- List (west coast)- Kandla (Guj.), Mumbai and JNPT (MH), Mormugao (Goa), New Mangalore (Kr.), Kochi (Keralam)
- List (east coast)- Tuticorin, Chennai, Ennore (TN), Vishakhapatnam (Andhra P.), Paradip (Odisha), Kolkata (WB)
- Largest Port – JNPT- Jawaharlal Nehru Port Trust (Nhava Sheva) Mumbai.
- Kolkata-Haldia port is also known as Diamond Harbour (located on Hugli River). Mormugao port is on Zuari River.
- Kandla port is a Tidal Port. Ennore (TN) port another name is Kamarajar port.
- Sagar Mala project is related to development of Ports

Demography (Census) of India –

- First census in world by Sweden (1749), First Decade Census started by USA in 1790.
- India counts its population every 10 years (every Decade)
- First census in India – 1872 by Lord Mayo. First Regular Census – 1881 by Lord Ripon
- Indian Population – 121.09 crore (according to 2011 census). Males- 51.47% and Females- 48.53%.
- Population density of India – 382 per sq. km. Highest Density – 1st- Bihar (1106), 2nd- West Bengal, 3rd- Keralam.
- Least density - Arunachal Pradesh (17), Mizoram (52), Sikkim- (86).
- Sex Ratio - 943 Females per 1000 Male.
- State with Highest Sex ratio – Keralam (1084). State with least sex ratio – Haryana (879)
- Literacy rate of India – 74.04%
- Highest Literacy rate – Keralam (94%), 2nd – Mizoram, 3rd - Goa
- Least Literacy rate – Bihar (63%), 2nd- Arunachal Pradesh, 3rd- Rajasthan
- Mega City- Where population is more than 1 crore. Only three city is mega city- Delhi, Mumbai, Kolkata.
- Between 1911 to 1921, only decade when population got **Negative Growth**.

Major Tribes of India –

Largest Tribe of India – Bhil (means Bow)	Gonds – MP, Chhattisgarh- 2 nd Largest tribe of India
Santhals – Jharkhand, Bihar, WB- 3 rd Largest tribe of India	Munda (Sarhul famous festival)– Jharkhand
Meena (means Fish) – Rajasthan	Lepcha – Sikkim
Banjara, Kapu – Andhra Pradesh	Sahariya – Madhya Pradesh
Naga – Nagaland	Toda – Nilgiri Hills and Tamil Nadu
Onges, Sentinel, Shompen, Jarawa – Andaman & Nicobar	Tharu, Jaunsari, Buksa – UP and Uttarakhand
Abhor, Bodo, Lushai – Assam	Apatani, Abor, Mishmi – Arunachal Pradesh
Kuki, Meitei – Manipur	Reang – Tripura
Bhil, Kol – MP	Bakarwal, Gujjar – Jammu & Kashmir
Bhotia – Uttarakhand, Sikkim	Gaddi – Himachal Pradesh

Lakes of India –

- Largest freshwater lake – Wular Lake, Jammu and Kashmir (189 km²)
- Largest Saline water lake in India – Chilka Lake, Odisha (1165 km²)
- Note:** - Chilka is largest lake in India (Area wise). It is a lagoon lake or brackish lake.
- Highest lake in India (Altitude) – Cholamu lake, Sikkim
- Longest Lake in India – Vembanad lake, Keralam (96.5 km)
- Largest Artificial Lake in India – Govind Vallabh Pant Sagar (Rihand Dam), Uttar Pradesh
- Dhebar Lake is India's second-largest artificial lake. It is located in the Udaipur District of Rajasthan
- Most saline water lake (inland) – Sambhar (Rajasthan).
- Largest Lake of North East India – Loktak (Manipur). Keibul Lamjao National Park is located on Loktak Lake.
- Punnamada Lake (Keralam) is famous for Nehru Boat Race.
- Lonar Lake (Maharashtra) was created by an asteroid and it is known as Crater Lake.
- Satish Dhawan Space Centre and Sriharikota is in Pulicat lake (Andhra Pradesh).
- Kolleru Lake (Andhra Pradesh) is located between Krishna and Godavari River delta.
- Pushkar Lake (Ajmer, Rajasthan) is famous for Lord Brahma Temple. This is only Brahma Temple in the world.
- Kanwar Taal (Kabartaal) Lake, Bihar is the largest Ox-Bow Lake in India and Asia.

Pulicat, Kolleru, Nagarjuna Sagar Lake – Andhra Pradesh	Lonar – Maharashtra
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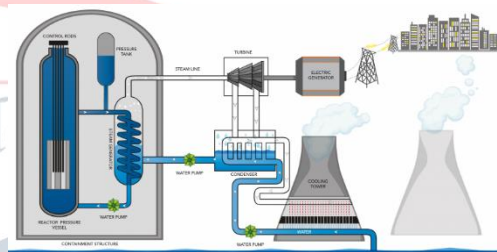
Loktak Lake – Manipur	Umiam, Barapani – Meghalaya
Badkhal, Suraj Kund, Brahma Sarovar Lake – Haryana	Hussain Sagar Lake – Telangana
Dal, Wular Lake – J&K	Panchmuli, Sardar Sarovar Lake, Nal-Neel Sarovar – Gujarat
Ashtamudi, Vembanad –Keralam	Pangong, Tsomarari Lake – Ladakh, J&K

Major Valleys of India –

Araku – Andhra Pradesh	Barak – Assam
Kullu, Chamba, Lahaul-Spiti, Kangra, Kinnaur, Pin Valley – Himachal Pradesh	Nelang, Valley of Flowers (Chamoli Distt) – Uttarakhand
Chambal – Madhya Pradesh	Kambam (Cumbum) – Tamil Nadu
Chumbi Valley (Doklam) – Sikkim	Nubra, Markha, Suru, Galwan – Ladakh
Dzoukou – Nagaland	Silent Valley (Shaant Ghati) – Palakkad, Keralam

Important Atomic Energy Stations in India–

- India has 22 Nuclear Energy stations (reactors) which are lies in 7 states.
- Nuclear reactor is based on **Nuclear Fission**. Uranium is used as nuclear fuel (U-238 and U-235)
- Heavy Water (Deuterium oxide - D₂O) or Graphite Rods is used as coolant and moderator in Nuclear Reactor.
- Asia's first nuclear reactor is Apsara Research Reactor situated in Mumbai.
- World's first thorium-based nuclear plant **Bhavni** (U-233) set up at Kalpakkam (TN). Thorium plant name is **Kamini**.



Tarapur – Maharashtra (Oldest) in 1969 (help with USA)	Rawatbhata (Chambal River)–Kota (Rajasthan), with Canada
Kalpakkam – Tamil Nadu (India's first indigenously)	Narora (Ganga River) – Uttar Pradesh
Kudankulam – Tamil Nadu (Largest in India) (with Russia)	Kaiga – Karnataka
Kakrapar (Tapi River) – Gujarat	Jaitapur – Maharashtra
Mahi- Banswara – Rajasthan	Mithi Viridi – Gujarat
Gorakhpur – Haryana	Chutka – Madhya Pradesh
Kovvada – Andhra Pradesh	Haripur – West Bengal

Important National Parks in India–

- There are 106 National Parks in India covering about 1.35% of total geographical area of India.
- Madhya Pradesh have maximum 11 National Parks followed by Assam (7).
- 1st National Park - Hailey NP, Uttarakhand (1937), renamed it Jim Corbett NP (1957), again renamed Ramganga NP (2021)
- Largest National Park is Hemis N.P (Ladakh, J&K) and Smallest National Park is South Button N.P (A&N Island)
- First National Park of the World is Yellowstone NP (USA). Largest NP of world - Northeast Greenland NP, Greenland
- India's first marine national Park – **Gulf of Kutch**
- Jammu and Kashmir** – Dachigam (Famous for Hangul or Kashmiri Stag), Salim Ali, Hemis N.P (famous for Snow Leopard)
- Uttarakhand** – Jim Corbett, Rajaji, Nanda Devi
- Rajasthan** – Keoladeo (famous for Siberian Crane), Ranthambore, Sariska,
- Gujarat** – Gir (famous for Asiatic Lions), Kutch National Park (famous for Wild Ass)
- Madhya Pradesh** – Pench, Panna, Kuno, Kanha, Dinosaur Fossil N.P
- Karnataka** – Bandipur (famous for Red Headed Vulture), Nagar Hole
- Odisha** – Bhitarkanika or Gahirmatha (famous for Olive Ridley Turtles), Simlipal
- West Bengal** – Sundarbans (famous for tigers), Buxa
- Manipur** – Keibul-Lamjao N.P (world only floating National Park. Float on Loktak Lake)
- Arunachal Pradesh** – Namdapfa (only N.P having big cat Tiger, Leopard, Snow Leopard and Clouded Leopard)
- Uttar Pradesh** – Dudhwa
- Meghalaya**– Nokrek
- Keralam** – Shola
- Assam** – Kaziranga (famous for One Horn Rhino), Manas N.P
- Goa** – Netravali
- Tamil Nadu** – Mannar N.P

• **Himachal Pradesh** – Great Himalaya N.P

• **Haryana** – Sultanpur (Famous for migratory birds)

Biosphere Reserves in India – Total 18 –

- Nilgiri – Kerala, Karnataka and Tamil Nadu (First Biosphere of India) in 1986
- Agasthyamalai – Tamil Nadu and Kerala
- Achanakmar-Amarkantak – Madhya Pradesh and Chhattisgarh
- Cold Desert – Himachal Pradesh
- Dehang-Debang – Arunachal Pradesh
- Nokrek – Meghalaya
- Kachchh – Gujarat (Largest Area)
- Seshachalam – Andhra Pradesh
- Nanda Devi – Uttarakhand
- Manas – Assam
- Panna – MP (Newest)
- Simlipal – Odisha
- Gulf of Mannar – Tamil Nadu
- Khangchendzonga – Sikkim
- Dibru-Saikhowa – Assam (Smallest Area)
- Pachmarhi – Madhya Pradesh
- Sundarbans (Mangroves) – West Bengal
- Great Nicobar – Andaman & Nicobar Island

Note: UNESCO (HQ- Paris, France) is responsible for Biosphere reserve in India and World from 1971.

• Khangchendzonga is only Mixed World Heritage Site.

Forest and Natural Vegetation in India –

- Lowest rainfall place in India – Leh. Highest rainfall in India – Mawsynram (Khasi Hills, Meghalaya)
- Forest type found in India – Tropical Deciduous Type Forest.
- Tropical Evergreen Forest – Very high rainfall (250+ cm every year).
 - Ex- Ebony, Mahogany, Rosewood, Rubber, Cinchona, Bamboo, Cedar etc.
 - Very high trees (more than 60 m)
 - Found in A&N Island, Kerala, North-East, Tamil Nadu
- Tropical Deciduous Forest – 100-200 cm rainfall
 - Ex- Sal, Teak, Sandalwood, Sheesham, Khair, Mahua, Laurel, Sagwan, Red Sanders, Tendu, Arjuna etc.
 - Very beneficial for human due to timber for buildings
 - Found on Shivalik foothills, Kerala, Lower Himalayas, Assam, Karnataka, Andhra Pradesh etc.
- Mangrove Forest found in West Bengal (42%), Gujarat (23%) and A&N Island (12%). Total Mangroves 4992km².
- Total Forest cover of India – 24.62%.
- Highest Forest area – Madhya Pradesh followed by Arunachal Pradesh (2nd), Chhattisgarh (3rd)
- Lowest Forest area – Haryana followed by Punjab (2nd last) and Goa (3rd last)
- Highest area in percentage – Mizoram (84.53%) followed by Arunachal Pradesh, Meghalaya.
- Indian State of Forest Report (ISFR) publish every two years from 1987, is responsible for Forest Records in India.

Oil Refineries in India –

- Petroleum is obtained from earth by drilling process. Petroleum is also known as Black Gold. 1 Barrel = 159 Litre.
- First oil refinery in India was Digboi (Assam) in 1901.
- Currently 23 oil refineries in India. Crude Oil (Petroleum) is obtained from Sedimentary Rocks.
- Jamnagar (Gujarat) is first private refinery and largest refinery in India. It is owned by Reliance Corp. of Mukesh Ambani.
- Oil is found in India at Assam, Gujarat, Rajasthan and Maharashtra.
- Oil is mainly obtained from Digboi (Assam), Bombay High (Maharashtra), Ankleshwar, Khambhat (Gujarat), Barmer, Jaisalmer and Bikaner (Rajasthan) and Krishna-Godavari Basin.

Energy Resources in India – Sun is the main source of energy.

Coal – Four Types- Anthracite (Best Coal), Bituminous (about 80% in India), Lignite and Peat (Lowest Coal)

• Anthracite is found only Reasi Distt of J&K. Dhanbad (Jharkhand) is known as Coal Capital of India.

Uranium – It is mainly found in Singhbhum, Hazaribagh and Jadugoda (Jharkhand), Tummalapalle Mine (Kudappa Distt of Andhra Pradesh) is the largest Uranium mine in India. Pitchblende is main ore of Uranium.

Thorium – It is mainly found in Kerala's Monazite Sand. It is also found in Odisha, Tamil Nadu and Andhra Pradesh.

Lithium – Mainly found in J&K and Rajasthan

Solar Energy – 500GW target of India by 2030. Bhadla Solar Park in Rajasthan is largest solar park in India. Apart this Tumkuru (Karnataka) also a solar park.

Geothermal Energy – Puga Valley (Ladakh), Manikaran (Himachal Pradesh) and Tapovan (Uttarakhand), Tatapani (Chhattisgarh) are main source of Geothermal Energy in India.

Wind Energy – Muppandal Wind Farm (Kanyakumari, Tamil Nadu) is largest wind energy farm in India. India is 4th largest wind energy resource after China, USA and Germany. Tamil Nadu, Kerala, Karnataka, Gujarat have also wind farms.

- **Renewable Source of Energy** – Solar Energy, Wind Energy, Hydro-power Energy, Ocean Energy, Tidal energy, Geothermal Energy, Biomass Energy, Biogas Energy etc.
- **Non-Renewable Source of Energy** – Coal, Natural Gas, Petroleum oil, Fossil Fuels, LPG, Minerals, Uranium and Nuclear Energy etc. They are the fossil and remains of plants and animals, once they were living organisms.
- Methane Gas (CH₄) is produced with Biogas (Gobar Gas)
- National Institute of Solar Energy is located at Gurugram, Haryana.
- Oldest Hydropower project – Sivasamudram (Karnataka) at Kaveri River.

Economy of India –

- India is a Mixed Economy and India is a Developing Country.
- Population depends on Agriculture – 50 to 60 %.
- Highest sector of GDP (Gross Domestic Product) – Service Sector
- GST (Goods and Service Tax) and Budget was first introduced by France.
- Every year Budget is presented by Finance Minister in Lok Sabha under Article 112 of Indian Constitution.
- Globalization Policy came in – 1991.
- BSE (Bombay Stock Exchange) and NSE (National / Indian Stock Exchange) are located at – Mumbai.
- Sensex is related to BSE. Nifty related to NSE. Bulls and Bears terms related to stock market.
- BSE and NSE listed under SEBI. HQ of SEBI at Mumbai. SEBI also control the Capital Market in India.
- First Newspaper – Bengal Gazette (James Augustus Hicky)
- First Hindi Newspaper – Udant Martand by Jugal Kishore in 1826
- Oldest running Newspaper – The Bombay (Mumbai) Samachar by Fardourji Marsban from 1822

Industries in India –

- In 1907 Tata Iron and Steel Company (TISCO) was setup at Sakchi (Now Jamshedpur) at Jharkhand near Swarn Rekha River
- Rourkela (Odisha), Durgapur (West Bengal) and Bokaro (Jharkhand) are famous iron and steel plants in India.
- First cotton mill in India – Fort Gloster at West Bengal (but it was failed).
- 1st successful Cotton Mill in India– Mumbai in 1854 by Cowasjee Nanabhoy Davar.
- 1st Silk Industry established in India at Howrah (WB) in 1832. Karnataka is the highest producer of raw silk in India.
- 1st Woolen Textile in India Kanpur (Uttar Pradesh) in 1876.
- 1st Jute Mill in India at Rishra, Near Kolkata (West Bengal). India is largest producer of Jute in World.
- 1st Sugar Industry in India Pratappur (Uttar Pradesh) in 1903.
- World maximum two wheelers (bikes) and Tractors are produced in India.
- 1st Rail equipment's industry established at Jharkhand in 1921. Rail Coach factory at Kapurthala (Punjab)
- Due to Information Technology (IT) industry and Computer revolution Bangalore is known as Silicon Valley of India.
- Plastic Industry is also known as Sunrise Industry.
- 1st cement industry in world – Portland (England, 1824). 1st cement industry in India– Porbandar.
- Largest cement producing state is MP, 2nd Andhra Pradesh and 3rd is Rajasthan.
- 1st Paper Industry in India at Serampore (West Bengal) in 1812. 1st paper mill in India at Baliganj (West Bengal) in 1867
- 1st Newsprint (Akhbari Kagaz) at Nepa Nagar, near Bhopal (MP)
- Cellulose is main raw material in Paper Industry.
- Chota Nagpur Plateau is known as Ruhr of India. Original Ruhr is located at Germany.
- Bauxite is obtained from Aluminum.

Major Passes in India–

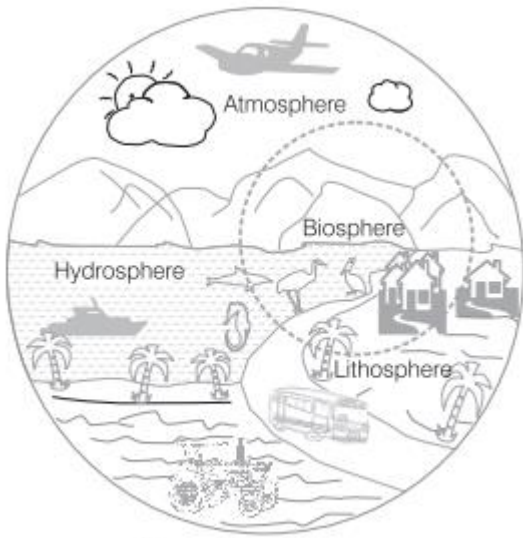
- **Jammu and Kashmir** – Banihal Pass (Jawahar Tunnel is located)
 - Umling La Pass – The world's highest motorable road passes through this pass (Project Himank)
 - Pir Panjal Pass, Aghil Pass and Zoji La Pass
- **Himachal Pradesh** – Rohtang Pass and Shipki La
- **Uttarakhand** – Lipulekh Pass (Kailash- Mansarovar travel), Mana Pass.
- **Sikkim** – Nathu La • **Arunachal Pradesh** – Bom Di La

Important Glaciers in India – The largest glaciers in world are Continental glaciers.

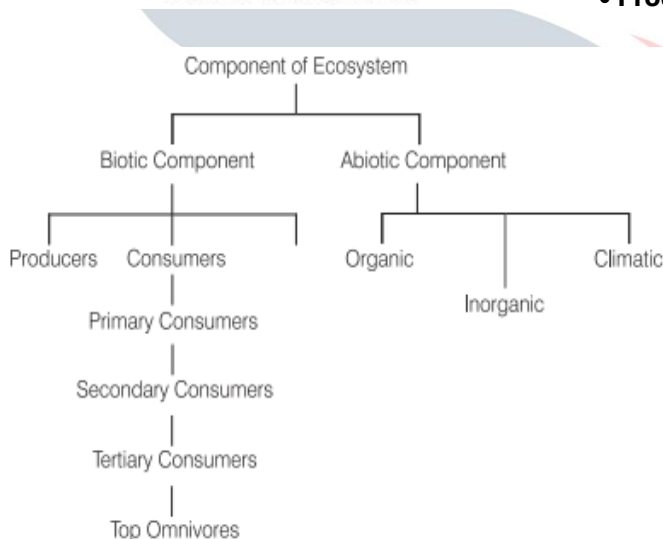
- Siachen Glacier (75 km long) – located at J&K (Nubra Valley). Highest battlefield of the world. World 2nd longest glacier.
- Biafo, Baltoro, Hispar Glacier – Jammu & Kashmir, Pakistan Occupied Kashmir (POK)

- Sonapani – Himachal Pradesh
- Zemu – Sikkim
- Pindari, Milam, Gangotri and Yamunotri Glacier – Uttarakhand
- Note: - Largest Glacier outside polar region is – Fedchenko (Eastern Tajikistan). The Lambert Glacier is in Polar Region.

ENVIRONMENT AND ECOLOGY –



Parts of Environment



- **Environment** – Environment is derived from the French word 'environ' which means our surroundings.
- Biosphere, Lithosphere, Hydrosphere and Atmosphere are part of environment.
- **Ecology** – Study of relation between organism and their environment.
- The term Ecology was termed by Ernst Haeckel in 1866
- **Ecosystem** – Particular category of organism in a particular area.
- The term was coined by – AG Tansley in 1935.
- Most stable ecosystem – Ocean.
- **Biome** – A large ecosystem or group of ecosystems.
- **Biosphere** – Part of earth where life exists. It is group of Biomes.
- Biosphere is the part of the earth which supports the biodiversity.
- **Components of Ecosystem**–
- Biotic Component – Living – Plants, Animals, Microorganisms.
- Abiotic Components – Non – Living – Water, Soil, Rock, Air etc.
- **Producers (Autotrophs)** – Who makes own food.
- **Consumers (Heterotrophs)** –Who depend on others for food.
- Primary consumers are Herbivores. Ex- Cow, Deer, Rabbit etc.
- Herbivores are also called the key of Industrial animals.
- Secondary consumers are Carnivores. Ex- Frog, Fish etc.
- Tertiary consumers are depending on secondary consumers.
- Omnivores are producers and consumers both. They eat Herbs and Flesh both. Ex- Human, Dog etc.
- **Decomposers** – Who decompose dead organisms. Ex- Vultures
- **Halophyte plants** – Plants in salty soil.
- **Xerophyte Plants** – dry condition plants.
- **Hydrophyte plants** – Aquatic Plants.
- **Succulent** – Plants found in desert.
- **Ozone Layer** –
- Discovered by Charles Fabry and Henri Buisson in 1913.
- Ozone hole was discovered by British scientist over Antarctica in

1985. Dobson Unit is used to measure Ozone Depletion.

- **Greenhouse Effect** – Concept given by – Joseph Fourier (France) in 1824.
- **List of Greenhouse Gases** – Carbon Dioxide (CO₂), Chlorofluorocarbon (CFCs), Methane (CH₄), Nitrous Oxide (N₂O), Ozone (O₃), Water Vapors
- **Types of Pollution** –
- **Water Pollution** – fertilizers, Chemical waste, waste from industries, an oil spill from a large ship etc.
- **Air Pollution** – gases like – carbon dioxide, CO, CFCs, Ozone, Sulphur dioxide, Nitrogen dioxide, Lead, Methene etc.
- Noise Pollution – Sound of more than 65 dB is considered noise and more than 80 dB causes pollution.
- **Fauna** – Animals of a particular region. • **Flora** – Plants of a particular region.
- **Endemic Species** – Animal or plant found in a particular place only.
- **Endangered Species** – whose habitat is in danger. Ex. One horn rhino, Bengal tiger etc.
- **Extinct Species** – Animals which are not found now and had disappeared.
- **Biodiversity** – Variety in living organisms and their species. Biodiversity word is coined by Raymond F. Dasmann
- **Biodiversity Hotspot** – Idea given by – Norman Myers in 1988. There are 36 hotspots in the world.

• India has 4 hotspots – Western Ghats, Eastern Himalayas, Indo – Burma (North-East region) and Sundaland (A&N Islands).

Wildlife Conservation Schemes by Government of India – Wildlife Protection Act – 1972

• **Project Tiger (1st April 1973)** – By PM Indira Gandhi. Currently 55 Tiger reserves in India.

- First Tiger Reserve (TR) in India – Jim Corbett in Uttarakhand.
- Nagpur (Maharashtra) is called as Tiger Capital of India.
- Largest TR– Nagarjunsagar Srisailem TR (Andhra Pradesh). Smallest TR Bor Wildlife Sanctuary (Maharashtra).
- Tiger census conduct every 4 years. In 2018 tigers were 2967. In 2022 tiger raised to 3167.
- Madhya Pradesh have maximum tigers (526), followed by Karnataka (524) and Uttarakhand (442).

• **Project Crocodile – 1975**

• **Ganga Action Plan – 1985 by G D Aggarwal (Environment Engineer)**

• **Environment Protection Act – 1986**

• **Project Elephant – February 1992.** 1st Elephant Reserve – Singbhum Elephant Reserve (Jharkhand) in 2001.

• Project MIKE (Monitoring the Illegal Killing of Elephants) is related with Elephant Conservation.

• Indian Elephant is Largest Mammal in Indian Subcontinent.

• India's First Elephant Village (Haathi Gaon) is Kunda Village near Jaipur, Rajasthan.

• **Project Red Panda – 1996**

• **National Water Policy – 2002**

• **Project Rhino – 2005**

• **Project Vulture – 2006** – Decline of Vulture Population due to diclofenac medicine (a pain killer for Animals)

• **National action Plan for climate change – 2008**

• **Project Snow Leopard – 2009**

• **National Green Tribunal (NGT) –18 October 2010** (Apex Environment court in India)

Current Chairman of NGT – Justice Prakash Shrivastava. Headquarters of NGT is located at New Delhi.

• **Bishnoi Movement** – 18th century against cutting of trees in Rajasthan. It was led by Amrita Devi.

• **Narmada Bachao Aandolan (Movement)** (1980s) – Against Sardar Sarovar Dam by Medha Patkar, Baba Amte and Arundhati Roy. Sardar Sarovar Dam is located on Narmada River in Gujarat.

• **Chipko Movement** – Chamoli District (Uttarakhand) in 1973 – against Tree cutting. It was led by Gaura Devi, Sunder Lal Bahuguna, Chandi Prasad Bhatt. Chipko means to Hug the Trees. Sunder Lal Bahuguna is also known as Vriksha Mitra.

• **Silent Valley Movement** (1978) – Palakkad district Kerala. It was led by Sughathakumari to protect Silent Valley.

• **Jangal Bachao Aandolan** (1982) – Singbhum Distt (Jharkhand) –Against replace Sal trees with Teak. Led by Tribe.

• **Appiko Movement** (1983) – Karnataka. To stop Cutting of natural trees. Led by Panderang Hegde, Lakshmi Narsimha

• **Waterman of India** – Rajendra Singh (water conservation technique in Rajasthan)

• **Birdman of India** – Dr. Salim Ali (made the Keoladeo National Park at Bharat Pur, Rajasthan)

• **Forest man of India** – Jadav Molai Payeng (Made Molai Forest in Assam)

• **Iceman of India** – Chewang Norphel (made 15 Artificial Glacier in Ladakh region)

• **Treeman of India** – Marimuthu Yoganathan

• **Mango man of India** – Kaleem Ullah Khan

• **Professor Madhav Gadgil** – Conserve the Western Ghats.

• **Pramod Patil** – Protect the Great Indian Bustard (state bird of Rajasthan). Found in Rajasthan and Gujarat. Pramod Patil won the Whitley Award of London. This award is also known as Green Oscar.

• **Mike Pandey** – Hero of Environment.

• **Note:** Baba Amte is the only Indian to have won the United Nations Award in the field of Human Rights in 1988

International Organizations Connected with Biodiversity Conservation –

• **United Nations Environment Programme (UNEP)–**

- Established in – 1972 at Stockholm (Sweden)
- Head Quarter (HQ) – Nairobi (Kenya)
- UNEP also started the World Environment Day on 5 June from 1974.
- Global- 500 prize is related with UNEP, given to the outstanding achievements in Environment protection.
- The Champions of the Earth award is also given by UNEP since 2005.

• **International Union for Conservation of Nature (IUCN)–**

- Established in – October 1948
- HQ – Gland (Switzerland)
- IUCN publish the Red Data Book from 1964.

• **World Wildlife Fund for Nature (WWF)–**

- Established in – 1961
- HQ – Gland (Switzerland)
- Slogan – For A Living Planet. WWF started the Earth Hour from Sydney (Australia)
- Symbol of WWF – Giant Panda

• **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)–**

- Established in – 1975
- HQ – Geneva (Switzerland)
- Elephant Tusks is show in CITES symbol.

• **United Nations Framework Convention on Climate Change (UNFCCC) –**

- Related with Climate Change
- Established in – 1992
- HQ – Bonn (Germany)
- Rio Earth Summit related with Climate Change. Agenda – 21 declare in this conference.
- Yearly conference of UNFCCC is known as COP (Conference of Parties). Currently 198 countries are members.
- Kyoto Protocol (1997) and Paris Agreement (2016) are related with UNFCCC
- International Solar Alliance was made after Paris Agreement by India and France in 2015.
- International Solar Alliance (ISA) headquarters is located at Gurugram (Haryana).
- 2024 COP will be held at Baku, Azerbaijan. It is 29th COP.

Note: First UN Summit on Climate Change was held at Stockholm (Sweden) in 1972.

• **Wetlands in India (Convention on Wetlands) –**

- Wetlands – Lands transitional between terrestrial and aquatic eco-systems
- Established in – 2nd February 1971 at Ramsar (Iran). 2 February is celebrated as World Wetlands Day
- There are 82 Ramsar Sites in India as of May 2023. 1st site was Chilka Lake (Odisha) in 1981.

• **Basel Convention – 1989 (on Hazardous waste)**

• **Minamata Convention – 2013 (on Mercury)**

• Brundtland Commission Report (Our Common Future) is related to – **Sustainable Development (1987).**

• Sustainable Development Goals – Total 17 SDGs (to be achieved by 2030)



• Natural Indicator of Air Pollution – **Lichen** (inform us about the concentration of Sulphur dioxide)

• **Amazon Rain Forest (South America)** – Located at Brazil. Area about 600000 km²

• About 20% of Earth Oxygen is produced by the Amazon Forest. So, it is also called as **Lungs of earth**

• Green Army Programme – Australia

- About 70% of total Oxygen of earth is obtained from – Oceans
- **Coral Reefs** –
 - Also known as Rainforests of the Sea. Supports over 25% of marine biodiversity.
 - Coral is made up of Calcium Carbonate (CaCO₃).
 - Coral is called polyps. Symbiotic relation with algae Zooxanthellae and make beautiful colors and reefs.
 - World largest Corel Reef is Great Barrier Reef of Australia (1900 km long) in Pacific Ocean (Eastern side of Australia)
 - In India coral reef is found at Gulf of Kutch, Lakshadweep, Gulf of Mannar, A&N Island.
 - Corel Bleaching – when algae Zooxanthellae leave corals, the coral turn into white. It is known as coral bleaching.
 - Coral Reefs protect coastline from storms and erosions.
 - Fringing Reefs, Barrier Reefs and Atolls are major types of corals.
 - Which animal is known as Sea Cow – Dugong.
 - India's 1st conservation reserve for the Dugong in Gulf of Mannar, Palk Bay (Tamil Nadu)
- **Crux of NCERT of class 3, 4 and 5th** –
 - Artist Vishnu Chinchalkar (Indore, Madhya Pradesh) made beautiful pictures using dry leaves
 - Which is our first school- Our Family
 - Rats have poor eye sights but have excellent sense of smell, touch and taste. Ant has very strong sense of smell. Ants recognize other ants from their group by strong smell. When ants died, they formed Ant Spiral of Death (circle) or Ant Mill
 - For Gandhiji's 150th birthday, the Swachh Bharat Abhiyan was launched on 2nd October 2014
 - In dance the hands and face are used to convey feelings. These are called Mudra's and Bhav's
 - Louis Braille (France) founded the Braille script. It is used for reading books by touching and feeling for Blind People's. This script is based on six points. In this script, a row of raised dots is made on a thick paper
 - In ancient times people learnt to make clay pots (Mitti ke Bartan). These clay pots could be made stronger by baking them in fire.
 - + Sign is used for Hospitals. Red Cross society (Henry Dunant) gave this + sign.
 - Pochampally sarees are made in Bhoodan Pochampally, located in the Yadadri Bhuvanagiri district of Telangana, India
 - In Ladakh there is a trolley (an open box made of wood) attached with the iron rope to cross the river.
 - In some parts of Keralam, students/ people use a Vallam (small wooden boat) to reach school other places.
 - An adult elephant can eat more than 100 kilograms of leaves and twigs in one day. They sleep for only two to four hours in a day.
 - Bishnoi Movement – 18th century against cutting of trees in Rajasthan. It was led by Amrita Devi. She was lived in Khejadli village near Jodhpur (Rajasthan). Khejadi Tree mainly found in Rajasthan and sacred for Bishnoi Tribe.
 - RTE-Act 2009- This provides the right of free and compulsory education to each child aged 6 to 14 years
 - Honeybees lay their eggs from October to December. Every beehive has only one Queen Bee that lays eggs
 - Malayalam speaks in Keralam, Kannada speaks in Karnataka, Konkani speak in Goa, Telegu speak in Andhra Pradesh.
 - Sanskrit is one of the official languages of Uttarakhand.
 - 'Madhubani' is a very old form of folk art of Bihar State.
 - The Kannauj district in Uttar Pradesh is famous for Itr (Perfume)
 - Khunti (an iron rod) to dig the soil, loosen it and make it soft. It is used in Karnataka.
 - The bullocks pull the Kurige. Kurige is a farming tool used for sprinkling of seeds in Karnataka.
 - Illige or sickle-knife is used to cut the dried leaves from the top of onions
 - Indian Robin lays eggs between the space of stones. Koel (cuckoo) does not make its nest.
 - One teaspoon sugar and a pinch of salt in one glass of boiled and cooled water is called ORS (Oral Rehydration Solution).
 - ORS (Salt and Sugar) solution is given when a person has vomiting and loose motions
 - Father of ORS is Dilip Mahalanabis. He was born in Bengal Province of British India (Now Bangladesh)
 - Hanging branches are actually the roots of the Banyan Tree
 - Desert Oak is a tree that is found in Australia. The roots of this tree go deep into the ground till they reach water. The local people of Australia use to put a thin pipe into the trunk of this tree, to drink this water.

- Magh Bihu is celebrated on 14 and 15 of January (1st and 2nd Magh, the tenth month of Assamese calendar). The first day is called Uruka, and that day people build a temporary shed called Bhela Ghar and have a community feast. Bora is a common variety of rice used in Assam. These are 'sticky' rice. Cheva rice prepared with 'tao' (a big vessel called Kadhahi). The women were dressed in pat and Muga mekhala-chador. Mezi is fire.
- Bhat-shukto (rice with vegetable and gravy) used in Assam villages.
- Mid-day Meal-All children up to elementary school (class 1 to 8) should be provided hot, cooked food.
- The 'cooking and eating together' in a Gurudwara is called langar. After this kadhah prasad (Halwa) also given.
- Like Pochampalli Sarees (Andhra Pradesh) so many places famous for making special things like Kullu shawls (Himachal Pradesh), Madhubani paintings (Bihar), Assam silk, Kashmiri embroidery (J&K), etc.
- Chittappan – Father's younger brother (uncle) in Malayalam. Kunjamma – Father's younger brother's wife in Malayalam
- "We used to see only one kind of tree at Abu Dhabi – the date palms – because it is the only one that can grow in the desert. The date is the most common fruit in Abu Dhabi.
- The money used in Abu Dhabi was called Dirham. It had some writings in their local language – Arabic.
- Lieutenant Commander Wahida Prism, doctor in the Indian Navy. She is the first woman to lead a parade. She was belonging from Thannamandi Village of Rajouri district (J&K). A prism is a kind of glass which reflects seven colors. So, Prism name given by Wahida's father to shine over the world.
- In a parade, four platoons march behind the leader. Thirty-six commands have to be given during the entire parade
- Silk worm can find female worm from many kilometers away by smell.
- When a bird focuses both eyes on an object, it can estimate the distance. When its eyes focus on two different things, it increases its range of vision.
- Some birds like kites, eagles, vultures can see four times as far as we can. These birds can see things from a distance of eight meters what we can see from a distance of two meters
- Snakes do not have external ears. They only feel the vibrations on the ground
- High up on a tree, a langur warns others of dangers like a tiger or leopard. The langur does this by making a special warning call (Sounds). Birds also give alarm calls to warn about the danger. Some birds even have different sounds for different kinds of dangers. Fishes give alarm call by electric signals
- Sloth-looks like a bear but is not. It spends almost 17 hours a day sleeping while hanging upside down on a tree branch. The sloth eats the leaves of same tree on which it lives. Sloths live for about 40 years and in that time, they move around only eight trees. Once a week it comes down from the tree to relieve itself.
- A tiger can see six times better at night than most of us. The tiger's whiskers are very sensitive and can sense the movements or vibrations in air. Tigers make different sounds for different purposes like when it is angry or to call out to a tigress. It can also roar or snarl. Its roar can be heard upto 3 kilometres away. Each tiger has its own area which may cover several kilometres. Tigers mark their area with their urine.
- To protect the tigers and animals, our government has made some forests as protected areas. Some of them are the Jim Corbett National Park in Uttarakhand and 'Ghana' in Bharatpur district of Rajasthan
- Elephants are killed for their tusks, rhinoceros for its horn, tigers, crocodiles and snakes for their skins. Musk deer are killed just to make a little scent from its musk. People who kill animals are called hunters and poacher.
- Been, tumba, khanjiri and dhol used in Been or Pungi party. Except dhol all the other three instruments are made from dried gourd (lauki). Snake charmers used pungi or Been to make snakes dance.
- Only four types of snakes are poisonous in India: Cobra, Common Krait, Russel's Viper (Duboiya), Saw-scaled Viper (Afai). A snake has two hollow teeth (fangs). Snake medicine is known as Antidot.
- Our stomach normally temperature is about 30°C. Food digests faster in the stomach than outside (Story of Soldier Martin and Dr. Beaumont- A Stomach with a Window)
- Mamidi Tandra is common name of 'Aam Papad' in Andhra Pradesh made from ripe mangoes. It takes four weeks for prepare Aam Papad
- The Pitcher plant (Nepenthes) is a trap plant. It is found in Australia, Indonesia and Meghalaya in India.

- George Mestral (Switzerland) made Velcro in 1948
- Tomato, Potato, Groundnut, Guava and Green Chili came from South America by Portuguese.
- Cabbage and Pea came from Europe. Coffee Bean and Green Bhindi (Okra) came from Africa.
- Soyabean came to India from China.
- King Ghadsi of Jaisalmer made Ghadsisar. Sar means a lake or Sarovar. Nine big lakes made by King Ghadsi
- Nehru Institute of Mountaineering (NIM) is located at Uttarkashi (Uttarakhand)
- Sling is a type of hook which is tied in waist to cross something like River or a hill or mountain
- When we coming down from mountain with help of the use of rope is called 'Rapling'.
- Bachendri Pal (born 24 May 1954, Nakuri village of the Uttarkashi district of Uttarakhand) was became the first Indian woman (5th world) to climb the Mount Everest on 23 May 1984. Her guide's name is Brigadier Gyan Singh.
- Shital Mahajan is first Indian woman to skydive in front of Mount Everest in 2024.
- 'Jule- Jule' called in Leh which meaning 'welcome, welcome'
- 'Changthang' is a rocky plain located in Leh-Ladakh (J&K) about 5000 m height from sea level. There are Changpa tribe living. In the language of the Changpa 'changthang' means a place where very few people live. They call their tent Rebo. Near the Rebo there are a place to keep sheep and goats, it is called Lehka.
- Pashmina wool is obtained from Changthangi goat by Changpa tribe. Pashmina shawl is as warm as six sweaters. After almost 250 hours of weaving, one plain pashmina shawl is made with only hands not by the machines.
- Tourists who come to Srinagar love to stay in houseboats. Houseboats can be as long as 80 feet & around 8 to 9 feet wide.
- Beautiful carving on wood is seen on ceiling of houseboats. This design is called 'khatamband', which has a pattern that look like a jigsaw puzzle.
- Some old houses in J&K have a special type of window which comes out of the wall. This is called 'dab'. It has beautiful wood pattern.
- Blow Hot, Blow Cold (usi se thanda usi se garam) story written by Dr. Zakir Hussain, (3rd President of India)
- Mahatma Gandhi was against untouchability. Gandhiji had a friend Mahadevbhai Desai. Mahadevbhai's son name was Narayanbhai Desai. His book name was Sant-Charan-Raj, Sevita, Sahaj (in Gujarati language)
- Nagpada Basketball Association is located in Mumbai, Maharashtra. 'Bacchu Khan playground' is located in Mumbai on the name of Mustafa Khan.
- One-room shack is called Kholi in Mumbai
- Good seeds of Bajra (millets) stored in dried gourd (lauki) which are coated with mud. Also put the Neem leaves inside it, to protect from insects. Neem leaves also protects many types of seeds stored by people from ancient times.
- Undhiya means Ulta in Gujarati (a kind of stew or soup)
- We can used water that has been used once like Mopping the floor, Washing hands and face, Watering plants but we cannot used it after Using in the toilet.
- Croton plant has the gold dust and thin leaves. This plant used in big farms because the roots of Croton plants do not go deep in the ground. So, if the top layer of soil becomes dry, the croton leaves bend and become limp.
- Earthworms are the soil's best friends. The earthworms soften the soil as they keep digging underneath to make tunnels. This way air and water can easily get into the soil. The earthworms also eat the dead leaves and plants, and their droppings (toilets) fertilize the soil. Earthworms also turn the waste into compost (a natural fertilizer).
- In ancient times Bajra cobs (Bali) put in the mortar (Okhli, used for crushing). The cobs are crushed with a pestle (Moosli) and the seeds are separated from the cob. But nowadays, it is done with help of Threshers.
- Threshing is the mechanical separation of edible grain from the straw of the harvested crop.
- In Jharkhand, the children go into the forest. There they jump, run, climb trees and sing songs in their language called Kuduk. Kuduk is also a community in Jharkhand. 'Torang' means jungle (forest) in the Kuduk language.
- Right to Forest Act 2007- People who have been living in the forests for at least 25 years, have a right over the forest land and what is grown on it. They should not be removed from the forest.
- 'Three tin' of land in Mizoram-The land on which we grow one tin of seeds is called one tin of land."

- 'Cheraw' dance is celebrated in Mizoram. In this dance people sit in pairs in front of each other, holding bamboo sticks on the ground. As the drum beats, the bamboos are beaten to the ground. Dancers step in and out of the bamboo sticks, and dance to the beat.
- Puranpoli- A type of sweet roti made from jaggery and gram (chana) eaten in Maharashtra
- Trolley - An open box made of wood tied tightly with rope, used in Ladakh to cross the river. A pulley helps the trolley to move across the rope. It is easier to pull something with help of pulley. For example – pull a bucket of water from well.
- On Mountain region the paths are rocky and uneven. So, Children who live in the plains find difficulty to walk on the mountains.
- Sanjana found that as a seed germinates and seedling turns into a young plant, the size of the seed leaves gradually becomes smaller. It is because the food in the seed leaves has been used by the growing plant.
- Taanka or Kunds is a traditional rainwater harvesting technique of Rajasthan. 1st constructed in 1607 by Raja Sursingh.
- Pran Kumar Sharma created the legendary comic character of "Chacha Chaudhary". He also creates Sabu, Shrimatiji, Pinki, and Billoo.
- List of Geometric Shapes/ Sides – Triangle (3), Square & Rectangle (4), Polygon (5), Hexagon (6), Heptagon (7), Octagon (8), Nonagon (9), Decagon (10), Hendecagon (11), Dodecagon (12), Pentacontagon (50), Hecatontagon (100).
- Public Goods – A public good is a commodity or a service provided to the Citizen without any intention of making a profit. For Example – Education, Infrastructure, National Defence, Lighthouses, Flood Control Systems, Knowledge, Fresh Air, Parks, National Security. Electricity is not a public good, it's a private good.
- Scotland, England and Wales are called England. If we add Northern Ireland in it, is called United Kingdom. BREXIT word is associated with United Kingdom (Britein) is exit from the European Union (EU).
- Vehicles of Gods – Indra (Airawat Elephant), Ganesha (Mouse), Shiva (Nandi Bull), Brahma (seven swans), Lakshmi (Owl), Shani (Crow), Yama (Male Buffalo), Maa Durga (Lion), Kartikeya (Peacock)

INDIAN POLITY AND GOVERNANCE



सत्यमेव जयते

Indian Constitution – Father of Indian Constitution- Bhim Rao Ambedkar

- Idea of the constitution – Manvendra Nath Roy (M. N. Roy) in 1934
- Organs (Branches) of the Government India and most countries- Legislative, Executive, and Judiciary

Constituent Assembly (Savidhan Sabha) – Formed after Cabinet Mission Plan -1946.

- Members of Cabinet Mission from British- Sir Pethick Lawrence, Sir Stafford Cripps, AV Alexander
- Total Member in Constitution Assembly – 389.
- First meeting – 09-December-1946 (Temporary / 1st Interim President– Sacchidananda Sinha)
- Second Meeting – 11-December-1946 (Permanent President– Rajendra Prasad)
- Objective Resolution given by J L Nehru on 13 December 1946
- Vice- President– HC Mukherjee and V. T. Krishnamachari.
- Constitutional Advisor– B N Rau (Rao)
- Indian Constitution was completed and adopted on – 26 November 1949
- Indian Constitution came into force on – 26 January 1950
- Republic Day – 26 January every year.

- Total time to complete Indian Constitution– 2 Years, 11 months and 18 days.
- When India constitution was adopted there was 395 Articles, 22 Parts and 8 Schedules.
- But now India have 450+ Articles, 25 Parts and 12 Schedules.
- Interim Government (Mock Government) was formed during constitution assembly.
- Head of Interim Government – Jawahar Lal Nehru.
- **Note:** - Mahatma Gandhi and MA Jinnah were **Not** part of the Constituent Assembly
- Drafting Committee formed on 29th August 1947 to prepare the draft of Constitution
- Drafting Committee chairman – BR Ambedkar (Total 7 members with Ambedkar)
- Other members – Alladi Krishnaswamy Ayyar, N Gopalaswami Ayyangar, Dr KM Munshi, Syed Mohammad Saadullah, N Madhava Rao (replaced BL Mitter) and TT Krishnamachari (replaced DP Khaitan)
- On 3rd June 1947 Lord Mountbatten proposed the **Mountbatten Plan or 3rd June Plan**.
- According to this plan India divided into two parts i.e., India and Pakistan. Pakistan and India got freedom on 14 August and 15 August 1947 respectively.
- After independence First Governor General of free India was Lord Mountbatten and Pakistan was Mohammed Ali Jinnah.
- First Prime Minister of Pakistan was- Liaqat Ali Khan
- First President of Pakistan was- Iskandar Mirza (23 March 1956)

First Cabinet of Free India on 15 August 1947 –

Member

Pt Jawaharlal Nehru
Sardar Vallabhbhai Patel
Dr Rajendra Prasad
Maulana Abul Kalam Azad
Dr John Mathai
RK Shanmugam Chetty
Dr BR Ambedkar
Jag Jivan Ram
Sardar Baldev Singh
Rajkumari Amrit Kaur

Portfolios Held

Prime Minister, External Affairs and Commonwealth Relation
Home, Information and Broadcasting
Food and Agriculture
Education
Railways and Transport
Finance
Law
Labour
Defence
Health

Salient Features of the Indian Constitution –

- Largest and Longest written constitution
- Parliamentary Government
- Independent Judiciary
- Emergency Provisions
- Universal Adult Franchise (Voting Rights)- Every citizen who is above 18 years of age (earlier it was 21 years but reduced as per 61st Amendment Act, 1989). Now minimum voting age in India is 18 years.
- **Note-** World First and Oldest unwritten constitution was England's Magna Carta on 15 June 1215
- First country to prepare a written constitution was USA (17 September 1787)
- **Sources of the Constitution –**

The Main and Fundamental sources of constitution was Government of India Act of 1935

- Britain – Parliamentary Government, Bicameralism, Rule of Law, Cabinet System
- USA – Preamble, Fundamental Rights, Supreme Court, Vice President, Impeachment of President
- Canada – Federal system.
- Ireland – Election of the President, DPSP
- Germany – Emergency Provisions
- USSR (Russia) – Fundamental Duties.
- Australia – Concurrent List

The Preamble –

- Introduction to the constitution or its identity card or contains the summary of Indian Constitution
- Based on Objective Resolution passed by JL Nehru. Preamble is considered as **Soul of the Constitution**
- Contains Justice, Liberty, Fraternity, Secular, Integrity
- Preamble amend only one time by 42nd Constitutional Amendment Act (1976) added **Socialist, Secular and Integrity** (Total 4 word but meaningful 3 words).

- Starting of Preamble with **WE, THE PEOPLE OF INDIA (Hum, Bharat Key Log).**
- The date is mentioned in Preamble is 26 November 1949 (Shukla Saptmi, Samvat 2006 Vikarmi)

Integration of the Indian States –

- When India got freedom there was 552 Provinces (Riyasats). 549 was integrated easily in India but three provinces – Junagarh (Referendum or Janamat Sangrah), Hyderabad (Operation Polo or Police Action) and Jammu- Kashmir (Letter of Merger/ Accession) added in India. At that time King of Kashmir was **Raja Hari Singh**.
- Dhar Commission, Fazal Ali Commission and JVP (JL Nehru, Vallabh Bhai Patel and Pattabhi Sitaramayya) committee was related to reorganization of states. In 7th Constitution Amendment, 1956 there was 14 States and 6 UTs in India.
- Some states separation- Haryana from Punjab (1966), Chhattisgarh from MP, Jharkhand from Bihar, Uttarakhand from UP, Andhra Pradesh from Madras, Telangana from Andhra Pradesh.
- First state formed on the Basis of Language (first Linguistic state)- Andhra Pradesh (1 October 1953)
- Today there are 28 States and 8 Union Territories (UT) in India.

Part – 1 – Union and Its Territories (Article 1-4)

- Article 1 of our Constitution which refers to our country as **India** that is **Bharat**.

Part – 2 – Citizenship (Article 5-11)

- Like Britain, in India Single Citizenship is practiced (USA have dual citizenship)
- Citizenship Act was passed in year 1955 (amended in 2019)
- There are **Five** ways to acquire citizenship of India-
 1. By Birth- If he/ she is born between 26-1-1950 to 1-7-1987
 2. By Descent- If he/ she born between 26-1-1950 to 10-12-1992 and his/ her father citizen of India.
 3. By Registration- Minimum **Seven Years** spent in India.
 4. By Naturalisation- Certain conditions by Govt of India.
 5. By Incorporation of Territory- If any new territory becomes a part of India.
- There are **Three** ways to Lose/ Termination the citizenship of India-
 - By Renunciation- 18+ Person declaration renouncing his citizenship in the prescribed manner
 - By Termination- if an 18+ (Adult) person voluntarily acquires the citizenship of another country
 - By Deprivation- Unlawfully trade or communicate with an enemy, if registration was obtained by Fraud

Part -3 – Fundamental Rights (Mool/ Maulik Adhikar) (Article 12-35)

- Considered the **Magna Carta** of Indian Constitution
- France was the first country to add Fundamental Rights in their constitution in 1789.
- The Fundamental Rights are **Justiciable** in Courts.
- There are **Six** Fundamental Rights.
- Fundamental Rights are taken from **USA Constitution**.
- 1. Right to Equality (Art. 14-18)**
 - 14 – Equality before law or equal protection of law.
 - 15 – Prohibition of discrimination on grounds of Caste, Religion, Race sex or Place of Birth
 - 16 – Equality of Opportunity in matters of public employment
 - 17 – Abolition of Untouchability
 - 18 – Abolition of Titles except military and academic
- 2. Right to Freedom (Art. 19-22)**
 - 19 – Right to freedom (6 freedoms like freedom of speech, assembled peacefully without arms)
 - 20 – Protection in respect of conviction for offences
 - 21 – Protection of Life and personal liberty (Right to Education, Right to Food, Right to Water)
 - 21-A – Right to elementary Education (6-14 years children)
 - 22 – Protection against arrest and detention
- 3. Right Against Exploitation (Art. 23-24)**
 - 23 – Prohibition of Human Trafficking and forced Labour
 - 24 – Prohibition of Child Labour below the age of 14 at factories
- 4. Right to Freedom of Religion (Art. 25-28)**
 - 25 – Right to Freedom of Religion (practice and propagation of religion)

- 26 – Freedom to manage religious affairs like property, institutions etc.
- 27 – Freedom from taxation
- 28 – No religious instruction in state-maintained institutions.

5. Cultural and Educational Rights (Art. 29-30)

- 29 – Protection of Interest of Minorities like language, script and culture etc.
- 30 – Right of Minorities to establish educational institutions

6. Right of Constitutional Remedies (Art. 32)

- 32 – Provides institutional framework for enforcement of Fundamental Rights by the Supreme Court
- Also called the **Heart and Soul of the Constitution** by **Bhim Rao Ambedkar**

Note: – **Right to Property** was the 7th Fundamental Right (Art. –31) was deleted by the 44th Constitutional Amendment Act 1978 and made it a **Legal Right** under **Article 300-A** in **Part XII** of Constitution.

Part – 4 – Directive Principles of State Policy-DPSP (Art. 36-51) –

- DPSP is taken from **Ireland** Constitution of 1937 which had copied it from the Spanish Constitution.
- Directive Principal are divided into Socialist, Gandhian and Liberal Principles.
- Article 40 – Organisation of Village Panchayat. Article 44 – Uniform Civil Code for the citizens
- Article 45 – Early Childhood care. Article 48 – Organisation of agriculture and animal husbandry
- Article 50 – Separation of Judiciary from Executive. Article 51 – Promotion of international peace and security

Part – 4 A – Fundamental Duties –

- Added by 42nd amendment Act 1976 by recommendation of Sardar Swaran Singh Committee.
- Prime Minister at that time was **Indira Gandhi**.
- It added a new part IV-A and Article 51A in the Constitution of India
- Originally 10 in number. 11th duty was added 86th Constitutional Amendment, 2002.
- 11th fundamental duty is Education for 6 to 14 years children.
- Education for 6 to 14 years children are both Fundamental Duty and Fundamental Right.

Part – 5 – Union Executive (Art. 52-151) –

The President –

- First Citizen of India.
- Minimum Age – **35 Years**.
- Tenure – **5 Years**
- Elected by **MP's and MLA's**. Not directly elected by public (Indirect Election)
- Supreme Commander of Indian Armed Forces.
- Resignation – to Vice President
- First President of India – Dr. Rajendra Prasad
- Current/ Presently President of India – Draupadi Murmu (15th)
- Impeachment –Removal process of the President (Art- 61), Remove only for Violation of the Constitution
- Executive Head of the State
- Maximum Age– **No Limits**
- Salary – 5 Lakh rupees per month (without tax)
- Oath – By the Chief Justice of India.

Facts about President of India–

Dr. Rajendra Prasad – First President, Longest Tenure (12 years), only president who elected twice.

Dr. Sarvepalli Radhakrishnan – First Vice-President who became president

Dr. Zakir Hussain – First Muslim President, Shortest tenure.

V V Giri – First acted President and first acting president who become the President of India

Justice M Hidayat-ul-lah – 2nd acting president, the only CJI who become the president of India.

Fakhruddin Ali Ahmed – President during Emergency imposed in India (25 June 1975) by PM Indira Gandhi.

Neelam Sanjeeva Reddy – Only unopposed elected president.

Giani Zail Singh – First Sikh President, only president who used Veto Power

K R Narayan – First Dalit President

Dr. APJ Abdul Kalam – First scientist who become the President of India

Pratibha Devi Singh Patil – First female president

Draupadi Murmu – 2nd female president, 15th President from 25 July 2022, First Tribal President,

- Come from Odisha Mayurbhanj Distt Uparbeda village, belong to Santhal Tribe

- First President born after Independence, Youngest President.

Powers of the President –

- Emergency Powers- President can declare three types of emergencies- National Emergency (Article 352), President's Rule (Articles 356) and Financial Emergency (Article 360).
- All the constitutional posts are appointed by him like PM, Governor of states, Judges of SC & HC
- All executive action is taken in his / her name. Make regulation for UTs
- President also appoints Attorney General of India, CAG, Chief Election Commission, UPSC Chairman and Members, Chairman and Members of Finance Commission, Head of Army, Navy and Air Force.
- President has final assent (sign) to the bill passed by both the houses of the Parliament.
- Veto Power (Four types of veto- Absolute, Qualified, Suspensive and Pocket)
- Grant Pardon (Maafi Dena)- 5 Types of Pardon-
- **Pardon**- Complete absolves the guilt of the offender
- **Reprieve**- It is stay of death sentence pending on the appeal of pardon or commutation
- **Respite**- Awarding a lesser sentence on special ground e.g., pregnancy of a woman offender
- **Remission**- reduction of the amount of sentence without changing the nature of punishment
- **Commutation**- Death Sentence to Life Imprisonment

Vice President–

- Ex – Officio Chairman of the Rajya Sabha.
- Elected by the **MPs only** (Members of both houses of Parliament)
- Tenure– 5 Years
- Resignation – to President
- First Vice-President of India- S. Radhakrishnan
- Current/ Presently Vice-President of India- Jagdeep Singh Dhankar (14th)
- Minimum Age – **35 Years**
- Oath – By the President of India
- Salary – 4 lakh rupees per month (without tax)

Prime Minister–

- Head of the Government/ Leader of the House – **Prime Minister**
- First Prime Minister of India – **Pt. Jawahar Lal Nehru** (Longest Serving- 17 years)
- Current/ Presently Prime Minister of India – **Narendra Damodar Das Modi (15th)**
- Prime Minister is appointed by President of India. Head of Council of Ministers. Also head of Cabinet
- Must be a member of either house. Minimum Age for become Prime Minister of India – **25 years**
- Tenure – **Till Lok Sabha**. Oath – **By the President**
- PM is also Chairman of **NITI Aayog**

Facts about Prime Ministers (PM) of India–

- Pt. Jawahar Nehru** – First PM of India, Longest tenure- 17 years (15 Aug. 1947 to 27 May 1964)
- Gulzari Lal Nanda** – First acting PM, 1st to become acting PM twice after death of Nehru and Shastri ji.
- Lal Bahadur Shastri** – Only Prime Minister to die abroad during an official tour, PM during 1965 Indo-Pak war.
- Indira Gandhi** – First & only female PM, 1st PM who from Rajya Sabha, PM during 1971 Indo-Pak war (Bangladesh formed)
- Morarji Desai** – Oldest PM-81 years, 1st non-Congress PM
- Charan Singh** – Only Prime Minister who did not face the Parliament
- Rajiv Gandhi** – Youngest PM- only 40 years.
- Dr. Manmohan Singh** – First Sikh PM
- Narendra Modi** – First PM born after Independence

Deputy Prime Minister –There is no mention of Deputy Prime Minister in the Constitution. Deputy PM is appointed due to political reason. There are **Seven** Deputy PM till now - 1st Vallabh Bhai Patel, Morarji Desai, Charan Singh and Jagjivan Ram (Jointly), YB Chaudhan, Devi Lal and LK Advani (Last)

The Parliament or Sansad Bhavan or Supreme Legislative Body (Art. 79-122)

- Old Parliament was designed by **Edwin Lutyens** and **Herbert Baker**, Start in 1921 and Complete in 1927
- Original name of the Parliament was Council House. The circular shape of the Parliament had inspired from the shape of Chausath Yogini Temple in Morena, Madhya Pradesh
- Indian Parliamentary system is taken from Britain.
- USA parliament name is Congress. Upper and Lower House of USA Senate and Representative respectively
- World largest parliament - China (3000 MPs). World smallest parliament - Micronesia (Oceania) with just 14 MPs

- Indian Parliament consists of three parts- Lok Sabha, Rajya Sabha and President
- Members of Parliament is known as- **MPs**
- Rajya Sabha – Upper house or Council of States
- Lok Sabha – Lower House or House of the People
- New building for Parliament – Central Vista. It is inaugurated by PM Narendra Modi on 28 May 2023.
- Old Parliament building shape was Circular but New Parliament (Central Vista) shape is – Triangular
- Bimal Patel (Gujarat) is architect of new Parliament (Central Vista).
- Only Parliament can amend the constitution and make laws; it also fixes the salaries and allowances of the members.



Rajya Sabha (Art. 80)

- Rajya Sabha – **Upper House of Parliament**
- First constituted on 13 May 1952 and it **Cannot be Dissolve**. Current Rajya Sabha- **1st**
- Maximum Strength –**250**
- Current Members– **245 (229 from states + 4 from UTs and 12 Nominated by President)**
- Rajya Sabha does not have any reservation for SCs and STs.
- Minimum age – **30 years**
- Tenure – **6 Years**.
- Elected by **MLAs of states**.
- 1/3rd of members retired every 2 years and new members added in Rajya Sabha
- Nominated by President – **12 members**.
- Maximum seats – **Uttar Pradesh (31)** followed by **Maharashtra (19), Tamil Nadu (18)**
- Rajya Sabha head is known as– **Chairman**, and Chairman of Rajya Sabha is – **Vice-President**
- First Chairman of Rajya Sabha was– **Dr. S. Radhakrishnan**
- Current Chairman (Vice-President) – **Jagdeep Singh Dhankar (14th)**
- First woman to be nominated to the Rajya Sabha – **Rukmini Devi Arundale**

Lok Sabha (Art. 81)

- Lok Sabha – **Lower House or House of Commons or Popular House**
- Maximum strength – **550 (530 from states and 20 from UTs)**
- Earlier 552, but in 2019 (104 constitutional amendment) **Seats of 2 Anglo-Indians** removed.
- Elected/ Current members – **543 (530 from states and 13 from UTs)**
- **Schedule Castes (SC) Seats in Lok Sabha – 84 and Schedule Tribe (ST) Seats are – 47**
- Tenure – Unless dissolved.

Note: Lok Sabha can be dissolved earlier if opposition party passed the **No Confidence Motion**

- Minimum age – **25 years**
- Members are elected by people (public) in direct election on the basis of **Universal Adult Suffrage**
- Maximum seats – **Uttar Pradesh (80)** followed by **Maharashtra (48), West Bengal (42)**
- Minimum Quorum for Lok Sabha is **1/10 of total members**
- Lok Sabha head is known as– **Speaker**
- First Speaker of Lok Sabha was– **Ganesh Vasudev (GV) Mavlankar**
- Current/ Present Speaker – **Om Bidla (Birla)**
- First female Speaker of Lok Sabha – Meira Kumar (2009-2014)
- Current Lok Sabha– 18th in number.
- Money Bill introduced only in – Lok Sabha
- Pro-tem speaker – temporary speaker (Senior Most or oldest) at the beginning of a new Lok Sabha.

Other facts about Parliament–

- New Delhi (NCT) have 70 Vidhan Sabha, 7 Lok Sabha and 3 Rajya Sabha seats.
- 3 session – Budget (Feb to May), Monsoon (July to Aug) and Winter (Nov to Dec)
- Maximum time between two sessions – 6 months. End of Parliament session- Prorogation
- Budget is presented on February 1st every year (Annual Financial Statement)- Article 112.
- Sansad TV (Television) is the Parliamentary channel of India. It was created in 2021 by merging Lok Sabha Television and Rajya Sabha Television
- Largest Lok Sabha constituency (Area wise) – Ladakh.
- Largest Lok Sabha constituency (Population wise) – Malkajgiri (Telangana)
- Smallest Lok Sabha constituency (Area wise) – Chandni Chowk, Delhi
- Smallest Lok Sabha constituency (Population wise) – Lakshadweep.
- **Question Hour** – First hour of a sitting of the Lok Sabha (11 am to 12 noon)
- **Zero Hour** – After question hour, starts at the noon, duration one hour (from 12 noon to 1 pm)

Emergency Provisions– Part-18

- Taken from Germany's Weimer Constitution
- Only President can declare emergency
- **Article 352 – National Emergency**– on the ground of war, external aggression or armed rebellion
- **Article 356 – State Emergency**–on the ground of the failure of Constitutional Machinery or President's rule
- **Article 360 – Financial Emergency**–on the ground of financial stability or the credit of India-
- **Note:** The country so far did not have any Financial Emergency till now

THE JUDICIARY–

SC- Supreme Court (Art-124-147) in Part-V

- Inaugurated on 28th January, 1950 under Government of India Act, 1935.
- Highest Court of India. Supreme Court is established at **New Delhi**.
- Also known as **Guardian (Custodian) of the Constitution** and **Court of Records**.
- Total Judges – 34, (Appointed by President), Originally 7 Judges when Supreme Court established.
- Only Parliament can increase the number of judges in Supreme Court
- Qualifications – **Judge** of two or more High Court at least 5 years/ or **Advocate** at least last 10 years
- Oath– by **President of India**
- Resignation – to **President**
- Salary – 280000 or 2.8 Lacs (for CJI) and 250000 or 2.5 Lacs (for other judges of Supreme Court)
- First Chief Justice of India (CJI) – **Hira Lal J Kania**
- Current 50th CJI – **Dhananjaya Yeshwant (DY) Chandrachud**
- Next CJI in November 2024 – Justice Sanjeev Khanna
- Retirement Age – at the age of **65 years**
- Judicial review powers- to safeguard the citizen's liberties.
- First Woman Judge – **Justice Fathima M. Beevi (6 October 1989 to 29 April 1992)**

HC- High Court (Art. 214- 231) in Part-VI

- First High Court of India – Calcutta High Court at Fort William (1st July, 1862)

- Bombay High Court (14 Aug 1862) and Madras High Court (15 Aug 1862) established with Calcutta HC.
- Allahabad High Court was 4th High Court established in 1866.
- Total high Courts – 25
- The 25th High Court is Andhra Pradesh High Court at Amaravati from 1st January 2019.
- Judges of all High Court appointed by the President.
- Oath– by **Governor of state.**
- Resignation– to **President**
- Retirement age – **62 years.**
- Qualification– **Advocate** of two or more HC at least 10 years/ or at least 10 years held a judicial office
- Salary – 2.5 Lacs (for CJ) and 2.25 Lacs (for other judges of High Court)
- First women judge of any high court– Leila Seth (Delhi High Court)

Jurisdiction and Benches of some High Court –

- Andaman and Nicobar Island, West Bengal are under Calcutta High Court
- Maharashtra, Goa, Dadra and Nagar Haveli, Mumbai, Daman and Diu are under Bombay High Court
- Tamil Nadu and Puducherry under Chennai High Court.
- Punjab, Haryana and Chandigarh under Punjab and Haryana High Court
- Arunachal Pradesh, Assam, Nagaland, Mizoram under Guwahati High Court
- Keralam, Lakshadweep under Keralam High Court
- **Note:** Delhi is the only Union Territory of India which has its own High court
- PIL – **Public Interest Litigation** started in 1980s by **Justice PN Bhagwati**
- PIL is taken from USA jurisprudence.
- Lok Adalat (People's Court) was first setup at Gujarat in 1982

Attorney General of India (Art. - 76) –

- Highest/ First Law officer of Government of India (Appointed by President).
- Current Attorney General of India– R. Venkataramani (First was M.C. Setalvad)
- Can participate in parliament meeting, can't vote.
- Advocate General is for states appointed by the Governor

CAG – Comptroller and Auditor General (Art. - 148) –

- Guardian of the Public Purse.
- Head of the Indian audit & account department and Accountant of the Government.
- Retirement age – 65 years or 6 years, whichever is earlier
- CAG is appointed by President
- Current CAG – Girish Chandra Murmu (1st was V. Narahari Rao)

Governor–

- Role of the Governor is quite similar to President of India
- Constitutional/ Executive Head of the state (Rajya)
- **First person of the state** • Minimum Age – **35 years.**
- Appointed by – **President** • Tenure – **During pleasure of the President (Normally 5 years)**
- Oath – By **chief Justice of High Court**
- Official Residence of Governor – **Raj Bhawan**

Chief Minister–

- Head of the state government. • Appointed by – **Governor**
- Oath – **By Governor** • Minimum age – **25 years**
- Tenure – **Till Assembly** • Chief Minister is **Chairman of State Planning Board.**
- Member of the **Inter-State Council** and the **Governing Council of NITI Aayog** (Both headed by PM)
- First female Chief Minister of any state – **Sucheta Kriplani (Uttar Pradesh)**

Legislative Assembly (Vidhan Sabha)–

- State Legislature or assembly
- Members are elected by people (public) in direct election on the basis of **Universal Adult Suffrage**
- Maximum strength (Not exceed than) – **500**, Minimum strength (Not Less than) – **60**

- Largest Assembly – Uttar Pradesh (403) followed by West Bengal (294), Maharashtra (288)
- **New Delhi, Jammu and Kashmir, Puducherry** are UTs with Assembly.
- Minimum age for members of Legislative Assembly – **25 years.**

Legislative Council (Vidhan Parishad)–

- Upper house of state
- Only in 6 states have Legislative council (Bicameral Legislature) –Uttar Pradesh, Bihar, Maharashtra, Karnataka, Andhra Pradesh and Telangana (similar like Rajya Sabha at the Union level)
- Minimum age for members of Legislative Council – **30 years.**
- Maximum strength – 1/3 of total Assembly
- Minimum strength – 40

Panchayati Raj Institution (PRI) –

- Third level of the Government after Union and State Government
- Rural local self-government in India
- **Lord Ripon** is known as the father of local self-government
- First Panchayat Introduced on – 2 Oct. 1959 at Nagaur (Rajasthan) by PM JL Nehru.
- Three tier system recommendation by – Balwant Rai Mehta Committee (1957)
- Father of Panchayati Raj Institutions (PRI) – Balwant Rai Mehta
- 73rd Amendment Act, 1992 – 24 April 1993, Panchayati Raj became constitutional
- Panchayati Raj Day is celebrated on **24 April** every year.
- Prime Minister when Panchayati Raj became constitutional – **P V Narasimha Rao**
- President when Panchayati Raj became constitutional – **Shankar Dayal Sharma**
- Minimum age for Panchayat Election – **21 years**
- Tenure of Panchayat– Normally **5 Years**
- State Election Commission is responsible for Panchayat Election.
- **Part– 9, Schedule– 11, Article– 243 ‘A’ to 243 ‘O’** in Indian Constitution related with Panchayati Raj
- No Panchayats in – Nagaland, Mizoram and Meghalaya and all UTs except Delhi.
- Three tier system– Gram Panchayat (at Village level), Mandal Parishad or Block Samiti or Panchayat Samiti (at Block level), and Zila Parishad or Zila Panchayat (at District level).
- Head of Gram Panchayat is Mukhiya or Sarpanch or Pradhan (Tenure- 5 years)
- Gram Sabha is known as group of some villages.
- West Bengal is only state where **Four Tier** System.

Municipalities–

- Urban local self-government in India
- First Nagar Nigam in India– Madras (1688) followed by Bombay and Kolkata (1726)
- 74th Amendment Act, 1992
- 74th Amendment Act was came into force on 1st June 1993
- **Part– 9-A, Schedule– 12, Article– 243 ‘P’ to 243 ‘ZG’** in Indian Constitution related with Municipalities
- Municipalities are divided into **Wards**
- Nagar Panchayat or Palika (Committee)
- Nagar Parishad (Municipal Council)
- Nagar Nigam (Municipal Corporation)
- Head of Municipal Corporation or first person of city – Mayor (Mahapaur)

Elections Commission of India (ECI)–

- ECI was Constitution on 25th January, 1950
- Election Commission of India is appointed by President of India
- Retirement age – 65 years or 6 years, whichever is earlier
- Election commissioners –2 (Members)+ 1 (CEC)= Total–3 from 1989
- First chief election commissioner (CEC) – Sukumar Sen.
- Current CEC – Rajiv Kumar
- EVM (Electronic Voting Machine) – first used in May 1982 at Parur (Paravur), Keralam

- The 2004 Lok Sabha election was conducted entirely on EVMs
- In 1989 the voting age reduced from 21 to 18 in India (61th Constitutional Amendment, 1988)
- VVPAT is an independent verification printer machine and is attached with EVM.
- VVPAT full form– Voter-Verifiable Paper Audit Trail
- VVPAT first time used in India at Noksen Assamby Elections at Nagaland in 2013.
- Election commission is the highest body for elections and Party politics in India.
- President, Vice-President, Rajya Sabha, Lok Sabha and the state Legislative Assemblies elections are conducted by Election Commission of India.
- **Note:** State Election Commission is appointed by Governor.
- Total National Political Parties in India – 6



- National Political Parties (From Left to Right) – Indian National Congress (INC), Bhartiya Janata Party (BJP), Communist Party of India (CPI-Marxist), Bahujan Samaj Party (BSP), Aam Aadmi Party (AAP) and National People's Party (NPP).
- Indian National Congress (INC) is oldest political party (1885) and Aam Aadmi Party is newest (2023).

Language–

- Article-343-351, Part-17 and Schedule 8 of Indian Constitution deals with languages.
- Total languages – **22**
- When Constitution of India was formed there was **14 Languages–**
 - **Hindi, Sanskrit, Urdu, Kashmiri, Punjabi, Gujarati, Marathi, Tamil, Telugu, Kannada, Malayalam, Odia, Assamese and Bengali**
 - **Sindhi** was added in 1967 (21th Constitutional Amendment)
 - **Manipuri, Konkani and Nepali** were added in 1992 (71th Constitutional Amendment)
 - **Bodo, Maithili, Dogri and Santali** were added in 2003-04 (92th Constitutional Amendment)
- Hindi adopted on **14 September 1949** as national language of India.
- National Hindi Day – **14 September** and **World Hindi Day – 10 January** is celebrated every year.
- Apart this there are '**Seven' Classical Languages –**
 - **Tamil** (Declared in 2004)
 - **Kannada** (2008)
 - **Malayalam** (2013)
 - **Farsi (Persian)** (2024)
 - **Sanskrit** (2005)
 - **Telugu** (2008)
 - **Odia** (2014)

According to India's National Education Policy-2020 there are Nine classical language. Seven above & Pali and Prakrit

Finance Commission–

- Article -280 related with Finance Commission
- Total 5 Members (1 Chairman + 4 Members), all appointed by President of India
- Finance Commission appointed every 5 years by President of India.
- 1st Finance Commission – KC Neogi
- 16th Finance Commission headed by Arvind Panagariya.
- State Finance Commission is appointed by Governor

Union Public Service Commission (UPSC)–

- Earlier known as Indian Civil Service (ICS), from 26 January 1950 ICS known as UPSC
- Established on 1 October 1926. Headquarter is located at Dholpur House (New Delhi).
- Satyendra Nath Tagore (Brother of Rabinder Nath Tagore) 1st person who crack the ICS Exam in 1864
- Chairman and Members are appointed and removed only by the President of India
- Terms of Office – 65 years or 6 years, whichever is earlier
- UPSC conduct IAS, IPS, IFS, IFoS and NDA Exams along with 24 Services.

National Institution for Transforming India (NITI) Aayog–

- Earlier known as Planning Commission. Planning Commission First Headed by – Jawaharlal Nehru
- Planning Commission established on 15 March 1950. Planning Commission replaced by NITI Aayog.
- NITI Aayog established on 1st January 2015.
- NITI Aayog First Headed by – Narendra Modi
- Think tank of India. NITI Aayog is not a constitutional body. It is an executive body
- Chairperson of NITI Aayog is Prime Minister. Vice Chairperson is appointed by PM
- Current Vice Chairperson of NITI Aayog – Suman Berry (from 1 May 2022)
- Current CEO of NITI Aayog – B.V.R. Subrahmanyam (from 25 February 2023)

GST Council–

- Goods and service Tax – 101st Amendment Act – 2017.
- Head of GST Council – Finance Minister
- Current Finance Minister – Nirmala Sitaraman

Important Constitution Amendments –

- Article 368 of Indian Constitution is related with Constitutional Amendments
- Only Parliament can amend the Constitution. Amend can be started any house of parliament.
- First Constitution Amendment – 1951
- **42nd Constitution Amendment, 1976** is known as **MINI CONSTITUTION**. **Preamble** was amended
- 44th Constitution Amendment, 1978 – Right to Property was removed from Fundamental Rights.
- 52th Constitution Amendment, 1985 – Anti Defection Law (Schedule 10) was passed.
- 73rd and 74th Constitution Amendment, 1992 – Panchayats and Municipalities become Constitutional
- 86th Constitution Amendment, 2002 – Free and Compulsory education for 6-14 years children (Art- 21A)
- 69th Constitution Amendment, 1991 – Delhi changes at NCT- National Capital Territory
- 101th Constitution Amendment, 2016 – Goods and Service Tax (GST)

Important Parts of Indian Constitution–

- | | |
|------------------------------------|--|
| • Part- 1– Union and Its Territory | • Part- 2– Citizenship |
| • Part- 3– Fundamental Rights | • Part- 4– Directive Principles of State Policy (DPSP) |
| • Part- 4A– Fundamental Duties | • Part- 9– Panchayats |
| • Part- 9A– The Municipalities | • Part- 10– Schedule and Schedule Tribe |
| • Part- 15– Election Commission | • Part- 17– Official Language |
| • Part- 18– Emergency Provisions | • Part- 20– Amendment in Indian Constitution |

Important Schedules of Indian Constitution–

- | | |
|--|---|
| • Schedule- 1– States and UTs | • Schedule- 2– Salaries |
| • Schedule- 3– Oath | • Schedule- 5– Schedule Areas and Schedule Tribes |
| • Schedule- 7– Distribution of Powers (Union List, State List and Concurrent List) | • Schedule- 10– Anti Defection Law |
| • Schedule- 8– Languages | • Schedule- 12– Municipalities |
| • Schedule- 11– Panchayats | |

Other Information Facts

- Representative of the government at Panchayat level – Panchayat Secretary or Gram Sachiv
- Who is the Executive Officer of the Panchayat Samiti at Block level – Block Development Officer (BDO)
- Several Block is known as Sub-Division. Head of Sub-Division is – Sub-Divisional Officer (SDO)
- Several Sub-Division is known as District. Head of District – District Magistrate (DM) or Deputy Commissioner (DC).
- Smallest unit of police department in state is known as Police Station. Incharge is Inspector
- Police chief of a District is known as Superintendent of Police (SP)
- Police chief in Commissionary is known as Inspector General of Police (IG or IGP)
- Police chief of a state is known as Director General of Police (DGP)
- Article 370 and Ar. 35-A related with Jammu and Kashmir. Two new UTs were formed in 2019 after disintegration- Jammu & Kashmir (legislative assembly) and Ladakh (under lieutenant governor). Governor that time- Satya Pal Malik.

COMPUTER

- Earlier known tool for computation or Earlier Computer was – **Abacus** (developed by China in 16th century)
- First Mechanical Calculator – Blaise Pascal in 1642
- Father of computer – **Charles Babbage**. Father of Modern Computer – **Alan Turing**
- The only language that is understood by the computer is the Machine Level Language (Binary Language)
- World's first Electronic Computer – ENIAC (1946) by John Adam Presper Eckert and John Mauchly.
- Computer Literacy Day – 2 December every year from 2001.
- First computer in India – **TIFRAC** (Tata Institute of Fundamental Research Automatic Calculator), 1969
- First Computer developed in India – **Siddharth (1986) Bengaluru**.
- First Super Computer of India – **Param**. Param was Developed by CDAC, Pune.
- Speed of Supercomputer is measured in FLOPS (floating point operations per second)
- **Bug** – A coding error in a computer program is known as Bug.
- **Antivirus** – Software using in computer to prevent from malware, trojan and virus.
- World first computer virus was Creeper Virus, was created in 1971 by Robert Thomas.
- Speed of Computer is measured in GHz (Gigahertz)
- Central Processing Unit (CPU) is called the Brain of Computer
- The CPU is constructed on a single integrated circuit called a **microprocessor**.
- **Input Device**: Keyboard, Mouse, Bar code reader, Trackball, Scanner, OMR, Joystick etc.
- **Output Device**: Monitor, LCD, LED, Printer, Plotter, Headphone, Projector etc.

Generation of Computer–

- 1st 1940-56- Very big size, called Vacuum Tubes. (Ex- ENIAC, EVAC, UNIVAC etc.)
- 2nd 1956-63- Transistor Technology instead of Vacuum Tubes (Ex- IBM 1920, IBM 7094, CDC 3600 etc.)
- 3rd 1964-71- Integrated Chips (IC) introduced. Size also reduced. (Ex- CDC 1700, IBM 360)
- 4th 1971- to present- Very Large Scale Integrated (VLSI) Circuits or simply microprocessors (Ex-Apple, HP)
- 5th Present and Beyond- Based on Artificial Intelligence (AI). Father of AI – John McCarthy

Operating Systems (OS) – Linux, Windows, Mac or iOS, Ubuntu DOS etc.

Programming Languages – JAVA, Pascal, Fortran, C++, JavaScript, Python, COBOL etc.

- Ada Lovelace and Charles Babbage Invent the first computer language in 1883
- Programming languages Python, C++, Java, MATLAB, Fortran are used for difficult scientific calculations.

Computer Browsers – Safari, Chrome, Opera, Mozilla Firefox, UC Browser, TOR Browsers, Microsoft Edge, Netscape

Search Engines – Google, Bing, Yahoo, DuckDuckGo, Yandex, AOL, ask.com etc.

Domains – .com, .edu, .gov, .mil, .net, .org are famous domains.

Note: India's 1st Operating System is – **BharOS (Bharat OS)**. India's first defence operating system is – **MayaOS**

Super Computers–

1st super computer of World – CDC 6600 by SEYMOUR CRAY (USA)

1st super computer of India – PARAM 8000 by Vijay Pandurang Bhatkar (father of super computer in India)

Currently top 3 Super Computer of the World is – Frontier (USA), Fugaku (Japan), Lumi (Finland)

Currently top 3 Super Computer of India – PARAMSIDDHI, Pratyush, Mihir (all made by CDAC, Pune)

Computer memorable facts

- Windows Operating System is owned by Microsoft (Bill Gates). Windows XP, Windows 7, 8, 10, 11 famous OS.
- Apple company OS name is iOS. (Note: APPLE and Microsoft both USA company).
- Edge Browser introduced by Microsoft instead of Internet Explorer (15 June 2022).
- Safari browser is developed by Apple. Facebook is founded by Mark Zuckerberg.
- RAM, DRAM, SRAM, ROM, PROM, EPROM, EEPROM and MROM are known as Primary Memory in Computer.
- HDD, SSD, Cloud Storage, USB Pen Drive, Floppy Disk, SD Cards, CD are known as Secondary Memory in Computer.
- 1G, 2G, 3G, 4G, 5G is network generation in Mobile Network. **G = Generation**

- Android is mobile OS which was develop by Google.
- 2D, 3D, 4D etc. are view of presenting in a video. **D= Dimension**
- .MOV extension file extension refers to Animation or movie file in the field of computer.
- E-Mail, E-Waste, E-Computing, E-Book word are related with electronic equipment's. **E= Electronic**
- Internet is a source of information on any topic. Sundar Pichai is associated with Google and Alphabet Inc.
- Internet invented by Vint Cerf World Wide Web invented by Tim Berns Lee
- E-mail invented by Ray Tomlinson Mouse invented by Douglas Engelbart
- Mobile Phone invented by Martin Cooper Computer chip invented by Kilby
- Amazon.com founder is Jeff Bezos
- Father of Artificial Intelligence – John McCarthy Co-founder of Twitter- Biz Stone, Evan Williams and Jack Dorsey
- +1 is area code of USA. Area code of India is +91. Pakistan is +92. India's toll-free number started from 1-800.
- BSNL is a govt. company provides telephones lines and SIM to customers in India, but it is not selling mobile phones.
- Google was founded by Larry Page, Sergey Brin on 4 September 1998, Menlo Park, California, United States
- Pascal is SI Unit of Pressure as well as a computer language.
- The founder of Paytm is Vijay Shekhar Sharma.
- YouTube small size video is called Shorts, Instagram videos is called Reels and Facebook videos is called Watch.
- Dubai is now the first city in the world to have its own "Dubai Font." It was created by Microsoft.

1 Bit	Binary Digit
4 Bit	1 Nibble
8 Bit	1 byte
16 Bit	1 Word
1024 Byte	1 kilo Byte (KB)
1024 KB	1 Mega byte (MB)
1024 MB	1 Giga byte (GB)
1024 GB	1 Tera byte (TB)
1024 TB	1 Peta byte (PB)
1024 PB	1 Exa byte (EB)
1024 EB	1 Zetta byte (ZB)
1024 ZB	1 Yotta byte (YB)
1024 YB	1 Bronto byte (BB)
1024 BB	1 Geopbyte

Ctrl + A	Select All
Ctrl + C	Copy
Ctrl + X	Cut
Ctrl + V	Paste
Alt + F4	Close Window
Ctrl + Z	Undo
Ctrl + Y	Redo
Ctrl + S	Save
F1	Universal Help
F10	Save As
Ctrl + Alt + Del	Open Task Manager, Reboot

- **HTTP** – Hypertext Transfer Protocol
- **RAM** – Random Access Memory
- **MODEM** – Modulator Demodulator
- **WAN** – Wide Area Network
- **HTML** – Hypertext Markup Language
- **IBM** – International Business Machine
- **USB** – Universal Serial Bus
- **WWW (W3)** – World Wide Web
- **URL** – Uniform Resource Locator
- **Wi-Fi** – Wireless Fidelity
- **GPS** – Global positioning system
- **CD** – Compact Disk
- **DNS** – Domain Name System
- **FTP** – File Transfer Protocol
- **WLAN** – Wireless Local Area Network
- **BHIM** – Bharat Interface for Money
- **HTTPS** – Hypertext Transfer Protocol Secure
- **ROM** – Read Only Memory
- **LAN** – Local Area Network
- **CPU** – Central Processing Unit
- **IC** – Integrated Circuit (made by Kilby)
- **OMR** – Optical Mark Recognition
- **UPS** – Uninterruptible Power Supply
- **WWW (W4)** – World Wide Web Womb
- **PDF** – Portable Document Format
- **Li-Fi** – Light Fidelity
- **BIOS** – Basic Input Output System
- **DVD** – Digital Versatile Disk
- **DTH** – Direct To Home
- **VPN** – Virtual Private Network
- **BSNL** – Bharat Sanchar Nigam Limited
- **KYC** – Know Your Customer

- **GPRS** – General Packet Radio System
- **R&D** – Research and Development
- **VOLTE** – Voice over Long-Term Evolution
- **TRAI** – Telecom Regulatory Authority of India
- **STD** – Subscriber Trunk Dialing
- **PCO** – Public Call Office
- **GPT** – Chat Generative Pre-Trained Transformer (in Chat GPT)
- **C-DAC** – Centre for Development of Advanced Computing
- **HDD** – Hard Disk Drive (old type storage for computer)
- **SSD** – Solid State Drive (very fast storage for computer)
- **CMYK** – Cyan-Magenta-Yellow-Black (color model in computer)
- **GOOGLE** – Global Organization of Oriented Group Language of Earth
- **OTP** – One Time Password
- **QR Codes** – Quick Response Code
- **IFSC** – Indian Financial System Code
- **OTT** – Over The Top
- **ISD** – International Subscriber Dialing
- **IP** – Internet Protocol



Important Dates and Days –

JANUARY

- Jan 04 — Louis Braille Day (Braille Script for Blind People)
- Jan 09 — Pravasi Bhartiya Diwas or NRI Day (Non-Resident Indian)
(Gandhiji Came to India from South Africa in 1915)
- Jan 10 — World Hindi Day (1st time Hindi was spoken in the UN General Assembly in 1949)
- Jan 12 — National Youth Day (Birth Day of Swami Vivekanand-1863-1902)
- Jan 13 — Lohri (Celebrated mainly in Punjab and Northern India)
- Jan 15 — Army Day (Sir Francis Butcher to K M Cariappa in 1949)
- Jan 23 — Parakram Diwas (Netaji Subhash Chandra Bose's birth anniversary) 1897-1945, Cuttack
- Jan 24 — National Girl Child Day, International Day of Education
- Jan 25 — National Voters Day
- Jan 26 — Republic Day
- Jan 30 — Martyr's Day (Mahatma Gandhi shot dead by Nathu Ram Godse) 1948

FEBRUARY

- Feb 02 — World Wetlands Day (Ramsar, Iran in 1971)
- Feb 04 — World Cancer Day
- Feb 13 — National Women's Day (Sarojini Naidu's Birth Anniversary 1879-1949)
- Feb 21 — Mother Tongue Day
- Feb 22 — World Scout Day (Birth Day of Robert Baden Powell)
- Feb 28 — National Science Day (Raman Effect by C V Raman)

MARCH

- March 3— World Wildlife Day
- March 4— National Security Day (Established of National Security Council 1966), National Safety Day (March 4)
- March 8 — International Women Day (from 1977 by UN)
- March 20— International Day of Happiness (World Happiness Day) from 2013 (UNGA)
- March 21— World Forestry Day
- March 22— World Water Day (from 1993 by UN)
- March 23— World Meteorological Day
- March 24— World TB Day (Vaccine Discovered by Robert Koch in 1882)
- March 26— Bangladesh Liberation Day (Independence from Pakistan in 1971)

Note: Earth Hour observed annually on Last Saturday in March from 8:30 pm to 9:30 pm (first started in Sydney, Australia on March 31, 2007). It is also known as Sydney Hour.

APRIL

- April 07— World Health Day
- April 13— Jallianwala Bagh Massacre Day (in 1919 by General Reginald Dyer)
- April 14— Bhim Rao Ambedkar Remembrance Day (1891-1956), World Quantum Day.
- April 18— World Heritage Day
- April 21— The Civil Service Day (1st Batch of Civil Servants address by S. Patel)
- April 22— World Earth Day
- April 23— World Books Day
- April 24— National Panchayati Raj Day (Panchayat became Constitutional 1993)

MAY

- May 01— May Day or International Labour (Workers) Day (8 Hours Work in USA 1886)
- May 04— World Press Freedom Day
- May 08— International Red Cross Day (Birth Day of Henry Dunant 1828-1910)
- May 11— National Technology Day (Operation Shakti in 1998)
- May 21— Anti Terrorism Day
- May 22— World Biodiversity Day

May 31— World No Tobacco Day

Note: "Mother's Day" is celebrated on the 2nd Sunday of May at USA from 1914.

JUNE

June 01— World Milk Day

June 05— World Environment Day

June 08— Ocean's Day

June 21— International Yoga Day/ Music Day

June 23— Olympic Day

June 25—Samvidhan Hatya Diwas

Note: "Father's Day" is celebrated on the 3rd Sunday of June at USA from 1910.

JULY

July 01— Doctors Day (Bidhan Chandra Roy)

July 04— American Independence Day (from Britain in 1776)

July 11— World Population Day

July 15— National Cadet Corps formation Day-NCC (1948)

Note: — NCC day is celebrated on 4th Sunday of November Every Year because 1st Unit raised to Delhi in 1947,

Motto— UNITY AND DISCIPLINE

July 18— Nelson Mandela Day

July 26— Kargil Victory Day (from Pakistan in 1999)

July 29— Tiger's Day

AUGUST

August 06— Hiroshima Day

August 08 —Quit India Movement Day

August 10 —World Lion Day

August 12— International Youth Day

August 14— Pakistan Independence Day

August 15— India's Independence Day

August 19— World Humanitarian (Manavta) Day

August 23— National Space Day (due to Chandrayaan – 3 landed on Moon)

August 29— Sports Day (Birthday of Major Dhyan Chand 1905-1979)

SEPTEMBER

Sept 05— Teacher's Day (Birthday of Dr S Radhakrishnan 1888-1975)

Sept 08— International Literacy Day

Sept 14— Hindi Day (Accepted official language of India in 1949)

Sept 15— Engineers Day (Mokshagundam Visvesvaraya Birth Day)

Sept 16— World Ozone Day (Montreal Protocol 1987)

Sept 21— International Day of Peace or World Peace Day

Sept 29— World Heart Day

OCTOBER

Oct 02—International Day of Non-violence (Birth Day of Mahatma Gandhi 1869-1948)

Oct 04— World Animal Day

Oct 05— World Teachers Day, World Habitat Day

Oct 08— Indian Air force Day (Indian Air Force was founded in 1932)

Oct 11— International Girl Child Day

Oct 15— Student's Day (Birth Day of APJ Abdul Kalam 1931-2015)

Oct 16— World Food Day

Oct 24— World Polio Day (Jonas Salk), United Nations Day (1945)

Oct 31— National Integration Day (Unity Day or Ekta Diwas)- Sardar Patel 1875-1950

NOVEMBER

Nov 11— Education Day (Birthday of Abul Kalam Azad 1888-1958, First Education Minister of India)

Nov 14— Children's Day (Birthday of J L Nehru 1889-1964), World Diabetes Day
Nov 26— National Constitution Day, National Milk Day (Birth Day of Dr. Varghese Kurien-1921-2012, White Revolution)

DECEMBER

Dec 01— World Aids Day (NACO- National AIDS Control Organization)- Red Ribbon is logo of NACO.
Dec 04— Navy Day
Dec 07— Armed Forces Flag Day
Dec 10— Human Rights Day
Dec 11— UNICEF Day
Dec 16— Vijay Diwas (India defeat Pakistan in 1971)
Dec 22— National Mathematics Day (Srinivasa Ramanujan 1887-1920 at Erode, TN)
Dec 23— Kisan Diwas or Farmer's Day (Birthday of 5th Prime Minister Ch. Charan Singh)
Dec 25— Good Governance Day (Birthday of Atal Bihari Vajpayee 1924-2018)

Data of Sports and Games –

Summer Olympics – (Total Members- 206 Countries)

- ❖ Ancient Olympics — 776 BC (Olympia, Greece)
- ❖ Modern Olympics — 1896 AD (Athens, Greece)
- ❖ Father of Olympics— Baron Pierre De Coubertin, France (1863-1937)
- ❖ Olympic Day — 23 June (Found the International Olympic Committee in 1894)
- ❖ Headquarters— Lausanne, Switzerland (IOC)
- ❖ Olympic Symbol— Five Rings - Black (Africa), Red (North and South America), Yellow (Asia), Green (Australia), Blue (Europe), White (Antarctica or Peace)
- ❖ Olympic Flag— 1st Hosted in 1920- Antwerp, Belgium
- ❖ Olympic Torch— 1st Hosted in 1928- Amsterdam, Netherlands
- ❖ First Winter Olympics — 1924 Chamonix, France
- ❖ First Paralympic — Rome in 1960.
- ❖ Mascot was 1st introduced in Olympic in 1972 (Munich, Germany), named- Waldi (Dog)
- ❖ 2024 Paris Olympic Mascot is "The Phryges" (Traditional Hat in Paris)
- ❖ Olympic Motto — Citius, Altius, Fortius (Swifter, Higher and Stronger), Latin Word
- ❖ Most Olympic Medals — Michael Phelps (Total-28) (Swimming), USA
- ❖ 2021 Olympic Games — Tokyo (Japan)- India 48th Rank (T7-4B-2S-1G)
- ❖ 2024 Olympic Games — Paris (France)
- ❖ 2028 Olympic Games— Los Angeles (USA)
- ❖ 2032 Olympic Games— Brisbane (Australia)
- ❖ **Note:** Due to World War in 1916, 1940 & 1944 were scheduled but cancelled.
- ❖ USA has the maximum Olympic medals—2633 medals with 1061 Gold (before Paris Olympic of 2024)

India in Olympics –

- ❖ Norman Gilbert Pritchard— First Participant and Medallist-1900 in Paris (France)
- ❖ First Hockey Gold – 1928 Amsterdam (Netherlands)
- ❖ First Individual medal — KD Jadhav (Wrestling)-1952, Helsinki (Finland)
- ❖ First Woman Medalist— Karnam Malleshwari (Weight Lifting)-2000, Sydney
- ❖ First individual Gold — Abhinav Bindra (Shooting)-2008
- ❖ First to win two medals in different Olympics — Sushil Kumar-2008 & 2012
- ❖ First woman to win two medals in different Olympics — PV Sindhu 2016 & 2021
- ❖ First Track and Field (Athletics) Gold Medal— Neeraj Chopra (Javelin Throw) in Tokyo Olympic 2021
- ❖ India has total 35 Olympic Medals — 10 Gold, 9 Silver and 16 Bronze.

Commonwealth Games (CWG) —(Total Members- 72 Countries)

- ❖ First Commonwealth Games — 1930, Hamilton, Canada
- ❖ India host the CWG in 2010 at New Delhi (19th Edition). Mascot- Shera (A Tiger)
- ❖ 2022 (22th Edition) Commonwealth Games — Birmingham, United Kingdom / Mascot- Perry, The Bull

- ❖ 2026 CWG— Victoria (Australia)
- ❖ 2030 CWG—Hamilton, Canada
- ❖ Mascot was first introduced in 1978 at Canada. Mascot- Keyano (A Brown Bear)
- ❖ First Indian to win Medal — Rashid Anwar (Wrestling), London-1934
- ❖ First Indian to win CWG Gold medal — Milkha Singh (Athlete), Cardiff (Wales, UK)-1958
- ❖ First Indian Woman to win CWG Gold medal—Roopa Unnikrishnan (Shooting), 1998, Malaysia

Asian Games — (Also Known as Asiad Games)- Members- 45 Countries

- ❖ First Asian Games — 1951, New Delhi (India got 2nd Position, 1st - Japan)
- ❖ 2022 Asian Games — Hangzhou, China (23 September to 8 October 2023)
- ❖ 2026 Asian Games — Aichi-Nagoya, Japan
- ❖ 2030 Asian Games — Doha, Qatar
- ❖ India hosted Asian Games Two Times- 1951 and 1982.
- ❖ In 1982 First Asian Games to introduce a mascot, Appu (an Elephant).
- ❖ First Indian Man to Win Asian Gold— Sachin Nag (Swimming)- New Delhi, 1951
- ❖ First Woman to Win Asian Gold— Kamaljeet Sandhu (Racing)- Bangkok, 1970

Football or Soccer —

- ❖ Most popular sports of the World. Ground size 105 m long and 80 m wide.
- ❖ Origin Country of football is England.
- ❖ First Football World Cup — 1930, Uruguay (Winner- Uruguay)
- ❖ First Female Football World Cup — 1991, China (Winner- USA)
- ❖ Most Football World Cups won by — Brazil (5)
- ❖ Most Goals in FIFA world cup—Miroslav Klose-16 Goals (Germany), 2nd Ronaldo 15 (Portuguese)
- ❖ Most Goals by an Indian— Sunil Chetri (Secunderabad, Telangana)- 172 Goals
- ❖ Football Highest Authority — Federation Internationale de Football Association (**FIFA**)
- ❖ Father of FIFA — Jules Rimet, 1st Chairman of FIFA: Robert Guerin
- ❖ Name of the FIFA World Cup — Jules Rimet Trophy
- ❖ FIFA Head Quarter— Zurich, Switzerland
- ❖ 2022 Football World Cup — Qatar (Winner- Argentina, Runner up- France)
- ❖ 2026 Football World Cup — USA, Canada and Mexico Jointly
- ❖ Lionel Messi (Argentina), Cristiano Ronaldo (Portuguese), Neymar Da Silva (Brazil), David Beckham (England), Kylian Mbappé (France), Karim Benzema (France), Diego Maradona (Argentina) Edson Arantes Pelé (Brazil), Zinedine Zidane (France) are famous players of football.
- ❖ Sunil Chhetri and Baichung Bhutia are famous footballer from India.
- ❖ **Note:** Pele (Brazil) is considered as the God of Football
- ❖ First football club of India was Kolkata FC (1872), 2nd Kochi FC.
- ❖ Mohun Bagan Athletic Club is the oldest existing football club in India (from 1889).
- ❖ Nagendra Prasad Sarbadhakari known as the Father of Indian Football.

Cricket— (Founder Country- England)

- ❖ First Test Match (5 Days match) — Australia vs England (1877, Melbourne)
- ❖ First One Day International (ODI) Match (50 over match) — Australia vs England (5 January 1971)
- ❖ First T-20 Match (20 over match) — New Zealand vs Australia (2005)
- ❖ First IPL— 2008, Winner- Rajasthan Royals
- ❖ Highest Run Scorer in cricket history— Sachin Ramesh Tendulkar (India) [ODI 18426 and test 15921 runs]
- ❖ First man to score 200 (double century) in ODI— Sachin Tendulkar
- ❖ First women to score 200 (double century) in ODI— Belinda Clark (Australia), 2nd is Amelia Kerr (New Zealand)
- ❖ Currently 14 persons (included two womens) score 200+ runs (double century) in ODI cricket. Rohit Sharma remains the only cricketer to hit three ODI double hundreds
- ❖ Highest Wicket Taker in cricket history — Muttiah Muralitharan (Sri Lanka) [ODI 534 and test 800 wickets]
- ❖ Anil Kumble is the highest wicket-taker for India in ODI (334) and Test (619) both.
- ❖ First pacer (faster) took 600+ wickets in test cricket — Jimmy or James Anderson (England) [Total 704 in test]

- ❖ Highest Test Score at single time— Brian Lara (400* Runs, West Indies)
- ❖ Highest One Day Score in single match— Rohit Sharma (264)
- ❖ First Cricket World Cup — 1975, England (Winner - West Indies)
- ❖ Most Cricket World Cups won by — Australia (6)
- ❖ 2023 World Cup hosted by India and winner of 2023 World Cup was Australia.
- ❖ 2027 World Cup— South Africa, Zimbabwe and Namibia Jointly
- ❖ First T20 World Cup - 2007 (Winner- India, Runner up- Pakistan)
- ❖ India won two ODI World Cup in 1983 (Kapil Dev) and in 2011 (M S Dhoni)
- ❖ India also won two T20 World Cup in 2007 and 2024.
- ❖ First Indian Test Captain — C K Nayudu (1932)
- ❖ First Indian one day captain—Ajit Wadekar (1974)
- ❖ Currently Indian Cricket Team Captain (Male)— Rohit Sharma
- ❖ Currently Indian Cricket Team Captain (Female) — Harmanpreet Kaur
- ❖ International Cricket Council (ICC) HQ - Dubai; Board of Control for Cricket in India (BCCI) HQ - Mumbai
- ❖ 1st Female Cricket World Cup—England 1973 (Winner- England)
- ❖ Position of Umpire supposed to be present in Square Leg.
- ❖ In cricket yo-yo test measure the Fitness Level of players
- ❖ Prudential, Benson & Hedges Cup, CK Nayadu Trophy are related to Cricket.
- ❖ Wisden Cricketers Almanack or Wisden magazine is known as Bible of Cricket (publish in England)
- ❖ The Ashes is Test Cricket Series between England and Australia
- ❖ Australian team (Kangaroo), New Zealand (Kiwi), South Africa (Chokers), West Indies (Caribbean or Windies), India (Men in Blue) is famous name of cricket teams.
- ❖ **Note:** Sachin Tendulkar is known as God of Cricket.

Hockey—

- ❖ International Hockey Federation (1924) HQ— Lausanne, Switzerland
- ❖ India won 8 Gold medals in Hockey at Olympics.
- ❖ First Hockey World Cup — 1971 at Barcelona (Spain), (Winner- Pakistan)
- ❖ India won Hockey World Cup - 1975
- ❖ 2026 Hockey World Cup will be host by— Belgium and Netherlands (jointly)
- ❖ Currently Indian Hockey Team Captain (Male)— Defender Harmanpreet Singh
- ❖ Currently Indian Hockey Team Captain (Female) — Savita Punia
- ❖ Major Dhyani Chand, Balbir Singh Senior, Mohammad Shahid, Dhanraj Pillay, PR Sreejesh, Vandana Kataria, Savita Punia, Rani Rampal, Deep Grace Ekka, Ritu Rani famous hockey players of all times.

Tennis —

- ❖ International Tennis Federation (1913) HQ— London, England
- ❖ Australian Open (1905) - January- Melbourne- Hard Court
- ❖ French Open (1891) (Roland Garros trophy) - May - Paris- Clay Court
- ❖ Wimbledon Open (1877) — July - London - Grass Court
- ❖ US Open (1881) — September- New York - Hard Court or Deco Turf
- ❖ Oldest Grand Slam (Tennis Tournament) — Wimbledon (1877)
- ❖ **Trick: Wo Use Fodkar Aaya**
- ❖ Most Grand slam —Novak Djokovic, Serbia (24 Slams)
- ❖ First Indian to win Grand Slam — Mahesh Bhupathi in 1997 (French Open)
- ❖ Most Grand slam by an Indian — Leander Paes (14)
- ❖ ATP — Association of Tennis Professionals (Association for Men)
- ❖ WTA — Women's Tennis Association (Association for Women)
- ❖ Novak Djokovic (Serbia), Roger Federer (Switzerland), Rafael Nadal (Spain), Andre Agassi (USA), Serena Williams and Venus Williams (William Sisters) USA, Maria Sharapova (Russia), Martina Hingis (Switzerland), Andy Murray (Britain), Naomi Osaka (Japan), Daniil Medvedev (Russia) are famous Tennis players in the world.
- ❖ Sania Mirza, Leander Paes, Mahesh Bhupathi, Rohan Bopanna, Vijay and Anand Amritraj, Somdev Devvarman,

Yuki Bhambhani are famous Indian tennis players

Games Originated in India —

- ❖ Polo was originated in Manipur.
- ❖ Kabaddi was originated in Tamil Nadu
- ❖ Badminton was originated in Poona, Maharashtra
- ❖ Ludo was famous in the time period (Era) Akbar.
- ❖ Apart from that Snake & Ladder, Chess, Martial Arts (Judo & Karate), Pachisi or Ludo (Board Game in Mahabharata), Kho-Kho, Playing Cards or Taash (Rummy, Bluff and Bridge), Archery was also originated in India.

Other Sports Information —

- ❖ Sports Authority of India Headquarters is located at Jawaharlal Nehru Stadium Complex, New Delhi
- ❖ FIDE (Federation International des Echecs) is related to chess.
- ❖ Official Distance for Marathon— **42.195 KM (26.2 Miles)**. It is also known as Cross Country Race. Half Marathon— **21.0975 KM (13.10 Miles)**
- ❖ Summer and Winter Olympics, Paralympics, ICC Cricket WC, Hockey WC, FIFA Football WC, CWG, Asian Games, National Youth Games etc. comes every **Four Years**
- ❖ Tour de France is related to Cycling.
- ❖ Table Tennis is also known as Ping-Pong.
- ❖ First Indian Chess Grandmaster was Viswanathan Anand (1988).
- ❖ First Female Grandmaster of India- Koneru Humpy (Andhra Pradesh) in 2002
- ❖ American Cup, Monsoon Cup is related to Yacht Racing
- ❖ Corbillion and Corbitton Cup, Swaythling Cup, Ramanujam Cup related to Table Tennis
- ❖ Lord Derby Cup related to Rugby League Football
- ❖ U. Thant Cup related to Lawn Tennis
- ❖ NBA Trophy and William Jones Cup related to Basketball
- ❖ Nehru Trophy is related to Boat Race (Punnamada Lake in Keralam)
- ❖ Nizam Gold Cup, Grand National Trophy (UK) related to Horse Racing
- ❖ Charminar Trophy related to Athletics.
- ❖ Burdwan Trophy is related to Weight- Lifting.
- ❖ King's Cup and Schneider Cup Related with Air Racing.
- ❖ ISSF Cup, Welsh Grand Prix Trophy related to Shooting.
- ❖ A sport where people use a board with small wheels is Skate boarding.

Number of Players in Different Sports (in each side) —

- | | | | |
|--------------------------------------|-------------|--------------------------------|--------------------------|
| • Cricket, Football (Soccer), Hockey | — 11 | • Volleyball, Ice Hockey | — 6 |
| • Rugby, Rugby Football | — 15 | • Polo, Bridge (Playing Cards) | — 4 |
| • Baseball | — 9 | • Kho-Kho | — 12 (9 on Field) |
| • Basketball | — 5 | • Kabaddi, Handball, Netball | — 7 |

Playing Areas of Different Sports —

- | | | |
|--|--|--|
| • Pitch — Cricket and Rugby | • Track — Athletics | • Velodrome — Cycling |
| • Field — Polo, Hockey, Football | • Pool — Swimming | • Arena, Ring — Wrestling |
| • Arena — Horse Riding | • Alley, Belle — Bowling | • Mat — Judo & Karate, Tiquando |
| • Diamond — Baseball | • Ring — Boxing, Skating | • Rink — Ice skating and Ice Hockey |
| • Course — Golf | • Board — Table Tennis | • Range — Shooting, Archery |
| • Circuit — Formula-1 (F1) Racing | • Court — Badminton, Tennis, Handball, Netball, Kho-Kho, Volleyball, Squash | |

Important Cups and Trophies —

Sports	Cups and Trophies
Cricket	Irani, Duleep, Ranji, Cooch Behar, Ashes, Syed Mushtaq Ali, Vijay Hazare Trophy, Rothman's Cup, Asia Cup

<u>Football</u>	Santosh Trophy, Subroto Mukharjee Cup, FIFA World Cup, Durand Cup, Rovers Cup, Vittal Trophy, Nixan Gold Cup
<u>Hockey</u>	Agha Khan Cup, Sultan Azlan Shah Cup, Beighton Cup, Rangaswami Cup, Murugappa Gold Cup, Rene Frank Trophy
<u>Badminton</u>	Syed Modi Cup, Thomas Cup, Uber Cup, Sudirman Cup, Tunku-Abdul Rehman Cup (Asian Badminton), Yonex Cup
<u>Tennis</u>	Grand Slams, Davis Cup, Hopman Cup, Federation Cup, Billi Jean King Cup or Fed Cup (Women Tennis)
<u>Golf</u>	PGA Tours, Ryder Cup, Walker Cup, Eisenhower Cup, Solheim Cup (Women Golf), Hero India Open Tournament
<u>Bridge</u>	Ruia Trophy, Holker Trophy
<u>Polo</u>	Ezra Cup, Radhamohan Cup, Prithi Singh Cup

Important Sports Terms—

<u>Sports</u>	<u>Sports Terms</u>
<u>Badminton</u>	Love, Rally, Smash, Bird, Flick, Let, Kill, Fore-Hand, Shuttle Cock
<u>Boxing</u>	Knockout, Punch, Upper Cut, Jab, Hooke, Bleeder
<u>Baseball</u>	Homerun, Pitcher, Pinching, Diamond, Put Out, Bunting
<u>Cricket</u>	Yo-Yo Test, Duck, Googly, Doosra, Cover Drive, Toss, Wicket, Wide Ball, No Ball
<u>Chess</u>	Gambit, Cassel, Promotion, Grandmaster, Checkmate
<u>Football</u>	Banana Kick, Penalty Kick, offside, Dribble, Baseline, Back Hill, Red Card, Rebound
<u>Golf</u>	Berdie, Bogie, Caddy, Tee, Stymie, Hole, Links, Dogleg, Dub
<u>Hockey</u>	Penalty Corner, Astroturf, Short Corner, Under Cutting, Scoop, Stick, Striking Circle
<u>Swimming</u>	Backstroke, Butterfly, Breast Stroke, Lane, Pool, Crawl
<u>Shooting</u>	Bull's Eye, Rapid-fire, Pistol, Range, Scope
<u>Tennis</u>	Deuce, Net Play, Baseline, Court
<u>Weightlifting</u>	Snatch, Jerk
<u>Wrestling</u>	Heave, Free Style, Half Nelson
<u>Kho-Kho</u>	Runner, Chaser, Pole by, Foul
<u>Boat Race</u>	Cox
<u>Gymnastics</u>	Parallel Bar, Horizontal Bar, Un-even Bar, Sit-Up, Push-Up
<u>Volleyball</u>	Spikers, Boosters, Sidearm, Penetration
<u>Polo</u>	Bunker, Mallet, Chukker
<u>Billiards and Snookers</u>	Jigger, Scratch, Pot, Cue, Baulk, Cannon, In-Off
<u>Bridge</u>	Revoke, Ruff, Rummy, Dummy, Little Slam, Trump, Diamonds, Trick, Bluff

Other Name for Sportspersons—

<u>Player or Sportsperson</u>	<u>Best known as</u>
<u>Boxer</u>	Pugilist, Fisticuffs
<u>Table Tennis</u>	Paddler
<u>Basketball</u>	Hooper or Baller
<u>Track and Fields</u>	Athlete
<u>Badminton</u>	Shuttler
<u>Wrestling</u>	Grappler
<u>Kabaddi</u>	Defensive Side- Antis/ Attacking Side (Offence)- Raider
<u>Volleyball Player</u>	Spiker or Blocker
<u>Football Goalkeeper</u>	Netminder or Goalie

National Sports of Different Countries—

- **China**— Table Tennis
- **Malaysia**— Badminton
- **Bangladesh**— Kabaddi
- **Bhutan**— Archery
- **Iran**— Freestyle Wrestling and Polo
- **Canada**— Lacrosse (Summer), Ice Hockey (Winter)
- **Japan**— Sumo or Judo
- **Sri Lanka, Nepal**— Volleyball
- **Spain**— Bull Fighting
- **Scotland**— Golf
- **Afghanistan**— Buzkashi
- **Brazil, France**— Football
- **India, Pakistan**— Hockey
- **USA**— Baseball
- **Australia, England, Bahamas**— Cricket
- **Argentina**— Juego Del Pato
- **Russia**— Bandy (Russian Hockey or A Type of Ice Hockey)

Nicknames of famous Players—

- ❖ Nole— **Novak Djokovic (Serbia)**
- ❖ Dada, Bengal Tiger— **Saurav Ganguly**
- ❖ Wizard of Hockey, Magician of Hockey, Hockey ka Jaadugar — **Dhyan Chand**
- ❖ Jumbo, Apple— **Anil Kumble**
- ❖ Turbanator, Bhajji— **Harbhajan Singh**
- ❖ Baroda Express— **Zaheer Khan**
- ❖ Bombay Duck— **Ajit Agarkar**
- ❖ Thala, MSD, Mahi, Captain Cool— **Mahendra Singh Dhoni**
- ❖ Payyolli Express, Udanpari — **PT Usha**
- ❖ Flying Sikh — **Milkha Singh**
- ❖ Black Pearl, God of Football — **Pele (Brazil Footballer)**
- ❖ Silent Killer— **Mahmudullah Riyad (Bangladesh)**
- ❖ Indian Express — **Mahesh Bhupathi, Leander Paes**
- ❖ Rawalpindi Express — **Shoaib Akhtar**
- ❖ Dhing Express — **Hima Das**
- ❖ SKY, India's Mr. 360— **Surya Kumar Yadav (Cricket)**
- ❖ The Wall, Jamie, Mr. Dependable — **Rahul Dravid**
- ❖ Master Blaster, Bombay Bomber, God of Cricket— **Sachin Tendulkar**
- ❖ Little Master— **Sunil Gavaskar**
- ❖ Multan Ka Sultan, Nawab of Najafgarh — **Virender Sehwag**
- ❖ Haryana Hurricane — **Kapil Dev** (Autobiography: - Straight from the Heart)

Famous Stadiums of the World—

- ❖ **Lord's (Cricket)** — London (UK), It is also known as Mecca of Cricket or Home of Cricket.
- ❖ **MCG (Cricket)** — Melbourne (Australia)
- ❖ **Sharjah Cricket Stadium** — United Arab Emirates (UAE)
- ❖ **Dhyan Chand Stadium (Hockey)** — New Delhi (India)
- ❖ **Wembley Stadium (Football)** — London (UK)
- ❖ **Santiago Bernabeu (Football)** — Madrid (Spain)
- ❖ **M. Chinnaswamy Stadium (Cricket)** — Bangalore (Karnataka)
- ❖ **The Bell Center (Ice Hockey)** — Quebec (Canada)- Largest ice hockey stadium in the World
- ❖ **Salt Lake (Football)** — Kolkata (India's Biggest Football Stadium)
- ❖ **Narendra Modi Stadium (Cricket)** — Ahmadabad (World's Biggest Cricket Stadium)
- ❖ **Eden Gardens (Cricket)** — Kolkata
- ❖ **Wankhede stadium (Cricket)** — Mumbai
- ❖ **Green Park (Cricket)** — Kanpur
- ❖ **M A Chidambaram (Cricket) also known as Chepauk Stadium** — Chennai
- ❖ **Chail Cricket Stadium** — Dharamshala, Himachal Pradesh (Highest Cricket ground in the world)
- ❖ **Barsapara Cricket Stadium** — Assam
- ❖ **Premadasa Stadium (Cricket)** — Colombo, Sri Lanka
- ❖ **Feroz Shah Kotla (Cricket)** — New Delhi. Its new name is The Arun Jaitley Stadium.
- ❖ **Ekana Stadium (Cricket)** — Lucknow (Uttar Pradesh). Its new name is Atal Bihari Vajpayee Stadium

Sportspersons of Various Sports—

Sports	Players Name
Cricket	Don Bradman, Shane Warne, Vivian Richards, Mithali Raj, Murlidharan
Golf	Tiger Woods, Anirban Lahiri, Aditi Ashok, Jeev Milkha Singh
Badminton	Saina Nehwal, PV Sindhu, Prakash Padukone, Pullela (P) Gopichand, Lakshya Sen, Kidambi Shrikanth
Basketball	Michael Jordan, Satnam Singh
Hockey	Roop Singh, Balbir Singh, Sardar Singh, Dhanraj Pillay, Manpreet Singh, Dhyan Chand
Boxing	Mohammad Ali, Mike Tyson, Mary Kom (Manipur), Vijender Singh, Lovlina Borgohain
Athletics (Sprinter)	Usain Bolt, Asafa Powell, Milkha Singh, PT Usha, Hima Das, Neeraj Chopra, Duttee Chand
Table Tennis	Achanta Sharath Kamal
Shooting	Abhinav Bindra, Gagan Narang, Manu Bhakar, Chandro & Prakashi Tomar
Formula One	Michael Schumacher, Lewis Hamilton, Narain Karthikeyan
Squash	Deepika Pallikal, Saurav Ghoshal
Chess	Koneru Hampi, Vishwanathan Anand
Billiards and Snooker	Pankaj Advani, Geet Sethi
Wrestling	Sushil Kumar, Geeta & Babita Phogat, Bajrang Punia, Yogeshwar Dutt, Ravi Dahiya, KD Jadhav, Deepak Punia, Vinesh Phogat, Sakshi Malik, Amit Panghal
Fencing	Bhavani Devi, Karan Singh, Edoardo Mangiarotti (Italy)
Weightlifting	Mirabai Chanu, Karnam Malleswari, Kunjarani Devi, Sathish Sivalingam, Hossein Rezazadeh (Iran)

Note: Satnam Singh become the first Indian basketball player to picked in National Basketball Association (NBA) in 2015.

Famous Awards and Prizes of the World—

Noble Prize —

- ❖ Started in 1901, in memory of Alfred Nobel (Sweden) (inventor of Dynamite)
- ❖ Alfred Noble—21 Oct 1833 (Stockholm, Sweden) to 10 Dec 1896 (San Remo, Italy)
- ❖ Noble Prize given in Stockholm (Sweden) on every 10 December
- ❖ Given in 6 fields - Physics, Chemistry, Medicine, Peace, Literature, Economics.
- ❖ Peace prize is given in Oslo (Norway)
- ❖ Earlier given in 5 Category, Economics added in 1968 (by Sveriges Riksbank, central bank of Sweden).
- ❖ First woman to get Noble Prize — Madam Curie (Only Woman get Two Times)
- ❖ First Indian and Asian to get Noble Prize — Rabindranath Tagore (1913), for Geetanjali book
- ❖ First Indian Woman — Mother Teresa (1979)- Peace. She is also known as The Saint of the Gutters
- ❖ First Asian and Indian to win Noble Prize in Science— CV Raman (1930) for Raman Effects
- ❖ First Indian to win Noble Prize in Medicine—Har Gobind Khurana (1968) for Artificial Genes
- ❖ First Asian and Indian to win Noble Prize in Economy— Amartya Sen (1998)
- ❖ Youngest Laureate— Malala Yousafzai (Pakistan, 17 Years) (2014- Peace)
- ❖ Oldest Laureate—John B. Goodenough (USA, 97 Years) (2019- Chemistry)

Oscar Award — (Founder- Louis B. Mayer)

- ❖ Also known as Academy Award. Given in Beverly Hills, USA
- ❖ Highest Cinema/ Cinematic Award.
- ❖ Established in 1927 First given in 1929.
- ❖ First Movie to get Oscar— Wings (1927 Silent Movie)
- ❖ First Indian movie nominated for Oscar— Mother India (1957)
- ❖ First Indian to win Oscar Award — Bhanu Athaiya (1982)- Costume Designing, Movie Name- Gandhi, Director-Richard Attenborough (United Kingdom)
- ❖ First Indian to get Two Oscar awards —AR Rahman (2009) for Best Original Score and Best Original Song- Jai Ho, Movie-Slumdog Millionaire (2008).
- ❖ Satyajit Ray was the first Indian to get an Oscar Life Time Achievement Award in 1992

- ❖ **Note:** - Cannes Film Festival is celebrated in France
- ❖ Father of World Cinema — Auguste and Louis Lumiere (Lumiere Brothers)

Grammy Award or Gramophone Award—

- ❖ Highest Music Award in world. Established in 1958 in Los Angeles, USA. First given in 1959.
- ❖ First Indian to win Grammy — Pandit Ravi Shankar, Sitar (1968) for West Meet East.

Pulitzer Prize—

- ❖ Highest Journalism award in the World.
- ❖ Established in 1917 at USA in the honors of Newspaper Publisher Joseph Pulitzer
- ❖ First Indian to win Pulitzer— Gobind Behari Lal (1937).

Booker Prize —

- ❖ Highest Literacy Award in the world. Established in 1969 in UK
- ❖ Salman Rushdie is the first India Born British Indian to win the Booker Prize for Midnight's Children in 1981.
- ❖ Arundhati Roy is the first Indian Citizen to win the Booker Prize for God of Small Things, 1997

Ramon Magsaysay award (31st August Every Year) —

- ❖ Also known as Asia's Noble Prize. Established in 1958 in Manila, Philippines.
- ❖ Given by Philippines government in social and public service for their 7th President.
- ❖ First Indian to win Ramon Magsaysay — Vinoba Bhave in 1958.

Kalinga Award —

- ❖ By UNESCO for Popularization of Science.
- ❖ It is UNESCO Oldest Prize
- ❖ Created in 1952 by Bijoyanand (Biju) Patnaik, Odisha former CM.

Gallantry Awards —

- ❖ Highest Gallantry Award of India or Highest Military Decoration—Param Vir Chakra (PVC)
- ❖ PVC established on 15 August 1947 by Dr. Rajendra Prasad. PVC is also known as "Wheel of the Ultimate Brave"
- ❖ PVC was designed by Mrs. Savitri Khanolkar, inspired from sage Dadhichi, a vedic rishi.
- ❖ PVC has been awarded 21 times (20 from Indian Army and 1 for Air Force Nirmal Jit Singh Sekhon in 1971)
- ❖ First to get Param Vir Chakra — Major Somnath Sharma (03 Nov.1947), 4th Kumaon Regiment.
- ❖ List of all PVC Param Yodha's — Major Somnath Sharma (Posthumous), Naik Jadunath Singh (Posthumous, 1948), Rama Raghoba Rane 1948, Company Havildar Major Piru Singh (Posthumous, 1948), Lance Naik Karam Singh 1948, Captain Gurbachan Singh Salaria (Posthumous, 1961), Major Dhan Singh Thapa 1962, Subedar Joginder Singh (Posthumous, 1962), Major Shaitan Singh (Posthumous, 1962), Lieutenant Colonel Ardeshir Burzorji Tarapore (Posthumous, 1965), CQMH Abdul Hamid (Posthumous, 1967), Lance Naik Albert Ekka (Posthumous, 1971), Flying Officer Nirmal Jit Singh Sekhon (Posthumous, 1971), Major Hoshiar Singh 1971, Second Lieutenant Arun Khetarpal (Posthumous, 1971), Naib Subedar Bana Singh 1987, Major Ramaswamy Parameswaran (Posthumous, 1987), Lieutenant Manoj Kumar Pandey (Posthumous, 1999), Grenadier Yogender Singh Yadav 1999, Rifleman Sanjay Kumar 1999, Captain Vikram Batra (Posthumous) 07 Jul.1999.
- ❖ Highest Peacetime Gallantry Award — Ashoka Chakra
- ❖ First Woman and Youngest to get Ashoka Chakra — Neerja Bhanot (in 1987)
- ❖ Wartime Award (Highest to Lowest) — Param Vir Chakra> Mahavir Chakra> Vir Chakra
- ❖ Peacetime Award (Highest to Lowest) — Ashok Chakra> Kirti Chakra> Shaurya Chakra

Civilian Awards—

Bharat Ratna —

- ❖ Highest Civilian Award of India. Logo- Peepal Tree Leaf, Sun in Centre, Devanagari Script
- ❖ Established on 2 January 1954 by Dr. Rajendra Prasad
- ❖ First Recipient— C Rajagopalachari, S Radhakrishnan, CV Raman
- ❖ First woman to get Bharat Ratna — Indira Gandhi.
- ❖ First to get posthumously— Lal Bahadur Shastri
- ❖ First Foreigner to get Bharat Ratna — Khan Abdul Ghaffar Khan (1987)
- ❖ Other Civilian Awards— Padma Vibhushan, Padma Bhushan, Padma Shri.
- ❖ Civilian Award— Bharat Ratna> Padma Vibhushan> Padma Bhushan> Padma Shri

- ❖ Padma Awards are declared on Republic Day by President of India.
- ❖ Other Padma Awards logo is Lotus Flower in Centre and Name in Devanagari Script.

Sports Awards in India—

- ❖ Highest Sports Award in India—Major Dhyan Chand Khel Ratna Award.
- ❖ Earlier known as Rajiv Gandhi Khel Ratna Award.
- ❖ Started in 1991-1992, First Recipient— Viswanathan Anand (Chess).
- ❖ Prize Money — 25 Lakh ₹, Given Every Year on 29th August.
- ❖ Arjuna Award — Started in 1961.
- ❖ Dronacharya Award — Started in 1985, given to Coaches.

Literature Awards in India—

- ❖ Highest Literature Award in India — Jnanpith (Gyanpeeth) Award, started in 1961, First Given in 1965
- ❖ First to get Jnanpith — G. Shankar Kurup, Malayalam Poet
- ❖ First woman to get Jnanpith— Ashapura Devi, Bengali Poet
- ❖ Sahitya Academy Award (1954) — 24 languages (22 Constitution Language + English and Rajasthani)
- ❖ Other literature awards — Saraswati Samman, Vyas Samman, Yuva Puruskar etc.

Film Awards in India —

- ❖ Highest Film Award in India — Dada Saheb Phalke Award, Established in 1969.
- ❖ Full Name of Dada Saheb Phalke — Dhundiraj Govind Phalke
- ❖ First Recipient of Dada Saheb Phalke Award — Devika Rani.
- ❖ Devika Rani is considered as the First Lady of Indian Cinema
- ❖ Highest Film Festival of India- International Film Festival of India (IFFI), Goa from 1952
- ❖ First Movie of India — **Raja Harishchandra in 1913 by Dada Saheb Phalke (Silent Movie)**
- ❖ India first talking Movie — **Alam Ara (1931)**
- ❖ Most number of songs movie — **Indra Sabha (71 Songs) in 1932**
- ❖ Longest Indian Movie — **LOC Kargil (4 Hours and 15 Min.)**, 2nd is Mera Naam Joker (close to seconds)
- ❖ First Colour Movie — **Kisan Kanya (1937)**
- ❖ Longest Song — **Ab tumhare hwaale watan saathiyo (20 Minute)**
- ❖ First Sanskrit Movie of India — **Adi Shankara**
- ❖ First Indian 3-D Movie **My Dear Kuttichathan (1984) in Malayalam.**

Other awards —

- **Gopal Ratna Award**— Animal Husbandry
- **Dhanwantari Award** — Medical Science.
- **Golden Globe Award** — Film
- **Pritzker prize, Aga Khan Award** — Architecture
- **Abel Prize, Field Medal (Math Noble)** – Mathematics
- **Laureus Award** – Sports
- **Merlin Award**– Magic
- **BC Roy Award** — Medical Science (Given on 1 July every year by President)
- **Sushila Devi Award, Bihari Award, Vachaspati Award (Sanskrit)** — Literature
- **Medini Prize**— Environment
- **Shanti Swaroop Bhatnagar Award** — Science & Tech.
- **Norman Borlaug Prize, Bowelay Award** — Agriculture
- **Kalidas Samman, Tansen Award** — Music
- **Juliet Curie Award**– Peace
- **Templeton Prize** – Science
- **A.M Turing Award**– Computer Science

Books and Authors—

Authors	Books
Magasthenese	Indica
Matilda	Roald Dahl (1988)
Harper Lee	To kill A Mockingbird (1960)
Mahabhasya	Patanjali
William Wordsworth	The Prelude
Bharat Muni (Bharata)	Natyashastra
Kalidasa	Meghduta, Abhijana Shakuntalam, Vikramorvashi, Malavikagnimitra, Raghuvamsham, Kumarasambhava

Banabhatta	Harsh Charita, Kadambari
Harshavardhan	Nagananda, Ratnavali, Priyadarshika
William Shakespeare	Romeo Juliet, Macbeth, Othello, Hamlet, A Mid-Summer, Night Dreams, King Lear, The Tempest, As You Like It, Prince of Denmark, Merchant of Venice
Vatsyayana	Kamasutra, Nyaya Sutra
Kabir	Granthavali, Bijak
Jaidev	Geet Govind
Rajasekhar	Kavyamimamsa, Karpuramanjari
Vishakhadatta	Mudrarakshasa (Ring of the Demon)
Shudraka	Mrichhakatika (The Little Clay Cart)
Al Beruni	Kitab-ul-Hind (Tehkik-i-Hind)
Hieun Tsang	Si-Yu-Ki
Fa Hien	Fo-Kyo-Ki
Chander Bardai	Prithviraj Raso
Mahatma Gandhi	My Experiments with Truth, Hind Swaraj, India of My Dreams
Dadabhai Naoroji	Poverty and Un-British rule in India, Drain of Wealth
Swami Vivekananda	Raja Yoga, Karma Yoga, Bhakti Yoga, Jnana Yoga
Bankim Chandra Chatterjee	Anand Math (1882)
Dinbandhu Mitra	Neel Darpan or The Indigo Planting Mirror
Rabindranath Tagore	Geetanjali
Lala Lajpat Rai	Un-Happy India
Jawahar Lal Nehru	Discovery of India (Bharat Ek Khoj)
RK Narayan	Malgudi Days (Swami was main character), Guide
Sarojini Naidu	Golden Threshold
Munshi Premchand (Dhanpat Rai Srivastava)	Godan, Gaban, Nirmala, Poos ki Raat, Seva Sadan, Panch Parmeshwar, Do Bailon ki Katha, Namak Ka Daroga
Rudyard Kipling	Jungle Book (Pench National Park, MP), Mowgli, Bagheera, Baloo was main character
Leo Tolstoy	War and Peace
Adam Smith	Wealth of Nations
Karl Marx	Das Capital, The Communist Manifesto
Abul Kalam Azad	India Wins Freedom,
Aurobindo Ghosh	Life Divine, Savitri, Hour of God
S. Radha Krishnan	Hindu view of Life, Indian Philosophy, Eastern Religion & Western Thought
Dayanand Saraswati	Satyarth Prakash
Panini	Ashtadhyayi
Vishnu Sharma	Panchatantra
Salman Rushdie	Midnight's Children
Arundhati Roy	The God of Small Things, Azadi, The Ministry of Utmost Happiness
Plato	The Republic
Jonathan Swift	Gulliver's Travel
Sunil Gavaskar	Sunny Days
Sachin Tendulkar	Playing It My Way
Milkha Singh	The Race of My life
Maxim Gorky	Mother
Charles Dickens	Great Expectations, Hard Times, Pickwick
Charles Darwin	Origin of Species
JK Rowling	Harry Potter (7 parts- 1 st Philosopher's Stone, Last- The Deathly Hallows) owl name of Harry Potter was- Hedwig

HG Wells	Time Machine, The War of the Worlds
Stephen Hawking	Brief History of Time, Blackhole and the Baby Universe
Nelson Mandela	Long Walk to Freedom
MN Roy	India's Message, India in Transition, What Do We Want
APJ Abdul Kalam	Wings of Fire, Ignited Minds, India-2020
Hitler	Mein Kampf (My Struggle)
Ramachandra Guha	India After Gandhi
Arvind Adiga	White Tiger, The Last Man in Tower
Lokmanya Tilak	Gita Rahasya, The Arctic Home of the Vedas
Rajendra Prasad	India Divided, Satyagraha at Champaran, At the Feet of Mahatma Gandhi
Jyotiba Phule	Ghulam Gori (1873)
Abul Fazl	Ain-I-Akbari, Akbarnama
Khushwant Singh	Train to Pakistan, We Indians, The Fall of the Kingdom of Punjab
Chanakya (Kautilya)	Arthashastra
Malik Mohammad Jayasi	Padmavat (1540)
Kalhan	Rajtarangini (History of Kashmir)
Ruskin Bond	Blue Umbrella, The Room on the Roof, A Little Book of Life

Indian Defence –

- Army, Navy and Air Force Head Quarter (All)- New Delhi
- Indian Navy Commands – 3
- Indian Military Academy –Dehradun, UK
- National Defence Academy –Khadakwasla (Pune, MH)
- Army Cadet College – Dehradun, Uttarakhand
- Indian Air force Academy –Dandigul (Hyderabad, Telangana)
- Infantry School– Mhow, MP
- Defence Services Staff College – Wellington, Nilgiri Hills, Tamil Nadu.
- First Commander Chief of Indian Army –Gen. KM Cariappa
- First Chief of Air Staff –Subroto Mukherjee
- First Field Marshal – Sam Hormusji Framji Jamshedji Manekshaw (Amritsar, 1914-2008)
- Sam Manekshaw become Field Marshal on 1 January 1973. Manekshaw was also army chief during Indo- Pak war in 1971.
- First Defence Minister of India– Sardar Baldev Singh
- There are 62 Cantonment in India. Famous are Meerut Cantt (1803), Ambala (1843)
- Oldest Cantonment (Cantt.) of India Barrackpore, near Calcutta, West Bengal 1765
- Danapur (Dinapur) is 2nd oldest Cantt. of India, 1765, is located in Patna, Bihar.
- Since Independence there are only two Field Marshals - Sam Manekshaw and K M Cariappa and one Marshal of Indian Air Force (IAF) Arjan Singh (in 1964). Marshal of the Air Force is equivalent to Field Marshal in the Indian Army.
- Indian Air Force largest exercise – Gagan Shakti (conducted every five years)
- Oldest Paramilitary Force – Assam Rifles (24 March 1835) as a militia called the Cachar Levy
- Rafale (France), Tejas (HAL), Sukhoi (HAL), MIG-21 (Russia), Mirage-2000 (France), ORION-3 (USA), S-400 Air Defence Missile System (Russia) are famous fighter system of India.
- Rudram missile is the first indigenously developed anti-radiation missile designed by DRDO.
- The Central Armed Police Forces (CAPF) refers to seven security forces under Ministry of Home Affairs– Assam Rifles (AR), Border Security Force (BSF), Central Industrial Security Force (CISF), Central Reserve Police Force (CRPF), Indo Tibetan Border Police (ITBP), National Security Guard (NSG), Sashastra Seema Bal (SSB)
- First Home Minister of India – Sardar Patel
- First Army Chief of India – Field Marshal Kodandera Madappa (KM) Cariappa
- Current Army Chief of India – General Upendra Dwivedi (30th) from 30 June 2024
- Commander-in-chief of Armed Forces –The President of India
- Agni Path scheme is associated with reform in Defence. In this Defence person called as Agni Veer

- CRPF- 1939, HQ- New Delhi
- ITBP and Home Guards founded on – 1962
- 88th Battalion of CRPF is known as **Mahila Battalion**, is the World 1st Paramilitary Force for Women.
- It was Founded on 30 March 1986.
- Territorial Army lies for Civilians between 18 to 35 Years
- Indian Army Commando is known as – **Para SF (Special Forces)**
- Indian Navy Commando is known as – **Marcos**
- Indian air Force Commando is known as – **Garuda**
- Indian Army Motto – Service Before Self or Seva Asmakam Dharma
- Indian Navy Motto – Sam no Varunah
- Indian Air Force Motto – Touch the sky with Glory
- Highest Decorated Regiment – Sikh (2 PVCs, 14 MVCs, 5 KCs, 67 Vir Chakras, 72 Battle Honors, 15 Theatre Honors and 5 COAS and 1596 other Gallantry Awards)
- First Indian Submarine – INS Kalvari - 08 Dec 1967
- First Nuclear Submarine – INS Chakra
- First Aircraft Carrier – INS Vikrant (Codename- R11)
- NCC and Territorial Army both founded in 1948
- BSF (1965), CISF (1969), NSG (1984) founded.
- First Indigenous Submarine – INS Shalki – 06 Feb 1992
- First Indigenous Nuclear Submarine – INS Arihant

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

Important Exercises—

- AUSINDEX**– India- Australia
- VARUNA, SHAKTI, GARUDA**– India- France
- DUSTLIK**– India- Uzbekistan
- EKOVERIN**– India- Maldives
- MITRA SHAKTI, SLINEX**– India- Sri Lanka
- SAMPRITI**– India- Bangladesh
- HAND IN HAND**– India- China
- JIMEX**– India- Japan
- SURYA KIRAN**– India- Nepal
- AJEYA WARRIOR, KONKAN**– India- United Kingdom
- VAJRA PRAHAR, MALABAR**– India- USA
- INDRA**– India- Russia
- MAITREE**– India- Thailand

Commands of Indian Army (7)

1. Western Command	Chandimandir
2. Eastern Command	Kolkata
3. Northern Command	Udhampur
4. Southern Command	Pune
5. Central Command	Lucknow
6. Army Training Command	Shimla
7. South-Western Command	Jaipur

Commands of Indian Navy (3)

1. Western Naval Command	Mumbai
2. Eastern Naval Command	Vishakhapatnam

3. Southern Naval Command Cochin

Commands of Indian Air Force (7)

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	Thiruvananthapuram
6. Training Command	Bengaluru
7. Maintenance Command	Nagpur

India's Nuclear Program —

- Father of Nuclear program in India — Homi Jahangir Bhabha.
- Homi J. Bhabha was Indian Nuclear Physicist, who was the founding Director and Professor of Physics at the Tata Institute

of Fundamental Research.

- Bhabha Atomic Research Center (BARC) — 1954 (Trombay, Maharashtra).
- First Atomic Reactor — Apsara (1956).
- First Atomic Power Station— Tarapur, Maharashtra
- Heavy Water Limited is in — Trombay, Maharashtra
- India's First Nuclear Test — 1974 – Code Name- Smiling Buddha (Pokhran, Rajasthan)
- India Became a Nuclear Power on — 11 May 1998 Code Name- Operation Shakti
- First Country to have atomic deal with India — France in 2008
- India has only 2% of World's Uranium reserves and 25% of the World's Thorium reserves.
- Nuclear Weapons, X-Ray Wastes, Nuclear Plant Fallout, Nuclear Bomb are the source of Radioactive pollution.

Indian Defence Research Program—

- Defence Research and Development Organization (DRDO) - 01-01-1958.
- Father of Indian Missile Technology— APJ Abdul Kalam. IGMDP Program (1983)
- Prithvi — First Missile of India (in 1988). surface-to-surface short-range ballistic missile (SRBM)
- Agni — surface-to-surface Missile
- Agni V is India's first Inter Continental Ballistic Missile (ICBM) and nuclear warhead capable.
- Trishul — surface-to-air Missile
- Nag — Anti-Tank Guided Missile with Fire and Forget top attack capability
- Akash — surface-to-air Missile
- Astra and Novator are only two air-to-air missiles of India.
- Tejas — First India made Light Combat Aircraft.
- BrahMos — Joint venture of Russia and India (named after Moskva & Brahmaputra River).
- T-90 Bhishma (Purchased from Russia), T-72, Karna, Ajeya, Sarath are Tanks.
- Arjuna (Mk-1) was the First Battle Tank of India.
- Chetak, Mil Mi-24 & 26, Dhruv, Chinook, Rudra and Prachand, Apache are Helicopter

Indian Space Program—

- Father of Indian Space Program— Vikram Sarabhai.
- Space Program started in -1962.
- Indian Space Research Organization (ISRO) headquarters located at — Bengaluru (Antariksh Bhavan).
- ISRO founded on 15 August 1969.
- First ISRO Chairman — Vikram Sarabhai
- Current ISRO Chairman — S. Somnath (10th)
- First artificial satellite launched by India — Aryabhata, 19 April 1975 (sent by USSR).
- First satellite launched from Indian soil — Rohini (18 July 1980) from Sriharikota, Andhra Pradesh
- First communication satellite of India — APPLE (Ariane Passenger Payload Experiment) on 19 June 1981
- First Mars mission— Mangalyaan (Mars Orbiter Mission or MOM) – 5 November 2013.
- Chandrayaan – 1, First Moon mission of India in 2008, PSLV-XL-C11, Found water on moon.
- Chandrayaan – 2 launched on 22 July 2019, GSLV-MK-III but it was failed during soft landing
- **Tiranga point** represents the point where Chandrayaan-2 crashed

Chandrayaan 3—• Chandrayaan – 3 is India's 3rd Lunar Mission.

- Chandrayaan – 3 launched from Satish Dhawan Space Center (SDSC) in Sriharikota by LVM3 – M4 rocket
- Vikram Lander and Pragyan Rover is in Chandrayaan – 3
- Chandrayaan 3 landed on Moon on Date August 23, 2023.
- India become first country to soft-land on the lunar south pole
- Where Chandrayaan-3's Vikram Lander successfully touched lunar surface, that place will be known as **Shiv shakti Point**.
- First Indian in space — Rakesh Sharma (1984).
- First Female Astronaut — Kalpana Chawla (1997).
- First human space mission — Gaganyaan (2024-25).
- Humanoid robot in Gaganyaan — Vyomitra.
- First person selected for the Gaganyaan mission — Nikhil Rath
- Satish Dhawan Space Center (SHAR)—Sriharikota (Andhra Pradesh) on Pulicat lake.

- ISRO has two launch pads for space missions — Sriharikota (AP) and Kulasekarapattinam Spaceport (Tamil Nadu)
- India's solar Mission name is — Aditya L1, launched on 2nd Sept. 2023 and reached on 6 January 2024.
- Vikram Sarabhai space center — Thumba, Keralam.
- Master Control Facility (MCF) is located at Hassan (Karnataka) and Bhopal (MP)
- Infrared Observatory (MIRO) located at Mount Abu, Rajasthan
- Solar Observatory located at Udaipur, Rajasthan
- PSLV — Polar satellite launching vehicle.
- GSLV — Geo-synchronous launching vehicle
- RLV-TD — Reusable Launch Vehicle- Technology Demonstration
- Scramjet (Supersonic Combusting Ramjet) and VIKAS are engines used in rocket launching.

International Space Programs—

- First satellite— Sputnik (1957) -Russia.
 - First animal in space — Lyca (Female Dog) in 1959- Russia.
 - First Human in space — Major Yuri Gagarin (1961) from Russia.
 - First woman cosmonaut— Valentina Tereshkova (1963) from Russia.
 - First Human on Moon — Neil Armstrong (20 July 1969). (Total- 12 Human to Scale Moon)
 - Neil Armstrong and Buzz Eldrin's space ship name — Apollo-11.
 - USA, Russia, China and India are only few countries to successfully land on the Moon.
 - World first atomic reactor — Chicago Pile-1 (Chicago, USA) in 1942.
 - First mission to successful reached on Mars orbit — Mariner- 9 (1971)
 - First mission to landed on Mars surface — Viking -1 (1976).
 - Space agency of USA — NASA (29 July 1958)
 - Space agency of Russia — Cosmorus or Roscosmos
 - Space agency of India — ISRO
 - Space agency of Japan — JAXA
 - Space agency of France— CNES
 - Space agency of Europe Continent— European Space Agency (ESA), Group of 22 Countries
 - Space agency of China — CNSA (China National Space Administration)
 - Space agency of Pakistan — The Space & Upper Atmosphere Research Commission (SUPARCO)
 - First space shuttle — Columbia.
 - Kalpana Chawla died in 2003 in Columbia -13
 - Hubble Space Observatory related with NASA, USA (Launched in 1990)
 - JAMES WEBB SPACE TELESCOPE (JWST) also related with NASA, USA (Launched in Dec 2021)
 - India's first space observatory is ASTROSAT in 2015
 - Cryogenic engines are used in Satellite launch work with very low temperature.
 - Oxygen liquifies at -183° C and Hydrogen at -253° C in cryogenic engine.
 - Starlink Project related with Internet in Low Earth Orbit by Space-X (Elon Musk, USA). Elon Musk is richest person of world.
- Note: -1.** India's Missile Testing range is located at Chandi Pur (Odisha), Balasore and APJ Abdul Kalam Island (Previously known as Wheeler Island) at the coast of Odisha. **2.** Nuclear Test Range is located in Thar Desert at Pokhran (Rajasthan) **3.** Satellite (Rocket) Launching Pad and All Space missions of India is done at Sriharikota **4.** There are 9 countries in the world which have the nuclear weapons- Russia (5889), USA (5224), China (410), France (290), UK (225), Pakistan (170), India (164) and Israel (90). **5.** Only 6 Countries which have their own Cryogenic Engine- Russia, USA, France (ESA), Japan, China and India.

International Navigation System—

- **Global Positioning System (GPS)**— USA
- **Galileo**— European Union
- **Indian Regional Navigation Satellite System (IRNSS)** — India
- **Navigation Indian Constellation (NavIC)** — India (NavIC means Sailor or Navigator)
- **Quasi-Zenith Satellite System (QZSS)** — Japan
- **BeiDou or BDS**— China
- **GLONASS**— Russia

States & UTs with Capital—

- | | | |
|------------------------------------|--------------------------------------|-----------------------------------|
| • Andhra Pradesh— Amaravati | • Arunachal Pradesh— Itanagar | • Assam— Dispur |
| • Bihar— Patna | • Chhattisgarh— Raipur | • Goa— Panaji |
| • Gujarat— Gandhinagar | • Haryana— Chandigarh | • Himachal Pradesh— Shimla |

- Jharkhand—**Ranchi**
- Kerala—**Thiruvananthapuram**
- Meghalaya—**Shillong**
- Odisha—**Bhubaneswar**
- Sikkim—**Gangtok**
- Tripura—**Agartala**
- West Bengal—**Kolkata**
- Ladakh—**Leh**
- Jammu and Kashmir—**Sri Nagar**
- Dadra & Nagar Haveli and Daman & Diu—**Daman**

- Karnataka—**Bengaluru**
- Madhya Pradesh—**Bhopal**
- Mizoram—**Aizawl**
- Punjab—**Chandigarh**
- Tamil Nadu—**Chennai**
- Uttar Pradesh—**Lucknow**
- Chandigarh—**Chandigarh**
- Lakshadweep—**Kavaratti**
- Andaman and Nicobar Island—**Port Blair**

- Maharashtra—**Mumbai**
- Manipur—**Imphal**
- Nagaland—**Kohima**
- Rajasthan—**Jaipur**
- Telangana—**Hyderabad**
- Uttarakhand—**Dehradun**
- Delhi—**Delhi**
- Puducherry—**Pondicherry**

Note: ● Chandigarh (The City Beautiful) was designed by — Le Corbusier (France). Got its name from Chandi Devi Temple.

- Rock Garden at Chandigarh was designed by — Nek Chand Saini.
- Uttarakhand has two capitals — Dehradun (Winter) and Gairsain (Summer)
- Himachal Pradesh has two capitals — Dharamshala (Winter) and Shimla (Summer)
- Andhra Pradesh has two capitals — Amaravati and Visakhapatnam (Vizag). Visakhapatnam is known as City of Destination
- Mumbai is the financial capital of India.

Countries and Capitals —

- | | | |
|-----------------------------------|--|--|
| ● India— New Delhi | ● Oman— Muscat | ● Bahamas— Nassau |
| ● Bahrain— Manama | ● Barbados— Bridgetown | ● Uzbekistan— Tashkent |
| ● Uruguay— Montevideo | ● Paraguay— Asuncion | ● Namibia— Windhoek |
| ● Mozambique— Maputo | ● UAE— Abu Dhabi | ● Botswana— Gaborone |
| ● Brazil— Brasilia | ● Vatican City— Vatican City | ● Myanmar (Burma) — Naypyidaw (Rangoon) |
| ● Algeria— Algiers | ● Argentina— Buenos Aires | ● Australia— Canberra |
| ● Austria— Vienna | ● Bangladesh— Dhaka | ● Malta— Valletta |
| ● Belgium— Brussels | ● Madagascar— Antananarivo | ● Macedonia— Skopje |
| ● Bhutan— Thimphu | ● Canada— Ottawa | ● Chile— Santiago |
| ● Mali— Bamako | ● China— Beijing | ● Monaco— Monte Carlo |
| ● Congo Republic— Kinshasa | ● Czech Republic— Prague | ● Cyprus— Nicosia |
| ● Mauritius— Port Louis | ● Denmark— Copenhagen | ● Egypt— Cairo |
| ● Cambodia— Phnom Penh | ● France— Paris | ● Germany— Berlin |
| ● Ghana— Accra | ● Kyrgyzstan— Bishkek | ● Jamaica— Kingston |
| ● Greece— Athens | ● Indonesia— Nusantara, Jakarta | ● Iran— Tehran |
| ● Iraq— Baghdad | ● Japan— Tokyo | ● Jordan— Amman |
| ● Guyana— Georgetown | ● Israel— Jerusalem | ● Kazakhstan— Nur Sultan |
| ● Kenya— Nairobi | ● Libya— Tripoli | ● Malaysia— Kuala Lumpur |
| ● Mongolia— Ulaanbaatar | ● Mexico— Mexico City | ● Ecuador— Quito |
| ● Afghanistan— Kabul | ● Nepal— Kathmandu | ● New Zealand— Wellington |
| ● North Korea— Pyongyang | ● Norway— Oslo | ● Pakistan— Islamabad |
| ● Philippines— Manila | ● Poland— Warsaw | ● Portugal— Lisbon |
| ● Qatar— Doha | ● Russia— Moscow | ● Nigeria— Abuja |
| ● Saudi Arabia— Riyadh | ● South Korea— Seoul | ● South Africa— Pretoria |
| ● South Sudan— Juba | ● Sudan— Khartoum | ● Ethiopia— Addis Ababa |
| ● Rwanda— Kigali | ● Italy— Rome | ● Switzerland— Bern |
| ● Netherlands— Amsterdam | ● Thailand— Bangkok | ● Syria— Damascus |
| ● Lebanon— Beirut | ● Uganda— Kampala | ● United Kingdom (England)— London |
| ● Ukraine— Kyiv | ● USA— Washington DC | ● Turkmenistan— Ashgabat |

- Vietnam—**Hanoi**
- Fiji—**Suva**
- Cuba—**Havana**
- Turkey—**Ankara**
- Hungary—**Budapest**
- Ireland—**Dublin**
- Morocco—**Rabat**
- Sierra Leone—**Freetown**
- Nicaragua—**Managua**

- Venezuela—**Caracas**
- Columbia—**Bogota**
- Azerbaijan—**Baku**
- Yemen—**Sanaa**
- Sweden—**Stockholm**
- Spain—**Madrid**
- Albania—**Tirane**
- Tanzania—**Dodoma**
- Sri Lanka—**Sri Jayawardene Kotte, Colombo**
- Zimbabwe—**Harare**
- Peru—**Lima**
- Maldives—**Male**
- Belarus—**Minsk**
- Iceland—**Reykjavik**
- Serbia—**Belgrade**
- Angola—**Luanda**
- Armenia—**Yerevan**

Country and Currency—

Note: - Strongest, Valuable and Powerful Currency in the world is - Kuwaiti Dinar (1 Dinar= 270 Indian ₹ Approx.)

- Cheapest currency of the world is - Iranian Rial (1 Rial= 505 Indian ₹ Approx.)
- Bitcoin is a cryptocurrency (a virtual currency) designed to act as money and mode of payment online. Bitcoin is Peer-to-Peer Electronic Cash System. Satoshi Nakamoto (Japan) created the bitcoin.
- Canada, USA, Australia, Zimbabwe, New Zealand currency are Dollar.
- Argentina, Philippines, Chile, Cuba, Mexico and Uruguay currency are Peso
- Nepal, Sri Lanka, Pakistan and India currency are Rupee
- European Union or Euro Zone (a group of 27 countries), currency is Euro.

- Vietnam—**Dong**
- Indonesia—**Rupiah**
- Japan—**Yen**
- Kuwait—**Dinar**
- Saudi Arabia, Qatar—**Rial**
- Denmark and Norway—**Krone**
- Peru—**Sol**
- United Kingdom (UK) —**Pound Sterling**
- Sweden—**Kroner**
- Egypt—**Pound**
- Spain, Portugal, Ireland—**Euro**

- Bangladesh—**Taka**
- Azerbaijan—**Manat**
- Paraguay—**Guarani**
- Bhutan—**Ngultrum**
- Thailand—**Baht**
- Russia—**Ruble**
- Poland—**Zloty**
- Uzbekistan, Kyrgyzstan—**Som**
- Laos—**Kip**
- South Africa—**Rand**

- China—**Yuan, Renminbi**
- Maldives—**Rufiyaa**
- Korea—**Won**
- Myanmar—**Kyat**
- UAE—**Dirham**
- Turkey—**Lira**
- Israel—**Shekel**
- Kazakhstan—**Tenge**
- Malesia—**Ringgit**
- Hungary—**Forint**

Legislatures or Parliament of various Countries—

Note: - Oldest Parliament of the world is – **Althing (Iceland)** was built in 930 AD.

- Argentina—**National Congress**
- Bangladesh—**Jatia Sansad**
- Denmark—**Folketing**
- Israel—**Knesset**
- UAE—**Majlis-Al-Shura**
- Russia—**Duma**
- Afghanistan—**Shora**
- Bhutan—**Tshogdu**
- Germany—**Bundestag**
- Myanmar—**Pyithu Hluttaw**
- Nepal—**Rashtriya Panchayat**
- USA—**Congress**
- Oman—**Monarchy**
- Australia—**Federal Parliament**
- India—**Sansad Bhawan**
- Japan—**Diet**
- Norway—**Storting**

Cities on River banks —

- Berlin—**Spree**
- Bonn—**Rhine**
- Prague—**Vltava**
- New York—**Hudson**
- Warsaw—**Vistula**
- Washington DC—**Potomac**
- London—**Thames**
- Sydney—**Parramatta**
- Karachi—**Indus**
- Munich—**Isar**
- Shanghai—**Yangtze**
- Budapest, Vienna—**Danube**
- Baghdad—**Tigris**
- Paris—**Seine (UNESCO)**
- Lahore—**Ravi**
- Yangon (Myanmar)—**Irrawaddy**
- Venice—**Piave and Po River**
- Ankara—**Kazil**
- Perth—**Swan**
- Rome—**Tiber**
- Moscow—**Moskva**
- Cairo—**Nile**
- Tokyo—**Arakawa and Sumida (Through)**

Intelligence Agencies of Different Countries—

- India — RAW (21 Sept 1968) and IB (1920)
- **Note:** RAW (Research and Analysis Wing) was formed by Rameshwar Nath Kao (RN Kao), (PM- Indira Gandhi)
- CBI is Premier Investigating Police Agency in India (1963 by Santhanam Committee)
- USA— FBI (Federal Bureau of Investigation) and CIA (Central Intelligence Agency)
- France— DGSE
- Japan — Naicho
- Israel — Mossad
- Australia— ASIS
- Russia — KGB /GRU
- Pakistan — ISI (Inter Service Intelligence)
- Egypt — Al – Mukhabarat
- Iran — SAVAK
- China— Ministry of State Security (MSS)
- Britain— Military Intelligence (MI -6 or Section-6)

Official Residence—

- **Kremlin**—Russia President
- **White House**—US President
- **Temple Trees**—Sri Lanka Prime Minister
- **The Arg**—Afghanistan President
- **Vatican Palace**—Pope
- **Raj Bhawan**—Governor of Different States in India
- **24 Sussex Drive**—Canada Prime Minister
- **7, Lok Kalyan Marg**—Prime Minister of India
- **10, Downing Street**—Prime Minister of Britain
- **Buckingham Palace**—Queen Elizabeth
- **Rashtrapati Bhawan**—Indian and Nepal President

Seven Old Wonders of the World—

1. Great Pyramid of Giza – Egypt	5. Mausoleum at Halicarnassus – Turkey
2. Hanging Gardens of Babylon – Ancient Mesopotamia (Iraq)	6. Colossus of Rhodes – Greece
3. Statue of Zeus at Olympia – Greece	7. Lighthouse of Alexandria – Egypt
4. Temple of Artemis at Ephesus – Turkey	

Seven New Wonders of the World—

5. Taj Mahal (Agra, India)	5. The Great Wall of China (China)
6. Petra (Jordan)	6. Christ The Redeemer (Brazil)
7. Machu Pichu (Peru)	7. Chichen Itza (Yucatan, Mexico)
8. Roman Colosseum (Rome, Italy)	

Note: Angkor Wat, Cambodia is now considered as 8th wonder of the world (Built by Suryavarman in 12th century).

Famous Airlines of the World—

- **Air India**—India
- **Lufthansa**—Germany
- **Aeroflot**—Russia
- **Delta**—USA
- **Fly Emirates**—UAE
- **Air Ceylon**—Sri Lanka
- **Alitalia**—Italy
- **Quantas**—Australia
- **Garuda Airways**—Indonesia

Famous Universities of the World—

- Oldest University of the world — **Taxila University (Achaemenid Empire or Persian Empire), presently in Pakistan**
- Oxford University — England (world 2nd oldest)- 1096 AD
- Cambridge University — England (world 3rd oldest)- 1209 AD
- Stanford University, California University, Harvard University, Massachusetts University — USA
- The University of Auckland — New Zealand
- McGill University, British Columbia University — Canada

Surnames of Famous Personalities—

- **Grand Old Man of India**— Dadabhai Nauroji
- **Rajaji** — Chakrabarty Rajgopalachari
- **Mahamana, Prince of Beggars**— Madan Mohan Malviya
- **Desh Ratna**— Dr. Rajendra Prasad
- **Nightingale of India, Bharat Kokila**— Sarojini Naidu
- **Gurudev, Kaviguru** — Rabindranath Tagore
- **Fuehrer (Leader)** — Hitler
- **Patriot of Patriots, Netaji**— Subhash Chandra Bose
- **Acharya**— Vinoba Bhave
- **Light of Asia, Shakyamuni**—Gautam Buddha
- **Lady with the Lamp** — Florence Nightingale (Nursing)
- **Sparrow** — General Rajender Singh
- **Flying Sikh, Udan Sikh** — Milkha Singh
- **Martin Luther King of India**— Swami Dayanand Saraswati
- **Udanpari** — PT Usha
- **Deshbandhu** — CR Das
- **Chacha, Panditji**— JL Nehru
- **Lok Nayak** — Jayaprakash (JP) Narayan

- **Lokmanya** — Bal Gangadhar Tilak
- **Punjab Kesari** — Lala Lajpat Rai
- **Little Corporal** — Napoleon Bonaparte
- **Banga Bandhu** — Mujibur Rahman
- **Sher – e – Kashmir** — Sheikh Abdulla
- **Shaheed-e-Azam, Prince of Martyrs**— Sardar Bhagat Singh
- **Iron lady of India, Priyadarshini**— Indira Gandhi
- **Frontier Gandhi, Badshah Khan**— Khan Abdul Ghaffar Khan
- **Machiavelli of India**— Chanakya
- **Bismarck of India, Iron Man, Strong Man** — Sardar Patel
- **Man of Peace**— Lal Bahadur Shastri
- **Bapu, Father of the Nation, Mahatma**— M K Gandhi
- **Quaid – e – Azam** — Mohammad Ali Jinnah
- **Deenabandhu**— C F Andrews
- **Jawahar of Uttarakhand** — Jagmohan Singh Negi
- **Madiba** — Nelson Mandela

Top Languages Spoken in the World—

- **English** — Largest spoken in the world (1131 million) also richest vocabulary in the world
- **Mandarin** — 2nd highest spoken in the world (1117 million)
- **Hindi** — 3rd highest spoken in the world (615 million)
- 4th Spanish, 5th French, 6th Standard Arabic, 7th Bengali, 8th Russian, 9th Portuguese, 10th Indonesian
- Official language of Brazil, Mozambique is Portuguese
- Official language of Austria is German.
- Official language of Afghanistan is Dari and Pashto
- Official language of Myanmar is Burmese.
- Official language of Iran is Persian.
- Official language of Argentina, Venezuela is Spanish
- Official language of Pakistan is Urdu
- Official language of Sri Lanka is Sinhala and Tamil.
- Official language of Israel is Hebrew.
- Official language of Egypt is Arabic.

National Animals of Different Countries—

- India, Bangladesh — Royal Bengal Tiger
- Pakistan — Markhor
- Russia— Eurasian Brown Bear
- Afghanistan — Snow Leopard
- Japan — Green Pheasant
- New Zealand — Kiwi
- China — Giant Panda
- Scotland — Unicorn
- Nepal — Cow
- Bhutan — Takin
- Greece — Dolphin
- Spain — Noble Bull

Beauty Pageant—

Miss World—

- Miss World is the oldest international beauty pageant created by Eric Morley (1951)
- Head Quarter— London (United Kingdom)
- First winner of Miss World— Kerstin "Kiki" Hakansson of Sweden (1951)
- First Indian and Asian to become Miss World— Reita Faria (1966)
- There are Six Miss World from India— Reita Faria (1966), Aishwarya Rai (1994), Diana Hayden (1997), Yukta Mookhey (1999), Priyanka Chopra (2000) and Manushi Chhillar (2017)
- 2024 Miss World— Krystyna Pyszkova (Czech Republic)
- India hosted the 2024 (71th Edition) Miss World Beauty Pageant after 1996 at Mumbai

Miss Universe—

- Miss Universe is the 2nd oldest international beauty pageant by Pacific Mills (California Clothing Company) in 1952.
- Head Quarter — New York, USA
- First winner of Miss Universe — Armi Kuusela of Finland (1952)
- 2023 Miss Universe— Sheynnis Palacios (Nicaragua). 2024 Miss Universe will be host by Mexico in September.
- Miss Universe from India— 1st —Sushmita Sen (1994), 2nd—Lara Dutta (2000), 3rd— Harnaaz Sandhu (2021)

Miss India or Femina Miss India—

- First woman— Pramila (Esther Victoria Abraham in 1947 from Calcutta (WB)
- 2022 Miss India— Sini Shetty (Karnataka)
- 2023 Miss India— Nandini Gupta (Kota, Rajasthan)
- Headquarter of Femina Miss India is located at — Mumbai
- **Note:** - Miss International Beauty is Tokyo (Japan) based beauty pageant from 1960
- Miss Earth is annual international environmental-themed beauty pageant based on Philippines from 2001.

Old Names of Famous Places—

New Name	Old Name	New Name	Old Name
France	Gaul	Ghana	Gold Coast
Taiwan	Formosa	Iran	Persia
Egypt	Kemet	Bangladesh	East Pakistan
Iraq	Mesopotamia	Japan	Nippon or Nihon
Tokyo	Edo	Istanbul	Constantinople
Beijing	Peking	Zimbabwe	Rhodesia
Myanmar	Burma	Sri Lanka	Ceylon
Thailand	Siam	Zaire	Congo
Madagascar	Malagasy	Netherlands	Holland

Famous Car Brand's Companies of Different Countries—

Company	From	Company	From
Tesla (Elon Musk), Ford, Harley-Davidson's, Hummer, Jeep, Chevrolet	USA	Rolls-Royce, Range Rover, Bentley, Royal Enfield	UK
Mercedes-Benz, BMW, Audi, Volkswagen, Porsche	Germany	Ferrari, Lamborghini, Ducati, Fiat	Italy
Toyota, Honda, Suzuki, Nissan, Lexus	Japan	Hyundai, KIA	South Korea
Limousine, Bugatti, Renault	France	Volvo	Sweden
Skoda	Czech Republic	Force, Mahindra, Maruti, Tata, Eicher	India

Famous Brands of Different Countries—

Company	Origin From	Company	Origin From
Adidas, Puma	Germany	Nike	USA
Reebok	United Kingdom	Fila, Armani	Italy
Rado Watch	Switzerland	Louis Vuitton	Switzerland

Famous Mobile and Laptop Brands of Different Countries—

Company	Origin From	Company	Origin From
Black Berry	Canada	Vodafone	UK
Oppo, Vivo, One Plus, BBK, Realme, Lenovo, ZTE, Huawei, Haier, Mi, Xiaomi, Redmi, Honor, Tecno, Poco	China	Karbons, Lava, Micromax, Videocon, Onida, Reliance, Intex, HCL, Spice, LYF, JIO, Airtel	India
Panasonic, Sony, Toshiba, Hitachi, Casio	Japan	Philips	Netherlands
Samsung, Lucky Goldstar (LG)	South Korea	Acer, Asus, BenQ, Gigabyte, HTC	Taiwan
Amazon, Apple, Google, Nexus, Microsoft, Motorola, HP (Hewlett-Packard), Dell	USA	Nokia	Finland

Institutes and Research Centre's—

- Indian Agricultural Research Institute— Pusa, New Delhi
- Central Potato Research Institute— Shimla
- National Institute of Virology— Pune
- National Police Academy — Hyderabad
- National Museum — New Delhi
- Indian Space Research Organization— Bengaluru
- Indian Military Academy — Dehradun
- National Institute of Oceanography— Panaji
- National Defence Academy — Khadakwasla, Pune
- Citrus Fruit and Cotton Research Institute— Nagpur, MH
- National Archives of India — New Delhi
- Central Horticulture Research Institute— Bengaluru
- Indian Institute of Science — Bengaluru
- Central Pulses Research Institute— Kanpur

- Tata Institute of Fundamental Research — Mumbai
- Central Leather Research Institute — Chennai
- Satyajit Ray Film and Television Institute of India — Kolkata
- Central Institute of Mines — Dhanbad
- National Dairy Research Institute — Karnal
- Central Wheat and Barley Research Institute— Karnal
- National Petroleum Institute — Dehradun
- Netaji Subhash National Institute of Sports— Patiala
- Indian National Defence University – Gurugram
- Defence Management College – Secunderabad (Telangana)
- National Library of India – Alipore, Kolkata (WB)
- Central Millets and Oilseeds Research Institute— Hyderabad, Telangana
- Survey of India (National Mapping Agency of India)— Dehradun
- Geological Survey of India, Coal India Ltd. — Kolkata
- Film and Television Institute of India — Pune
- Central Rice Research Institute — Cuttack
- Uranium Corporation of India— Jadugoda, Jharkhand
- Nuclear Power Corporation of India — Mumbai
- Sugar Research Institute — Kanpur
- Forest Research Institute — Dehradun
- NTPC, ONGC, SAIL, BHEL, IOCL, GAIL— New Delhi
- Defence Services Staff College — Wellington (TN)
- Millets Experience Centre (MEC) — New Delhi

Famous Abbreviations –

- **BCG** – Bacillus Calmette Guerin
- **ANI** – Asian News International (Indian Official News Agency)
- **AIIMS** – All India Institute of Medical Sciences
- **BPL** – Below Poverty Line
- **DPT** – Diphtheria Pertussis Tetanus
- **CBI** – Central Bureau of Investigation
- **ORS** – Oral Rehydration Solution
- **FDI** – Foreign Direct Investment
- **GDP** – Gross Domestic Product
- **RTI** – Right To Information (12 October 2005)
- **VAT** – Value Added Tax
- **NATO** – North Atlantic Treaty Organisation (1949)
- **NRI** – Non-Resident Indian
- **PIN** – Postal Index Number (6 digit)
- **PTI** – Press Trust of India, Physical Training Instructor
- **SEBI** – Securities and Exchange Board of India
- **VIP** – Very Important Person
- **NCRB** – National Crime Records Bureau
- **MGNREGA** – Mahatma Gandhi National Rural Employment Guarantee Act
- **NABARD** – National Bank for Agriculture and Rural Development (For Farmers)
- **NCERT** – National Council of Educational Research and Training
- **UNICEF** – United Nations International Children’s Emergency Fund
- **AIR** – All India Radio, All India Rank
- **ATM** – Automated Teller Machine
- **BBC** – British Broadcasting Corporation
- **CBSE** – Central Board of Secondary Education
- **ECG** – Electro Cardiogram
- **DDT** – Dichloro Diphenyl Trichloro-Ethane
- **PAN** – Permanent Account Number (of Income-Tax)
- **PWD** – Public Works Department
- **RIP** – Rest In Peace
- **HMT** – Hindustan Machine Tools
- **LIC** – Life Insurance Corporation (of India)
- **NGO** – Non-Governmental Organization
- **OIL** – Oil India Limited
- **PCS** – Provincial Civil Services
- **PTO** – Please Turn Over (for Pages and Papers)
- **UFO** – Unidentified Flying Object
- **SCUBA** – Self-Contained Underwater Breathing Apparatus

National Emblems of Countries—

Australia — Kangaroo	Italy — White Lily
Bangladesh — Water Lily	France — Gallic Rooster
Japan — Chrysanthemum or Red Sun Disk	Turkey, Pakistan — Crescent and Star
New Zealand — Kiwi	USA — Bald Eagle, Golden Rod
Russia — Golden Two Headed Eagle with Red Background	China — Fire Dragon
Nepal — Rhododendron Blossom	Sri Lanka — Lion and Sword
Canada — Maple Leaf	Thailand — Garuda (Khrut)

National Identity Elements or National Symbols of India —

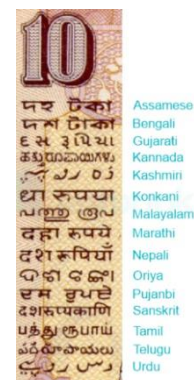
- **National Emblem — Lion Capital of Ashoka**

- It was taken from Sarnath Iron Pillar (Near Varanasi, UP), it has 4 Lions, 1 Elephant, 1 Bull, 1 Horse, 1 Lion on Base Strip and a Wheel (Total- 8 Animals).
- Dinanath Bhargava sketched and illuminated India's National Emblem
- **National Motto or National Slogan— Satyamev Jayate (Devanagari Script)**
- Satyamev Jayate is taken from Mundaka Upanishad meaning 'Truth Alone Triumphs'
- **National Anthem — Jana-Gana-Mana**
- It was composed by Rabindranath Tagore (in Bengali) in Geetanjali book.
- It was first sung on 27 December 1911 at Calcutta Session (Bishan Narayan Dhar).
- It takes 52 seconds to sing.
- Govind Nihalani first directed the video on Indian National Anthem in sign Language
- **National song — Vande Mataram**
- Vande Mataram was written by Bankim Chandra Chatterjee (in Sanskrit) in Anand Math Book
- It was first sung in 1896 at Calcutta Session (Rahimtullah M. Sayani)
- Vande Mataram was the main song during independence struggle.
- Sanyasi Rebellion (Fakir Revolt) is mentioned in Anand Math Book (1882)
- Jana Gana Mana and Vande Mataram was adopted on 24 January 1950.
- **National Flag — Tricolor (Tiranga)**
- It was designed by Pingali Venkayya in 1931 at Karachi (Pakistan).
- Saffron Color is for Strength, Courage and Sacrifice.
- White Color indicates Peace and Truth.
- Green Color for Growth, Fertility and Prosperity.
- Navy Blue Wheel (Dharma chakra) has 24 Spokes, shows Progress. Dharma chakra is also known as "wheel of the law".
- Tricolor was adopted on 22 July 1947.
- Ratio of Length to Width is— 3:2
- **National Animal — Royal Bengal Tiger (Panthera Tigris), Adopted in 1973**
- **National Bird — Peacock (Pavo Cristates), Adopted in 1963**
- **National Calendar— Shaka Era, Adopted on 22 March 1957**
- Shaka Era was started by King Kanishka of Kushana Dynasty in 78 AD.
- Hindu months in order- Chaitra, Baisakh, Jestha, Ashadh, Srawan, Bhadrapada, Aswini, Kartik, Margasheesh, Paush, Magh and Falgun. **Chaitra** is the first month of Shaka Calendar
- 1st Day in Shaka Calendar is 22 March in a Normal Year and 21 March in a Leap Year.
- Vikarmi Samvat started in 57 BC. It is also known as Hindu lunar calendar.
- Vikarmi Samvat or Calender is the official/ National Calender of Nepal.
- **National River — Ganga, Adopted in 2008**
- **National Aquatic animal — Gangetic Dolphin, Adopted in 2010.** It is also known as "Tiger of the Ganges"
- **National Fruit — Mango (Mangifera Indica), also known as King of Fruits**
- **National Flower — Lotus (Nelumbo Nucifera Gaertn)**
- **National Tree — Banyan (Ficus bengalensis)**
- Mango, Lotus and Banyan were adopted on 26 January 1950
- **National Natural Heritage animal — Elephant (Elephas Maximus Indicus)**
- **National Festival (3)— 26 January (Republic Day), 15 August (Independence Day), 2 October (Gandhiji Birthday)**
- **National Currency Symbol — ₹ (Amalgam of Devanagari- र and the Roman Capital- R)**
- It was designed by D. Udaya Kumar (IIT, Bombay Student)

- Currency Symbol (₹) was adopted on 15 July 2010.
- **National Reptile — King Cobra**
- **National Micro Organism — *Delbrueckii Lactobacillus***
- **Official Language — Hindi and English**
- **National Script — Devanagari**
- **National Gazette or National Document or Legal Document— White Paper**
- **National Sweet— Jalebi or Sweetmeat.**
- Jalebi is deep-fried, dipped in sugar syrup, round shaped and usually orange in colour.
- **National Vegetable— Pumpkin**
- **National Sports— Field Hockey**
- **National Foreign Policy— Non-Aligned (Guta Nirpex)**

Currency and Banking system of India —

- The Reserve Bank of India (RBI) is the central bank of the country. RBI headquarters located in Mumbai (Maharashtra).
- RBI founded in 1935 and RBI nationalized on – 1st January 1949. RBI accounting year is from 1 July to 30 June.
- RBI first Governor was Sir Osborne Smith. Current Governor is Shakti Kant Das (25th).
- The Reserve Bank of India (RBI) has sole right to issue (print) banknotes in India. RBI is also known as Banker's Bank.
- Currency Notes printing press are located at Dewas (MP), Nasik (MH), Mysore (Karnataka) and Salboni (West Bengal).
- Oldest printing press of notes is Nasik printing press from 1928.
- Four Mints (coins) press are Kolkata, Hyderabad, Mumbai, Noida
- Largest Public Sector (Commercial) Bank of India – State Bank of India (1955). Nationalization of Banks started in –1969.
- Housing Development Finance Corporation (HDFC) Bank is largest Private Sector Bank of India from 1994.
- National Currency Symbol — ₹. Designed by D. Udaya Kumar on 15 July 2010
- The first banknote of independent India was Rs 1 note print in 1949.
- First times Ashoka Pillar Banknotes print in India in 1949.
- Ashoka Pillar Banknotes replaced by Mahatma Gandhi (MG) Series Notes in 1996.
- MG Series of 1996 replaced by new MG series notes in 2005 with more security. Rs 500 and Rs 1000 notes of this series were withdrawn on 8 November 2016.
- Mahatma Gandhi series new notes was introduced in 2016. Rs 2000 new note was introduced (closed from 01 April 2024)
- Contemporary currency notes have 15 languages on panel which appears on back side of note. Apart this Hindi, English and Numeric also used in our notes.
- First Bank of India – Bank of Hindustan (1770).
- NABARD (National Bank for Agriculture and Rural Development) first Agricultural bank of India (1982).



- **₹10 Note** : Konark Sun Temple (Odisha)
- **₹50 Note** : Hampi, Karnataka
- **₹200 Note** : Sanchi Stupa, Madhya Pradesh
- **₹2000 Note** : Mangalyaan.
- **₹20 Note** : Ellora Caves, Maharashtra
- **₹100 Note** : Rani ki Vav (stepwell or Bawdi), Gujarat
- **₹500 Note** : Red Fort, Delhi

Major Religions of the World—

Christianity— (Largest Followers in the World)

- Most popular religion of the world (Approx. 2.4 billion or 32% of world Population)
- Founded by Jesus Christ.
- Jesus Christ was born in Bethlehem, Jerusalem (Israel).
- Jesus Christ birthday — 25 December - Christmas Day.
- Christianity sects — Roman Catholic, Eastern Orthodox and Protestant.
- Largest church — St. Peter's Basilica, Vatican City, Europe

- Largest church in India — Saint Cathedral Church, Goa
- Holy book — Bible (Old and New Testaments)
- Original language of Bible — Hebrew
- Cross is the religious symbol of Christianity.
- Highest religious leader - Pope.
- Worship Place of Christian is Church

Islam (2nd Largest) — (1.91 Billion, 25% Approx.)

- Founded by Prophet Mohammad (570 AD- 632 AD) in 7th Century AD.
- He was born in Mecca (Hejaz region, Saudi Arabia)
- Successor of Prophet Mohammad is known as Caliph or Khalifa
- India has world's 3rd most Muslim population (While Indonesia—First & Pakistan—Second)
- Islamic Calendar — Hijri Calendar (622 AD).
- Sacred Book — Quran in Arabic Language
- Hadith, Izma and Qayas are another Sacred Book and Texts.
- Largest mosque — Masjid al Haram, Mecca.
- Islamic sects — Shia, Sunni, Ahmadiya, Faraizi
- 1st Muslim invader on India was Muhammad Bin Qasim (712 AD)
- 1st Muslim Empire/ Dynasty was established in India was Delhi Sultanate.

Hinduism (3rd Largest)— (1.25 billion, 16%)

- Oldest surviving religion of the world and the only Religion not have any Founder
- Also known as Sanatana Dharma, Worship Place— Temple (Mandir)
- Four Vedas — Rigveda, Yajurveda, Samaveda and Atharvaveda.
- Rigveda is the oldest (collection of 10600 verses and 1028 hymns and 10 Mandal or Parts)
- Hindu Purana — 18 (oldest Matsya Purana and Skanda Purana is largest), Samskaras— 16
- Upanishad — 108, Philosophy or Darshans — Shad-Darshans (6 Darshans)
- Epics — Ramayana (by Adi Kavi Valmiki) and Mahabharata (by Ved Vyas).
- Incarnations (Avatar) of Lord Vishnu— 10 (First —Matsya, 9th— Buddha, Last —Kalki)
- Kalki will be born near Himalaya reign in Shambhala Village.
- Manu smriti is the ancient law book.
- Hindu New Year – Shaka Samvat, 1st day of Chaitra i.e., 22 or 21 March.
- Four Sects of Hinduism– Vaishnavism, Shaivism, Shaktism and Smartism (based of Purana Teachings)
- Largest Hindu Temple – Angkor Wat, Cambodia (also largest religious monument in the world)
- Largest Hindu Temple (Modern Era) – BAPS Swaminarayan Akshardham, Robbinsville Township in New Jersey (USA)
- Amarnath (Pahalgam, J&K) is famous for Snow Shivaling

Buddhism (4th Largest)— (507 million, 5.06%)

- Founded by Gautama Buddha. He belongs to the Shakya Clan.
- Gautam Buddha's Original, Real Name was Siddharth.
- Other titles of Siddharth were — Shakya Muni, Buddha, Tathagata, Awakened One.
- He was born in Lumbini (Nepal) in 563 BC.
- He was the Prince of Kapilvastu (Nepal).
- Family of Buddha: - Father- Shuddhodhana, Mother- Mahamaya, Foster Mother- Mahaprajapati Gautami,
- Wife- Yashodhara, Son- Rahul,
- He left home or Renunciation at 29 (Mahabhiniskarmana)
- He got enlightened (Nirvana) at Bodhgaya (Bihar) under a Peepal Tree (Now Bodhi Tree).
- First Sermon — Sarnath (Near Varanasi, UP) (Dharmachakra Parivartana)
- He died in Kushinagar in 483 BC (Mahaparinirvana).
- Buddha was contemporary of Bimbisara of Magadha, Prasanjit of Kosala, Udayan of Vatsa and Mahavira.
- Worship Place— Buddhist Monastery (Including Stupa, Chaitya and Vihara)
- Three sects of Buddhism — Hinayana, Mahayana, Vajrayana.

- Three books (Tripitaka) — Sutta Pitaka, Vinay Pitaka and Abhidhamma Pitaka,
- Buddhist Literature Language— Pali.
- The holiest festival of Buddhism is **Vaishakh Purnima** it is also known as **Buddha Purnima**.
- Buddha Charita written by Ashvagosh in time period of Kanishka.
- Dhamma — Teachings of Buddha.
- Jataka Tales related with former lives of Buddha.
- Painting and Sculptures of the Ajanta Caves related with Buddha's Jataka Tales.
- Sanchi Stupa (MP) is a Buddhist monument constructed by Ashoka.
- Largest Buddhist Temple (Monastery) — Borobudur in Indonesia
- Largest Buddhist Temple (Monastery) in India — Tawang (Arunachal Pradesh)

Jainism —

- Founder — Rishabdeva or Adinath (1st Tirthankara)
- Total Tirthankaras — 24.
- 24th and Last — Vardhaman Mahavira (Also known as Real Founder of Jainism)
- Mahavir was born in Kundagram (Vaishali Distt, Bihar) in 540 BC
- Died (Salvation Place) in Pavapuri (Modern Rajgir, Bihar) in 468 BC.
- Family of Mahavira: - Father- Siddhartha, Mother- Trishala (A Licchavi Princess, Sister of Chetaka), Wife- Yashoda,
- Place of Worship— Basadi (Derasar)
- Jainism has two sects — Digambar (No Cloth) and Svetambara (White Cloth).
- Dilawara Jain Temple located at Mount Abu (Aravalli Hills of Rajasthan)

Sikhism —

- Founder - Guru Nanak Dev (1469-1539), Father Name: Mehta Kalu, Mother Name: Tripta Devi. Contemporary of Babur
- Guru Nanak Dev born in Talwandi (Now Nankana Sahib, Near Lahore, Pakistan)
- Nanak Dev started Langar System (Free Kitchen).
- Kartarpur Corridor Connect Gurdaspur (Punjab) to Pakistan, death place of Nanak Dev
- Guru Angad Dev founded the Gurmukhi Script.
- Total Gurus — 10, Sikh Means— Disciple or Learner
- List of Sikh Guru's in order— Guru Nanak Dev, Guru Angad Dev, Guru Amar Das, Guru Ram Das, Guru Arjun Dev, Guru Har Gobind, Guru Har Rai, Guru Har Krishan, Guru Tegh Bahadur and Guru Gobind Singh.
- Guru Gobind Singh was son of Guru Tegh Bahadur.
- Guru Ramdas founded the city of Amritsar.
- Golden temple (Harmandir Sahib) was constructed by Arjun Dev. Operation Blue Star start by Indian Army to remove Sikh militant Jarnail Singh Bhindranwala in 1984. PM that time- Indira Gandhi.
- Arjun Dev compiled Guru Granth Sahib, Sikh's sacred book.
- Arjun Dev was executed by Jahangir on May 30th, 1606. He is also known as first martyr of Sikh Panth (Shahidan De Sartaa)
- Guru Har Gobind (6th guru) turns Sikhs in a warrior clan (Soldier Saint).
- Guru Har Gobind founded the Akal Takht Sahib (the seat of the Divine Power)
- Ninth Guru — Tegh Bahadur, executed by Aurangzeb. Shaheedi Diwas or Martyrdom Day of 'Guru Tegh Bahadur' observed in November month every year.
- Sheeshganj Gurudwara, Delhi is a memorial of Tegh Bahadur built by Baghel Singh (1783)
- Guru Tegh Bahadur founded Anandpur Sahib (Punjab)
- Last Guru - Gobind Singh.
- Gobind Singh was born in Patna sahib.
- He introduced Khalsa Panth and five K's (Kangha, Kesh, Kada, Kripaan and Kachera)
- He also introduced Kaur for Females and Singh for Males surname for their followers.
- Gobind Singh declared Guru Granth Sahib as the Future Guru or 11th Guru or Last Guru

Zoroastrian or Mazdayasna—

- Also known as Parsi Religion
- Founder — Zoroaster in Persia (Modern Day Iran).

- Holy Book — Zend Avesta (Gatha) in Avestan (Eastern Iranian Language)
- Parsi worships Fire God and Fire Temple.
- Fire along with water is seen as symbols of purity in Zoroastrian Religion.
- Parsi lives mostly in Mumbai, Maharashtra and Gujarat.
- Festival— Navroj (New Year)
- God —Ahur
- Zoroastrians give their dead person to "Sky burials". They built circular, flat-topped towers called Dakhmas or Towers of Silence.
- The Faravahar is religious symbol of Zoroastrian.

Judaism—

- Also known as Jewish or Yahudi Dharma
- Founder — Abraham (Hebrew Man)
- Palestine (Israel) is known as land of Jewish.
- Holy Book — Tanakh and Talmud
- Language— Hebrew.
- Hitler killed thousands of Jewish during World War-II.
- Religious Symbol of Judaism is known as — The Star of David (The Magen David)
- Worship Place of Judaism is Synagogue
- The Wailing Wall (Western Wall) or Kotel is related with Jewish in Jerusalem (Israel).
- Judaism is mainly found in Keralam and Maharashtra.
- **Note** — Jerusalem is a holy place for Islam, Christianity and Judaism.
- "Al-Aqsa Mosque", which is Islam's 3rd holiest site after Mecca and Medina.
- "Church of the Holy Sepulcher" site of Jesus Christ's Resurrection.
- "The Temple Mount" or Western Wall of the Biblical temple

Baha'i religion—

- Founder Mirza Husayn 'Ali Nuri (1817–1892) also known as Baha'u'llah born in Tehran
- Newest religion of the world.
- Baha'i religion founded in 1844 in Persia (Iran)
- Icon or Logo — Nine-Pointed Star
- Holy Book — The Kitáb-i-Aqdas (Arabic Language)
- Holy Place — The Shrine of the Báb, Haifa (Israel)
- Lotus temple (1986) of Delhi is related to Baha'i religion. It is also the only Baha'i religion temple that lies in Asia.

Classical Dances of India—

- There are **8 Classical Dances** in India.
- Father of Modern Dance or Father of Classical Dance in India—Uday Shankar (Fusion Dancer)

Bharatanatyam—

- Originate in Tanjore (Tamil Nadu). Also known as Fire Dance.
- Solo Dance. Bharatanatyam is purest form of Classical Dance.
- It is the National classical dance of India.
- Dance themes are taken from Ramayana and Mahabharata

Kathakali (Keralam) —

- Based on Indian Epics
- Performed mainly by Males.
- Paint Applied on the Face of the Artist. Also used a Huge Head Gear

Kuchipuri —

- This dance was conceived by Siddhendra Yogi (A Vaishnava Poet)
- Got name from Kuchelapuram Village in Krishna District of Andhra Pradesh
- Themes — Bhagwat Purana.
- A Brass Plate and A Pot on Head is use in this dance.

Kathak (Uttar Pradesh) —

- Kathak is Story Telling Dance. Originated in Bhakti Movement.
- It is influenced by God Krishna's Raslila. Also known as Natwati Dance.
- Mainly observed in Uttar Pradesh and North India.
- Wajid Ali Shah, nawab of Awadh was the patron of Kathak.
- Birju Maharaj was a famous Kathak dancer.

Odishi—

- Dance theme is taken from Radha and Krishna love.
- It is origin to the Temple Dances of the Devdasi's called Maharis in Jagannath Puri Temple.
- Jain King Kharvela patronized Odishi Dance.
- Udayagiri and Khandgiri caves (both in Odisha) related to Odishi Dance.

Manipuri—

- Father of Manipuri Dance- Guru Bipin
- Kumil Costume dress is mainly used in this dance.
- Lai Haraoba dance is the base of Manipuri Dance.

Sattriya, Assam—

- First introduces in 15th Century by a Bhakti Poet Shankra Dev (1449-1586)

Mohiniattam, Kerala—

- Also known as dance of Mohini (an Incarnation of Lord Vishnu) and Bhasmasur.
- Mohiniattam is performed only by women
- The dance is influenced by Bharatanatyam and Kathakali.

Folk Dances of India —

- | | |
|--|---|
| • Telangana —Bathukamma, Dandari-Gussadi | • Assam —Bihu, Husari or Husori |
| • Odisha —Changu | • Maharashtra —Tamasha, Lavani |
| • Gujarat —Garba, Dandiya, Raas | • Haryana —Dhamal |
| • Himachal Pradesh —Kullu Nati, Jhora, Pungi | • Jammu & Kashmir —Rauf |
| • Karnataka —Yaksha Gana, Karga | • Keralam —Ottam Thullal, Koodiyattam, Theyyam |
| • Punjab —Bhangra (Crop harvest time), Gidda, Gatka | • Rajasthan —Ghoomar, Kalbelia |
| • Andhra Pradesh —Kollatam | • Madhya Pradesh —Matki |
| • Goa —Mando, Fugdi | • Tamil Nadu —Kavadi, Karagam |
| • Uttar Pradesh —Nautanki, Kajri, Raslila | • Uttarakhand —Gharwali, Kumaon, Hudkeli |
| • Meghalaya —Loho | • Mizoram —Bamboo dance or Cheraw |
| • Jharkhand —Chhou | • Sikkim — Singhi (Singlis) Chham, Loin Dance |

Famous Dance, Music and Cultural Personalities—

Kathak	Birju Maharaj, Lady Leela Sokhey (Menaka), Shobna Narayan
Bharatnatyam	Mrinalini Sarabhai, E. Krishna Iyer, Rukmini Devi Arundale, Bala Sarasvati
Kathakali	Ramankutty Nair, Kalamandalam Gopi
Kuchipuri	Yamini Krishnamurthy, Raja Reddy, Guru Vempati Chenna Satyam
Mohiniattam	Sunanda Nair, Pallavi Krishnan
Manipuri	Guru Bipin Singh
Odishi	Sonal Mansingh, Kelucharan Mahapatra
Music	MS Subbalaxmi, Girija Devi, Bhimsen Joshi, Malini Avasthi
Hindustani Music	Pandit Jasraj, Tansen
Folk Dancer	Teejan Bai
Painter	MF Hussain, Raja Ravi Verma

Note: — Dhrupad, Thumri, Khayal, Tarana, Tappa, Ghazal are major styles of Hindustani Music.

Musical Instruments and their players—

Rudra Veena	Asad Ali Khan, Ustaad Sadik Ali Khan
Sarangi	Pt. Ram Narayan
Sitar	Pt. Ravi Shankar. Vande Hasan, Vilayat Khan
Veena	S. Balachandran, Krishan Bhagvtar
Guitar	Braj Bhushan Kabra
Sarod	Amjad Ali Khan, Buddhdev Das Gupta
Ghatam	T H Vinayakarm
Violin	TN Krishnan, Zubin Mehta, L. Shubramanyam
Mridangam	Karaikudi R Mani
Santoor	Shiv Kumar Sharma, Bhajan Sopari
Flute	Hariprasad Chaurasia, Pannalal Ghosh, V. Kunjamani & Neela (Sikkil Sisters)
Shehnai	Bismillah Khan (The Shehnai Maestro), Ali Ahmad
Tabla	Zakir Hussain
Pakhawaj	Totaram Sharma, Nishaant Singh, Pandit Chanchal Kumar Bhattacharya
Mohan Veena	Pandit Vishwa Mohan Bhatt

Famous Festivals of India—

- **Chapcharkut**—Mizoram
- **Kambala (Buffalo Race), Bhuta Kola**—Karnataka
- **Chatth Pooja, Bihula**—Bihar
- **Durga Puja**—West Bengal
- **Flamingo**—Andhra Pradesh
- **Ganesh Chaturthi**—Maharashtra
- **Pongal, Aadiperrakku, Thaisoopam**—Tamil Nadu
- **Onam (Sravana Month), Thissur Pooram**—Keralam
- **Kharchi Puja**—Tripura
- **Bonalu, Bathkumbha**—Telangana
- **Lohri, Baisakhi**—Punjab
- **Hornbill, Moatsu, Aoling**—Nagaland
- **Navratri, Kutch Utsav**—Gujarat
- **Gangaur, Bundi**—Rajasthan
- **Bihu, Ambubachi**—Assam
- **Jallikattu (Bull-taming event)**—Tamil Nadu (in Jan. During Pongal)
- **Rath Yatra (Jagannath Temple)**—Odisha
- **Hemis, Losar**—Ladakh

Note: Yugadi (Karnataka), Gudi Padwa (MH), Navreh (J&K) are festivals of the spring season mark the beginning of the **traditional New Year in India**. **Thaisoopam** is celebrated by Tamil Hindu Community.

Famous Food / Dishes of Indian states—

- **Bihar** – Litti Chokha
- **Gujarat** – Dhokla
- **Punjab** – Makki di Roti & Sarso da Saag
- **Haryana** – Bajre ki Khichdi and Bajre ki Roti
- **J&K** – Rogan Josh (Ghosht), Yakhni (Non-Vegetarian Dish)
- **Tamil Nadu** – Idli, Dosa, Utpam, Sambhar, Pongal
- **West Bengal** – Rasgulla and Kosha Mangsho
- **Sikkim** – Momo's
- **Rajasthan** – Dal Baati Churma
- **Mumbai** – Vada Pav or Misal Pav
- **Keralam** – Appam
- **Hyderabad (Telan.)** – Biryani
- **Uttarakhand** – Kafuli

Famous Handlooms of Indian states—

- National Handloom Day is celebrating on 7 August
- A method of painting with natural dyes on cotton or silk cloth with a bamboo stick is called Kalamkari
- **Pashmina Shawl** —Jammu and Kashmir
- **Bandhani**—Rajasthan
- **Kalamkari**—Andhra Pradesh
- **Chanderi**—Madhya Pradesh
- **Jamdani**—West Bengal
- **Kasavu**—Keralam
- **Phulkari**—Punjab
- **Chikankari**—Uttar Pradesh
- **Apatani**—Arunachal Pradesh
- **Shisha**—Rajasthan
- **Kosa Silk**—Chhattisgarh
- **Paithani**—Maharashtra

Famous Dress Around the World—

- **Huipil**—Mexico
- **Coiffe**—France
- **Kilts**—Scotland
- **Sari**—India
- **Kimono**—Japan
- **Kebaya**—Indonesia
- **Pollera**—Panama
- **Abaya & Thobe**—Qatar
- **Maasai Shuka**—Kenya

- **Gho**—Bhutan
- **Conical Hat**—Vietnam

Famous Dance around the world—

Note: International Dance Day is Celebrated on 29 April from 1982.

- **Waltz**—Austria
- **Ballet**—Russia
- **Flamenco**—Spain
- **Break Dance, Hip-Hop**—USA
- **Belly Dance**—Middle east
- **Step Dance**—Ireland
- **Haka**—New Zealand
- **Tango**—Argentina
- **Kabuki**—Japan
- **Salsa**—Cuba
- **Samba**—Brazil

First in the World—

Males—

First Chairman of Peoples Republic of China	Mao-Tse-Tung
First President of the Republic of China	Sun Yat Sen
First Secretary-General of United Nations	Trygve Lie (Norway)
First President of United States of America	George Washington
First U.S. President to resign Presidency	Richard Nixon (1974)
First Chinese Traveler to visit India	Fa-Hein
First man to go into space	Yuri Gagarin
First man to walk in space	Alexey Leonov
First Space Tourist	Denis Tito (2001)
First man to have climbed Mount Everest twice	Nawang Gombu Sherpa (Tibet and India)
First Blind man to scale Mt. Everest	Erik Weiheymayer (USA, 2001)
First man to set foot on the Moon	Neil Armstrong and Edwin E. Aldrin
First youngest grandmaster of the world in chess	Sergey Karjakin (Ukraine)
First man to fly an Aero Plane	Wright Brothers (Orville and Wilbur)
First man to reach North pole	Robert Peary (1909)
First man to reach South pole	Roald Amundsen (1911)
first double amputee to scale Mt. Everest	Mark Inglis (New Zealand)
First man to climb Mount Everest	Edmund Hillary, Tenzing Norway (1953)
First person to sail around the world	Ferdinand Magellan
First European to visit China	Marco Polo

Females—

First woman President of UN General Assembly	Vijay Laxmi Pandit (UP, India)
First woman to Command a Space Mission	Eileen Collins (USA)
First woman President of a country	Maria Estela Peron (Argentina)
First Muslim Prime Minister of a country	Benazir Bhutto (Pakistan)
First woman Prime Minister of a country	Sirimavo Bhandarnayke (Sri Lanka)
First woman to receive Nobel Prize	Madam Curie (1903)
First Muslim woman to receive Nobel Prize	Shirin Ebadi, Iran (2003)
First woman Prime Minister of England	Margret Thatcher
First woman cosmonaut in space	Valentina Tereshkova
First woman Chancellor of Germany	Angela Merkel
first woman to swim seven seas/ five continents	Bula Chaudhury (India)
First woman to reach Antarctica	Caroline Mikkelsen (1935)
First woman to climb Mount Everest	Junko Tabei (1963)
First female Amputee to climb Mount Everest	Arunima Sinha

First in India—

Males—

First man in space	Rakesh Sharma
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First to pass the examination of the Indian Medical Service (IMS)	Surjo Kumar Chakroborty
First Indian and Asian to get Nobel Prize	Rabinder Nath Tagore
First Indian to get Nobel Prize in Physics	CV RAMAN
First President of India	Dr. Rajender Prasad
First Vice-President of India	Sarvepalli Radhakrishnan
First Chinese Traveler to visit India	Fa-Hein
First President of Indian National Congress	Womesh Chandra Banerjee
First Prime Minister of India	Pt. Jawahar Lal Nehru
First Deputy-Prime Minister of India	Sardar Vallabh Bhai Patel
First Home Minister of India	Sardar Vallabh Bhai Patel
First Chief Election Commissioner of India	Sukumar Sen
First Governor-General of India	Lord William Bentick
First Viceroy of India	Lord Canning
First Chief Justice of India	Hiralal J. Kania
First Speaker of Lok Sabha	Ganesh Vasudev Mavlankar
First Chairperson of Lokpal of India	Justice Pinaki Chandra Ghosh
First Defence Minister of India	Sardar Baldev Singh
First Commander-in-Chief of Free India	K. M. Cariappa
First Field Marshal	Sam Manekshaw
First Man to go into space	Rakesh Sharma
First Individual Gold Medal in Olympic won by	Abhinav Bindra
First British to visit India	John Mildenhall (1599)
First Indian to reach Antarctica	Lt. Ram Charan (1960)
First Indian Judge in International Court of Justice	Nagendra Singh
First Wax statue of a Living Indian -	Mahatma Gandhi (at Madame Tussaud Museum, London)
First Indian Pilot	JRD Tata (1929)
First Indian to cross English Channel	Mihir Sen (1958)
First Indian to join the Indian Civil Services (ICS)	Satyendra Nath Tagore (1863)
First Indian to reach Mount. Everest	Lt Col Avatar Singh Cheema (1965)

Females—

First woman President of UN General Assembly	Vijay Laxmi Pandit (UP, India)
First woman in Space	Kalpana Chawla
First female jawan in the army	Shanti Tigga
First and only woman Prime Minister of India	Indira Gandhi
First woman to won Bharat Ratna	Indira Gandhi
First Indian woman to receive Nobel Prize	Mother Terrasa
First Female Pilot	Sarla Thakral
First female combat pilot	Avani Chaturvedi
First women to get Sword of Honor	Captain Divya Ajith Kumar
First Indian woman to participate in Olympics	Nilima Ghose
First Woman to Win an Olympic Silver Medal	PV Sindhu
First Woman to Win two Olympic Medal in one Olympic	Manu Bhakar (Paris Olympic-2024)
First woman to swim seven seas/ five continents	Bula Chaudhury
First Indian woman to cross English Channel	Arati Saha
First female Chief Election Commissioner	V.S. Ramadevi (1990)
First woman to climb Mount Everest	Bachendri Pal (1984)
First Indian woman to climb Mount Everest twice	Santosh Yadav
First Indian lady to become miss world	Reita Faria Powell

First and last Muslim woman ruler of India	Razia Sultana
First female IPS officer	Kiran Bedi (1972)
First female IAS officer	Anna Rajam Mehrotra (1951)
First female UPSC Chairman	Rose Millian Bathew Kharbuli (1992)
First woman Chief Minister of any Indian State	Mrs. Sucheta Kriplani (UP)
First woman Governor of any Indian State	Sarojini Nayadu (UP)
First Indian woman Graduates	Kadambini Ganguly
First woman speaker of a state assembly	Shanno Devi

Places & Countries—

First country to make/ Prepare written Constitution	USA (1789)
First country to send human to Moon	USA
First country to appoint Ombudsman (Lokpal)	Sweden (1809)
First country to ban capital punishment (Hang)	Venezuela
First country to give voting right to woman	New Zealand
First country to impose carbon tax	New Zealand
First country to issue plastic currency	China
First country to issue paper currency	China
First country to print book	China
First country to commence competitive examination	China
First country to start Civil Services Competition	China
country to give constitutional status to animal rights	Australia
First country to extend legal rights to apes	Spain
First country to launch Artificial satellite in the space	USSR (Russia), 1957
country to implement family planning	India
First country to make education compulsory	Prussia (Germany and Austria)
First country to auction Digital Dividend	Germany
First country to sign nuclear agreement with India	France (2008)
First space ship landed on Mars	Viking-I
First space shuttle launched	Columbia
First country to launch satellite into space	USSR
First country to launch radio telescope satellite into space	Japan
First and only city to be attacked with Atom Bomb	Hiroshima (1945)
First country to win the Football World Cup	Uruguay (1930)
First country to host the Modern Olympic Games	Greece
First cloned animal	Dolly Sheep (Scotland in 1996)
First cloned human baby	Eve (2002 in USA)
First Religion of the world	Santana Dharma
First University of the world	Taxila

Geographical Superlatives—

Highest volcano—	Nevados Ojos Del Salado (Chile- Argentina Border), 6879 m
Most Active Volcano—	Kilauea (Hawaii, USA)
Largest volcano—	Mauna Loa (Hawaii)
Largest Bay—	Bay of Bengal, 2nd is Hudson Bay
Longest River—	Nile
Largest River—	Amazon
Largest Gulf—	Gulf of Mexico
Largest Sea—	Philippines Sea
Largest Desert—	Sahara

Largest Delta—	Sundarbans or Ganga-Brahmaputra Delta
Highest Waterfalls—	Salto Angel (Venezuela)
Driest place—	Atacama Desert (South America)
Largest Island—	Greenland (Denmark)
Largest Archipelago—	Indonesia
Wettest / Rainiest place—	Mawsynram (India)
Largest Peninsula—	Arabian, 2nd Indian
Largest lake—	Caspian Sea (5 Countries)
Deepest lake—	Baikal (Russia)
Saltiest lake—	Gaet'ale Pond, Ethiopia
Largest Gorge—	Grand Canyon, USA
Longest Coastline—	Canada
Largest Landlocked Country—	Kazakhstan
Largest number of international boundaries —	China (14 Countries), 2nd Russia (12 Countries)

Geographical Epithet of the World—

Land of Thousand Elephants —	Laos (Also known as Million Elephants)
Land of White Elephant —	Thailand
Blue Mountains	Nilgiri (Due to Neelakurinji Flower)
China's Sorrow —	Hwang Ho River
City Beautiful —	Chandigarh
City of Golden Gate —	San Francisco (USA)
City of Dreaming Spires —	Oxford University (England), Due to Architect
City of Magnificent Buildings —	Washington
City of Seven Hills —	Rome
City of Quiet thoroughfares —	Venice (Italy)
City of Eternal Springs —	Quito (Ecuador)
Cockpit of Europe —	Belgium
Dark Continent —	Africa
Forbidden City —	Lhasa
Windy City —	Chicago (USA)
White City of the World —	Tel-Aviv (Israel)
Land of Golden Pagoda —	Myanmar
Gift of the Nile —	Egypt
Hermit Kingdom —	North Korea
Island Continent —	Australia
Island of Cloves —	Zanzibar (Africa)
Human Equator of the Earth —	Himalayas
City of Skyscrapers, Empire City —	New York (USA)
Key to the Mediterranean —	Gibraltar (Also known as Pillars of Hercules)
Land of Golden Fleece —	Australia
Eternal City of Hopes —	Rome (Italy)
Land of Morning Calm —	South Korea
Land of the Midnight Sun —	Norway (due to very near with North Pole)
Land of the Rising Sun —	Japan
Land of the Thunderbolt —	Bhutan
Land of Thousand Lakes —	Finland
Manchester of Japan —	Osaka
Manchester of India —	Ahmadabad (Gujarat)

Manchester of North India	—	Kanpur (UP)
Manchester of South India	—	Coimbatore (Tamil Nadu)
Pearl of the Antilles	—	Cuba
Island of Pearls	—	Bahrain (Persian Gulf)
Roof of the World	—	The Pamir
Spice Garden of India	—	Keralam
Land of Lilies/ Maple	—	Canada
Gibraltar of Indian Ocean	—	Gulf of Aden
Sugar Bowl of the World	—	Cuba
Play Ground of Europe	—	Switzerland
Granite City of the World	—	Aberdeen (Scotland)
Land of Kangaroo	—	Australia
Lungs of Earth	—	Amazon Forest (Brazil)
Herring Pond	—	Atlantic Ocean (Due to Herring Fish)
Sick men of Europe	—	Turkey
Britain of the South	—	New Zealand
Holy Land	—	Jerusalem (Israel)
Garden in the desert	—	Ethiopia

Sobriquets or Famous Geographical Surnames of India —

Abode of the God	—	Prayagraj (Allahabad)
Queen of Arabian Sea	—	Kochi
City of Rallies	—	New Delhi
Black Pagoda	—	Sun Temple Konark (Odisha)
White Pagoda	—	Jagannath Puri (Yamanika Tirtha), Odisha
Science city, Garden city	—	Bengaluru
Silicon Valley of India, Space City	—	Bengaluru
City of Ghats, Lights, Music	—	Varanasi (84 Ghats)
Pink city	—	Jaipur
City of seven Islands	—	Mumbai
City of lakes	—	Udaipur
Boston of India	—	Ahmadabad (Boston in USA)
Blue city	—	Jodhpur
Coffee land of India	—	Chickmagalur (Karnataka)
Golden city	—	Jaisalmer
City of Palaces/ Buildings/ Joy	—	Kolkata (Also known as City of Castles)
City of Nawabs	—	Lucknow
Deccan Queen	—	Pune
City of Festivals/ Jasmine (White Color)—	—	Madurai (Tamil Nadu)
Queen of Mountain	—	Mussoorie
God's own country	—	Keralam
Venice of the East, City of Peace	—	Kochi
Diamond Harbor	—	Kolkata
Detroit of India, Asia	—	Chennai (Hub of Indian Automobile Industry)
Planned City	—	Chandigarh
Land of Five Rivers	—	Punjab
Diamond City, Silk City	—	Surat

India Superlatives—

❖ Biggest Cave temple in India	Kailash Temple (Cave No. 16), Ellora Caves
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❖ Largest Floating Solar Power Plant in India	Ramagundam in Telangana (Peddapalli district)
❖ Deepest River Valley in India	Bhagirathi and Alaknanda
❖ Densest Populated State in India	Bihar
❖ Highest Airport in India	Kushok Bakula Rimpochhe Airport in Leh
❖ Highest Battlefield in India & World	Siachen Glaciers (Operation Meghdoot by Indian Army in 1984)
❖ Highest Dam in India	Tehri Dam (260.5 m), Bhagirathi River
❖ Highest Gallantry Award in India	Param Vir Chakra
❖ Highest Gateway in India	Buland Darwaza at Fatehpur Sikri
❖ Highest Peak in India	Karakoram-2 of K-2(8,611 meters)
❖ Highest Railway Station in India	Ghum railway station (West Bengal)
❖ Highest Rainfall (State) in India	Mawsynram (Meghalaya)
❖ Highest Motorable Road in India	Chisumle and Demchok which are nearly 230 km from Leh
❖ Highest Tower in India	Qutab Minar at Delhi
❖ Highest Waterfall in India	Kunchikal falls (Karnataka)
❖ Longest Cave in India	Krem Liat Prah, Meghalaya
❖ Largest District in India	Kutch district
❖ Largest Dome in India	Gol Gumbaz at Bijapur
❖ Largest Fresh Water Lake in India	Wular Lake
❖ Largest Gurudwara in India	Golden Temple (Harmandir Sahib), Amritsar
❖ Longest Lake in India	Vembanad Lake, Keralam
❖ Largest Lake (Saline Water) in India	Chilka Lake, Odisha
❖ Biggest Man-Made Lake in India	Govind Ballabh Pant Sagar, Rihand Dam, Sonbhadra District, UP.
❖ Largest Populated City in India	Mumbai
❖ Largest Sea Port	Mumbai (By Size & Shipping Traffic)
❖ Largest Public Sector Bank	State Bank of India
❖ Largest River Island	Majuli (Assam)- 972 km ²
❖ Largest River without Delta	Narmada
❖ Largest Zoo	Sri Venkateswara Zoological Park, Tirupati, Andhra Pradesh
❖ Longest Beach in India	Marina Beach, Chennai
❖ Longest Canal in India	Indira Gandhi Canal or Rajasthan Canal
❖ Longest Cantilever Span bridge	Howrah Bridge or Rabinder Setu, West Bengal
❖ Longest Dam (Earthen)	Hirakud Dam
❖ Longest Highway	NH-44 (previously known as NH-7) from Srinagar to Kanyakumari
❖ Longest Railway Platform	Hubbli Raliway Station (Karnataka) 2 nd Gorakhpur Railway Station
❖ Longest Railway Route	Assam to Kanyakumari (Dibrugarh – Kanyakumari Vivek Express)
❖ Longest River Bridge (Over Water)	Dhola-Sadiya Bridge (Also known as Bhupen-Hazarika Setu) connecting Assam and Arunachal Pradesh. The length is 9.15 km.
❖ Longest River in India	Ganges
❖ Longest Tributary River of India	Yamuna
❖ Longest Tunnel in India (Highway)	Atal tunnel
❖ Largest Area under Forest Cover (State) in India	Madhya Pradesh
❖ State with the longest coastline in India	Gujarat
❖ State with the longest coastline in South India	Andhra Pradesh
❖ Tallest Statue in India	Statue of Unity
❖ The largest animal Fair	Sonpur (Bihar)
❖ The largest Mosque	Jama Masjid (Delhi)
❖ The largest Delta	Sundarbans (W. Bengal)
❖ The longest Tunnel	Pir Panjal tunnel

❖ The longest Corridor	Corridor of Ramanathaswamy Temple of Rameswaram (Tamil Nadu)
❖ The most popular city	Mumbai (Maharashtra)
❖ The Highest Lake	Cholamu lake (North Sikkim)
❖ The longest river of Southern India	Godavari
❖ Largest Cave	Amarnath (J & K)
❖ The biggest Church	Saint Cathedral at old Goa (goa)
❖ The Highest Airport	Leh Airport (Ladakh)

World Superlatives —

Largest City (in population)	Tokyo
Largest Continent	Asia
Smallest Continent	Australia
Largest Country (in population)	India
Largest Country (in area)	Russia
Largest Coral Formation	Great Barrier Reef, Australia
Largest Dam	Three Gorges Dam, China
Longest Day	21 June
Largest Bird	Ostrich
Smallest Bird	Humming Bird
Tallest Building	Burj Khalifa, Dubai, 828 m
Shortest Day	22 December
Deepest Lake	Baikal
Highest Lake	Titicaca (Bolivia)
Largest Delta	Sundarbans
Largest Desert (world)	Sahara, Africa
Largest Diamond	Cullinan, South Africa (621.20 g)
Longest Epic	Mahabharata
Largest Island	Greenland
Largest Lake (Artificial)	Lake Volta, Ghana
Largest Lake (Fresh water)	Superior (North America)
Largest Lake (Salt water)	Caspian Sea, Asia
Largest Mosque	Masjid Al Haram, Mecca
Highest Mountain Peak (world)	Mount Everest
Highest Mountain Range	Himalaya
Longest Mountain Range	Andes, South America
Biggest Museum	British Museum, London
Biggest Indian Museum	The Indian Museum of Kolkata
Tallest Animal (on land)	Giraffe
Biggest Bell	Tsar Bell, Moscow
Fastest Bird	Falcon
Busiest Port	Shanghai, China
Longest Railway	Trans-Siberian, Russia
Longest River	Nile
Longest River Dam	Hirakud
Largest Sea-bird	Albatross
Largest Sea (inland)	Caspian Sea
Brightest Star	Dog star
Tallest Statue	Statue of Unity, India
Largest Volcano	Mauna Loa, Hawaii

longest Wall	Great Wall of China (21000 KM)
Highest Waterfall	Angel falls, Venezuela
Deepest And Biggest Ocean	Pacific Ocean
Largest Park	National Park, Greenland
Largest Peninsula	Arabian
Coldest Place or Region	Vostok, Antarctica
Driest Place	Atacama Desert, South America
Largest Planet	Jupiter
Brightest and Hottest Planet	Venus
Farthest Planet (from the sun)	Neptune
Nearest Planet (to the sun)	Mercury
Smallest Planet	Mercury
Highest Plateau	Qinghai-Tibetan plateau
Longest Platform (Railway)	Hubballi (Karnataka)
Largest Gulf	Gulf of Mexico
Largest Church	St. Peter Basilica, Vatican City
Largest Temple	Angkor vat, Cambodia
Largest Diamond Mine	Kimberley, South Africa
Largest River in Volume	Amazon, South America
Longest Corridor	Rameswaram
Highest Capital City	La Paz, Bolivia
Largest Asian desert	Gobi, Mongolia and China
Largest Democracy	India
Largest Animal of the Cat Family	Tiger
Most Intelligent Animal	Chimpanzee
Bird, that never makes its nest	Cuckoo (Koyal)
Wingless Bird	Kiwi
Reptile which changes its colors	Chameleon
Largest Mammal	Whale
Largest River Basin	Amazon
World's Rainiest spot	Mawsynram, India
Largest Gorge	Grand Canyon, USA
Lightest Gas	Hydrogen
Lightest Metal	Lithium
Highest Melting Point	Tungsten
Hardest Natural Substance	Diamond
Longest Animal	Whale
Longest Life-span of an Animal	Tortoise (250+ Years)
Largest Land Animal	African Elephant
Fastest Animal	Cheetah
Longest jump Animal	Kangaroo
Longest wing spread bird	Albatross (11 feet)
Slowest Animal	Three-toed Sloth (2 nd Snail)
Fastest Dog	Persian Grey Hound
Longest Poisonous Snake	King Cobra
Biggest Flower	Rafflesia Arnoldii (Java)
Smallest Flower	Watermeal or Wolffia globosa

Geographical Discoveries—

- China—**Marco Polo (Italy)**
- Brazil—**Pedro Alvares Cabral (Portuguese)**
- Canada—**John Cabot (Italy)**
- Tasmania Island—**Abel Tasman (Dutch Netherland)**
- Greenland—**Viking Erik the Red**
- Solar System—**Nicolaus Copernicus (Poland)**
- Australia, Antarctica, Hawaii (Sandwich) Island—**James Cook (England)**
- Sailed around the World, Sailed around Pacific Ocean—**Ferdinand Magellan (Portuguese)**
- Cape of Good Hope—**Bartholomew Diaz (Portuguese)**
- America, Cuba, West Indies—**Christopher Columbus (Italy)**
- Sea Route to India—**Vasco Da Gama (Portuguese)**
- Hudson Bay—**Henry Hudson (England)**
- Planetary Laws—**Johannes Kepler (Germany)**

Famous International Monuments—

Statue of Liberty	New York, USA	Kremlin	Moscow, Russia
Imperial Palace	Tokyo, Japan	Twelve Apostles	Victoria, Australia
Opera House	Sydney, Australia	The Wailing Wall	Jerusalem, Israel
Kinder Dijk	Netherlands	Pompeii	Italy
Christ Redeemer	Brazil	Machu Picchu	Peru
Newgrange Tomb	Ireland	Petra Rock Cut	Jordan
Luxor Temple	Egypt	Great Sphinx	Egypt
St Peter's Cathedral	Vatican City	Tugu Negara	Kuala Lumpur, Malesia
Chichen Itza	Mexico	The Blue Mosque	Istanbul, Turkey
Big Ben	London	Hagia Sophia	Turkey
Grand Canyon	Arizona, USA	Mount Fujiyama	Japan
Angkor Wat Temple	Cambodia	Inukshuk	Canada
Golden Gate Bridge	San Francisco	Colosseum	Rome, Italy
Twyfelfontein	Namibia	Leaning Tower of Pisa	Italy
Eiffel Tower	Paris, France	Hinglaj Mata temple, Katas Raj Temple	Pakistan
Spanish Steps	Rome, Italy		

Tourist and Historical Places in India —

- **Thousand Pillars Temple**—Hanamakonda, Telangana
- **Ajanta Caves**—Aurangabad, Maharashtra
- **Bibi ka Maqbara**—Aurangabad, Maharashtra
- **Belur Math**—Kolkata, West Bengal
- **Dilwara Jain Temple**—Mount Abu, Rajasthan
- **Elephanta Caves**—Gharapuri at Mumbai, Maharashtra
- **Red Fort, India Gate (All India War Memorial)**—New Delhi
- **Fateh Sagar**—Udaipur, Rajasthan
- **Virupaksha Temple**—Humpi, Karnataka
- **Humayun Tomb**—New Delhi
- **Golden Temple (Harmandir Sahib)**—Amritsar, Punjab
- **Thillai Natraj Temple**—Cuddalore, Tamil Nadu
- **Konark Temple**—Odisha (Black Pagoda)
- **Padmanabhaswamy Temple**—Thiruvananthapuram, Keralam
- **Qutub Minar**—New Delhi
- **Char Minar**—Hyderabad, Telangana
- **Sanchi Stupa**—Raisen, Madhya Pradesh
- **Chariot temple**—Hampi, Karnataka
- **Mahabodhi temple**—Bodh Gaya, Bihar
- **Lingaraj Temple**—Bhubaneswar, Odisha
- **Jai villas palace (mahal)** located in Gwalior was built by Maharaja of Gwalior Jayajirao Scindia in 1874. It has Italian and Tuscan style of architecture and is not a museum.
- **Adhai Din Ka Jhopra**—Ajmer, Rajasthan
- **Akbar Tomb**—Sikandara, Uttar Pradesh
- **Bada Imambada**—Lucknow, Uttar Pradesh
- **Diwan -I-Khas**—Agra, Uttar Pradesh
- **Ellora Caves**—Aurangabad, Maharashtra
- **Fatehpur Sikri (By Akbar)**—Uttar Pradesh
- **Fort William**—Kolkata, West Bengal
- **Gateway of India**—Mumbai, Maharashtra
- **Vitthala Temple**—Humpi, Karnataka
- **Rani ki Wav**—Gujarat
- **Jantar Mantar**—Jaipur, Rajasthan (Sawai Jai Singh)
- **Jagannath Temple**—Puri, Odisha
- **Khajuraho Sun Temple**—Chattar Pur, MP
- **Brihadeshwar Temple**—Tanjore, Tamil Nadu
- **Hawa Mahal**—Jaipur, Rajasthan
- **Gol Gumbaz**—Bijapur, Karnataka
- **Victoria Memorial**—Kolkata, West Bengal
- **Lotus temple**—New Delhi
- **Somnath temple**—Gir Somnath, Gujarat
- **Meenakshi Temple**—Madurai, Tamil Nadu

- Jahangir Mahal (Orchha, MP) built by in 17th century.
- Lal Bagh Palace (Indore, MP) built by Maharaja Shivaji Rao Holkar in 1886.

Crematoriums or Resting Place/ Memorial Place (Samadhi Sthal) —

- Giani Zail Singh—Ekta Sthal
- B R Ambedkar—Chaitya Bhumi, Dadar (Mumbai)
- Charan Singh—Kisan Ghat
- Jawahar Lal Nehru—Shanti Van
- Rajendra Prasad—Mahaprayan Ghat, Patna
- APJ Abdul Kalam—Pei Karumbu, Rameswaram (TN)
- Mahatma Gandhi—Raj Ghat (Royal Steps)
- Lal Bahadur Shastri—Vijay Ghat
- Rajiv Gandhi—Veer Bhumi
- K R Narayan—Uday Bhumi
- Indira Gandhi—Shakti Sthal
- Mother Teresa—Columbary at La Loma Park, Manila (Philippines)

United Nations— Foundation— 24 October 1945

- India became a member of the United Nations on 26 June 1945
- India was also the founding member of UN with 50 Nations
- Poland signed on 15 October 1945 as 51st Member.
- Former name — League of Nations (1920). Formed by Woodrow Wilson (USA President) to prevent Another World War*
- Father of UN — Franklin D Roosevelt (USA President 1932-1945)
- UN Flag was adopted on 1947. Sky Blue background of the flag with North Pole in center and two white olive branches placed on to its right and left are symbolized Peace.
- Total members — 193
- Latest member — South Sudan (in 2011), 2nd Last Montenegro (2006)
- Parts or Organs— 6
- Headquarters— New York (USA)
- First Secretary General— Trygve Halvdan Lie (Norway)
- Current Secretary General (9th)— Antonio Guterres (Portuguese) from 2017
- General Assembly (HQ- New York) —Parliament of the World
- The United Nations Security Council met for the first time in church House in Westminster, London
- Security Council — Members- 15 (Permanent- 5 Russia, USA, Britain, China, France)
- Non-Permanent member - 10 (2 Years Term)
- Only Permanent members have veto power.
- India has been elected eight times to the UN Security Council
- Economic and Social Council — 54 members.
- International Court of Justice — The Hague, Netherlands
- Total Judges — 15 (9 Year Term)
- The Secretariat— HQ - New York
- Trusteeship council — Now Disbanded or Not working from 1994.

UN agencies—

Agency	Headquarters
Food and Agriculture Organization (FAO)	Rome, Italy
International Telecommunication Union (ITU)	Geneva, Switzerland
International Labour Organization (ILO)	Geneva, Switzerland
World Health Organization (WHO)	Geneva, Switzerland
World Intellectual Property Organization (WIPO)	Geneva, Switzerland
International Monetary Fund (IMF)	Washington DC, USA
World Bank Group (WBG)	Washington DC, USA
UN Educational, Scientific and Cultural Organization (UNESCO)	Paris, France
Indian Council of Medical Research	AIIMS, New Delhi

International Organizations and their Headquarters—

- United Nations Security Council (UNSC) (24 Oct 1945)
 - United Nations Conference on Trade and Development (UNCTAD)
 - World Trade Organisation (WTO, 1 January 1995)
- New York, USA**
Geneva, Switzerland
Geneva, Switzerland

- Organization of Petroleum Exporting Countries (OPEC) (1960)
- Asia-Pacific Economic Cooperation (APEC) (1989)
- International Renewable Energy Agency (IRENA, 2009)
- International Atomic Energy Agency (IAEA) (1957)
- North Atlantic Treaty Organisation (NATO) (1949)
- Association of Southeast Asian Nations (ASEAN) (1967)
- Commonwealth of Nations (1931)
- World Gold Council
- South Asian Association for Regional Cooperation-SAARC (1985)
- Worldwide Fund for Nature (1961)
- United Nations Environment Programme (UNEP) (1972)

Other Organisation—

- I2U2 Summit- India, Israel, US and UAE (Also known as West Asian QUAD) from Oct 2021
- QUAD — India, Japan, Australia, USA (Also known as Quadrilateral Security Dialogue) from 2007
- G-7 — Developed Countries — Germany, France, Japan, USA, Italy, Canada, England
- (Trick for G-7 Countries - **GF JUICE**)
- G-20 — Medium Income Countries or Developing Countries founded in 1999
- India host 2023 G-20 Summit. African Union is added in 2023 G-20 Summit.
- 2024 G-20 will be host by Brazil in 2024. 2025 by South Africa and 2026 by USA.
- Non-Alignment Movement (NAM)— 1961 (Belgrade, Serbia), HQ- Kathmandu (Nepal)
- India was founding member of NAM with 25 Countries
- BRICS (Brazil, Russia, India, China, South Africa) — 2009
- Egypt, Iran, Saudi Arabia, UAE, Ethiopia, and Argentina joined the BRICS in August 2023 at South Africa Summit.
- BRICS new Development Bank — Shanghai (China) from 2015.
- Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)- 1997, Member- 7 countries.

Vienna, Austria
Queenstown, Singapore
Abu Dhabi (UAE)
Vienna, Austria
Brussels, Belgium
Jakarta, Indonesia
London, United Kingdom
London, United Kingdom
Kathmandu, Nepal (8 country members)
Gland, Switzerland
Nairobi, Kenya



PHYSICS

Study of nature and natural phenomena is known as Physics.

Father of Modern Physics – **Sir Issac Newton**

SI SYSTEM – Seven Fundamental Units used from 1960 –

POWER OF TEN-

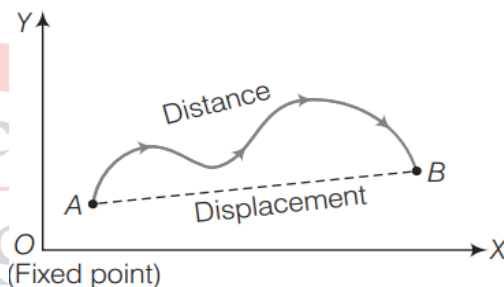
Multiples

Exa (E) = 10^{18}
 Peta (P) = 10^{15}
 Tera (T) = 10^{12}
 Giga (G) = 10^9
 Mega (M) = 10^6
 Kilo (k) = 10^3
 Hecto (h) = 10^2
 Deca (da) = 10^1

Submultiples

atto (a) = 10^{-18}
 femto (f) = 10^{-15}
 pico (P) = 10^{-12}
 nano (n) = 10^{-9}
 micro (μ) = 10^{-6}
 milli (m) = 10^{-3}
 centi (c) = 10^{-2}
 deci (d) = 10^{-1}

Fundamental Quantities	SI units	Abbreviations
Length	Meter	m
Mass	Kilogram	kg
Time	Second	s
Electric current	Ampere	A
Temperature (Thermodynamic)	Kelvin	K
Luminous intensity	Candela	cd
Amount of substance	Mole	mol



Distance and displacement of an object

MOTION

- **Distance** – Total length covered by an object. It will always Positive.
- **Displacement** – Minimum distance between initial and final point. It may be Positive, Negative or Zero.
- Unit of Distance and Displacement have same – **meter**.
- **Speed** – Distance covered by a moving body in unit time. Speed = Distance / time - km/h
- **Velocity** – The rate of change of displacement.
- Unit of Speed and Velocity have same – **m/s**.
- **Acceleration** – The rate of change of velocity. Unit – **m/s²**
- Decrease in acceleration is called retardation or deceleration.
- **Force** – A push or a pull, which can change the position, shape or direction of motion of a body.
- SI Unit – **Newton (N)**
- **Momentum** – Can be defined as "mass in motion". All objects have mass; so, if an object is moving, then it has momentum. Mass $\times$ Velocity = Momentum.
- **Impulse** – When large force acts on a body for a short interval of time. Ex. Karate man break the bricks with Impulsive Force.



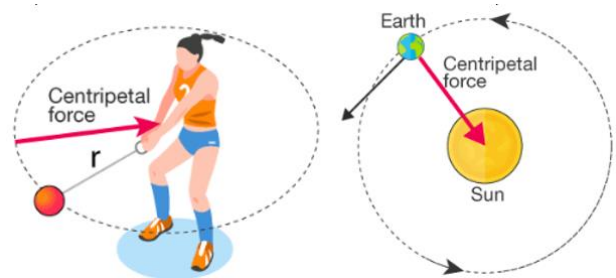
NEWTON'S LAWS OF MOTION

- **First Law** – a body at rest will remain at rest and body at motion will remain in motion, until external force is applied.
- First law gives the definition of Inertia. So, it is also called the **Law of Inertia**.
- Ex. – A person sitting in a moving car falls forward when the car stops suddenly.
- The people sitting in the bus fall backward when bus starts to move suddenly
- A man getting down of a moving bus fall forward due to inertia.
- The dust particles from a woolen blanket fall off when it is beaten by a stick
- A tablecloth can be removed from underneath of dishes.
- **Second Law** – The force applied on a body is equal to the product of mass of the body and the acceleration produced in it.
- It is also defined as the rate of change of linear momentum of a body with time. **F = ma**
- Ex. – Pushing or pulling an empty cart is easy as compared to a loaded cart because the loaded cart has more mass
- Hitting a ball by a bat. Spring and Shock Absorber used in vehicles.
- A fielder takes his hand backward while catching a ball
- Karate Player Breaking Slab of Bricks
- Racing car mass reduce to get more acceleration.
- Person having more mass tends to move slower, and the person having less mass tends to move faster
- **Third Law** – Every action there is always an equal and opposite reaction. Also known as Action and Reaction Law.

- Ex. – Pulling an elastic band, Swimming or rowing a boat, Walking, Slapping to a person.
- In a rocket the gases are ejected from backwards and it is pushed forward
- On firing bullet, the gunner is pushed backward
- Pull water bucket from a well. Punching or Kick someone.
- Boat is pushed back when a boatman is jumped from the boat

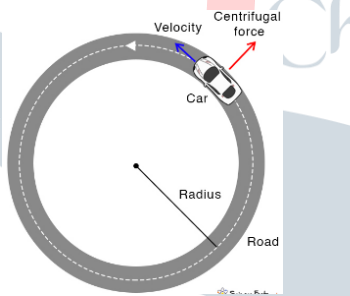
CENTRIPETAL FORCE

- It is the force towards the centre of circle, which is necessary to bound the motion of a particle on the circular path.
- Cyclist bends his body towards the centre on a turn while turning to obtain required centripetal force.
- Banking of road is raising outer edge and bend inner edge.
- All planets revolve around sun and all satellites revolve around planet due to centripetal force.

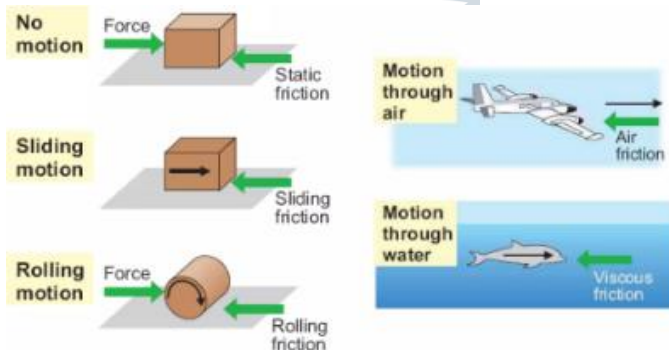
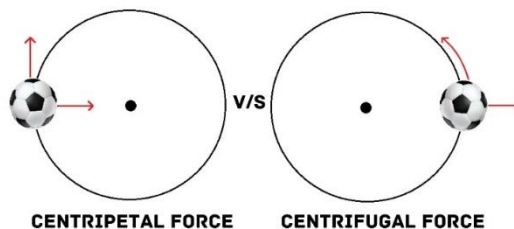


CENTRIFUGAL FORCE

- The force acting away from the center.
- Centrifugal force is **Zero at poles** and **maximum at Equator**.
- Washing machine Drier, Cream separator, drifting of a vehicle, Swinging fair rides etc.



WHAT'S THE DIFFERENCE?



- **FRICION-** The force that opposes the relative motion between two surfaces of objects when they come in contact.

- Friction always works on opposite direction
- Ball Bearing and lubricant oil reduce friction.
- Wheels and polished also reduce friction.
- Walking, Writing, lightening of Matchbox, using of Eraser, Ironing of shirt is possible due to friction.

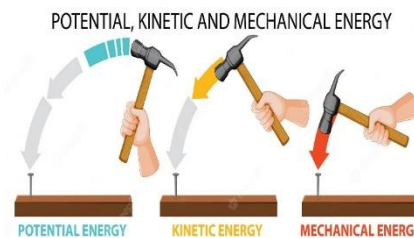
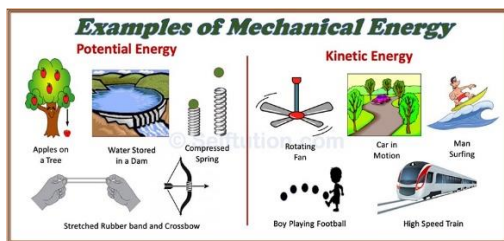
WORK, ENERGY AND POWER –

- **Work** – When a body is displaced by applying a force on it, then work is said to be done. SI Unit of work– Joule
- Work = Force × Displacement (in the direction of force)

- **Power (P)** – It is measured as the time rate of doing work by a body. Work Done / Time Taken.
- SI Unit of Power = Watt (W). Kilowatt is not a unit of energy. It is the unit of power
- 1 kilowatt = 10^3 watt, 1 Mega Watt = 10^6 watt, 1 Horse Power = 746 watt.

ENERGY –

- Capacity or ability of the body to do a work. SI Unit – Joule (J). Commercial unit of Energy is – kWh (1 kWh= 3.6×10^6 Joule).
- **Potential Energy** – The energy that is stored in an object. P.E is measured in – mgh
- m= mass of a body, g= gravitational acceleration and h= height.
- Water stored in a dam, stretching a rubber band, bouncing ball, Spring, stretched bow and spring are example of P.E.
- **Kinetic Energy** – The energy expressed by a body due to its motion (or momentum). Formula of K.E. – $\frac{1}{2} mv^2$
- A running athlete, a falling coconut, blowing wind and wind mills, a flying aircraft etc., possess kinetic energy
- **Note:** Moving aero-plane possesses both P.E and K.E
- **Mechanical Energy** – The sum of kinetic energy and potential energy is called Mechanical Energy.



ENERGY TRANSFORMATION –

- Energy can neither be created nor destroyed but can be converted from one form to other.
- **Dynamo:** Mechanical Energy to Electrical Energy
- **Loud Speaker:** Electrical Energy to Sound Energy
- **Solar Cell:** Solar Energy to Electrical Energy
- **Gas Stove:** Chemical energy to Heat energy
- **Electric Iron:** Electrical energy to Heat energy
- **Electric Motor:** Electrical Energy to Mechanical Energy
- **Microphone:** Sound Energy to Electrical Energy
- **Electric Bulb:** Electrical Energy to Light and Heat Energy
- **Electric Generator:** Mechanical Energy to Electrical Energy
- **Sun:** Nuclear energy to heat and light

GRAVITATION –

- Gravitation or gravity is a natural phenomenon by which all the physical bodies attract each other
- Sir Isaac Newton gave the definition of universal attractive force. It is also known as Gravitational force
- The force of attraction by earth centre on a body is called gravitational pull or gravity. It is denoted by **g (9.8 m/s²)**.
- SI unit of Gravity is m/s². Gravity at the moon is 1/6 of Earth.
- Earth's atmosphere is possible due to gravity.
- The value of g is **Minimum at Equator** and **Maximum at Poles** (it happens due to shape of the earth).
- The centre of gravity is a point where the maximum weight of an object is located and balanced. If centre of gravity is unbalanced objects are toppled and turn over. Mountaineer Bend or Lean forward while climb the mountain.

MASS AND WEIGHT OF A BODY –

- SI unit of mass is kg, while SI unit of weight is Newton
- Mass of body remain constant at all place but Weight of a body changes from place to place due to gravity
- Weight of a body will be maximum at poles and minimum at equator
- When a lift is still or moving uniformly – No change in weight
- If lift goes up with acceleration, the body experiences Weight increases
- If lift goes down with acceleration the body experiences weight decreases
- If lift cable is broken or free fall the body experiences Zero weight

ESCAPE VELOCITY –

- Minimum velocity needed to escape Earth's gravitational field.
- Escape Velocity of Earth is 11.2 km/s. Escape Velocity of the Moon is 2.38 km/s

SATELLITE –

- The heavenly body, which revolves around the planet is called satellite. e.g., Moon is the only natural satellite of the Earth.
- A man-made satellite is called Artificial satellite. 1st artificial satellite was SPUTNIK-I (Russia) on 4 October 1957.
- Polar satellite is located about height of 500 – 800 km. Time taken to revolve around Earth is 88 to 100 minutes. Polar satellite used as Environment monitoring, Military spying, Ozone layer monitoring, Topography of Earth and Moon etc.
- Geostationary Satellite rotate from West to East as like Earth (in 24 Hours), located about 35786 km height from Earth.
- These Satellite are used for TV and Mobile Communications, Weather forecasting, studying meteorites etc.

MATTER –

- Matter is made up of atoms and molecules. It has three states- Solid, Liquid and Gas.
- 4th state of matter is ionized state known as Plasma. 5th state of matter is Bose-Einstein condensate (Only made in lab)

PRESSURE –

- The force acting per unit area of a surface is known as pressure.
- **Pressure = Force / Area.** SI unit of Pressure is N/m² or Pascal (Pa)
- In liquids pressure exerts in all directions.
- Force on larger area reduces pressure. Reduction of surface area increases pressure.
- School bags have broad straps, it easy to pop a balloon with needle tip than nails.
- It is easier to hammer a sharp pin than a blunt pin

ATMOSPHERIC PRESSURE –

- The air (gases) envelope the earth is called atmosphere and the pressure exerted by it on a body on the earth is called atmospheric pressure. Atmospheric pressure is maximum at surface of earth and decreases with heights (altitude).
- Atmospheric pressure is measured by Barometer. 1 bar = 76 cm. Evangelista Torricelli (Italy) made barometer in 1643
- Barometers are also used for weather forecasting. The slow rise and in barometer – indicate clear weather.
- Sudden fall in Barometer – Indicates storm. Slow fall in Barometer – indicates rain

PASCAL'S LAW –

- The increase in pressure at one point of the enclosed liquid is transmitted equally to all other points of the liquid
- Hydraulic lift, hydraulic pump and hydraulic brakes (disc brakes) are based on Pascal's law.

BUOYANT FORCE (BUOYANCY) –

- The upward force exerted by a fluid on the immersed body is called buoyant force or buoyancy or upthrust.
- **Archimedes' Principle** – When a body is fully or partially dipped into a fluid, the force of buoyancy acting on the body will be equal to the weight of displaced fluid by it.

DENSITY –

- The ratio of mass (weight) to the volume of a body is called its density. When density of any object is equal or lower than water, the object floats on water. SI unit of density is kg/m^3 . Density = Mass / Volume.

FAMOUS SUBSTANCE AND THEIR DENSITY (kg/m^3) –

- Platinum (21500), Gold (19300), Mercury (13600), Copper (8900), Water (1000), Ice (917), Wood (500-700)
- **Note:** - Osmium have the maximum density (22590) and Hydrogen have the least density (0.0837)
- An instrument used to measure the density of liquid – Hydrometer

SURFACE TENSION –

- The surface of liquid behaves like an elastic membrane and therefore has a tendency to contract (shrink). This property of a liquid is called surface tension. SI unit is N/m (Newton per meter).
- Surface tension of a liquid decreases with an increase in temperature.
- Soaps and detergents decrease the surface tension of water and thus, they clean the clothes
- Rain drops are spherical due to Surface tension
- Fresh foods and warm soup are tasty due to its lower surface tension, it spreads inside the mouth and gives desired taste
- Dancing of camphor on water is based on Surface Tension
- Insects walking on water, floating a needle on the surface of the water, Clinical test for jaundice, disinfectants and Floor Cleaners are other examples of Surface Tension.

CAPILLARITY –

- A rise or fall of liquid in a glass tube of a very small diameter when dipped is called capillarity
- A blotting paper soaks ink by the capillary action, in pen ink rises due to capillarity.
- Writing nib of pen, the rise of any oil in the wick, cotton clothes absorb water due to capillarity.
- In plants, the water is transferred to the leaves from the roots by capillarity
- The action of a towel in soaking up moisture from the body is due to the capillary action
- To broke capillaries in the soil after rain, the farmer ploughs their field because water remains in the lower layers of the soil

VISCOSITY –

- The property of liquids due to which they oppose the relative motion between their different layers is called viscosity
- The viscosity of a liquid is measured by viscometer or rheometer
- SI unit of coefficient of viscosity is Pa-s or Ns.m^{-2}
- Liquid has higher of viscosity than gases
- Some liquids are more viscous than other such as honey, it is more viscous than water

Note: Matters are broadly divided into three categories i.e., solid, liquid and gas.

- Combinedly, liquid and gas are known as fluid (that can flow)
- It is difficult to change the density of the liquid while its volume can be changed easily

APPLICATION'S OF BERNOULLI'S THEOREM –

- Lift on an aircraft wing is based on Bernoulli's principle
- Venturimeter (the rate of flow of fluid through a pipe) is based on Bernoulli's principle
- Aspirator Pump (used in medical line) also based on Bernoulli's principle

- Swing of a cricket ball is also example of Bernoulli's principle

TYPES OF WAVES: – Waves are Two types- MECHANICAL WAVES and ELECTROMAGNETIC WAVES

MECHANICAL WAVES – The waves which required a medium to propagate.

- Mechanical Waves divided into two types- Transverse Waves and Longitudinal Waves
- Light waves are transverse waves. Apart this S-waves of earthquake, Radio waves, Waves on a guitar string, Waves in water by throw a stone, the wave created by a crowd at a sporting event are also example of Transverse Waves.

Note: Transverse Waves only propagate in solids and liquids.

- Sound waves are longitudinal waves. Apart this P-waves from earthquakes, pressure waves in a gas, Vibrations in a slinky (spring) and Ultrasound waves are other examples of Longitudinal Waves.

• **Note:** Longitudinal Waves can propagate in all mediums such as solids, liquids and gases.

ELECTROMAGNETIC WAVES: – The waves which do not required any medium, even they propagate in vacuum also.

Cathode rays, canal rays, α -rays, β -rays, gamma rays, X-rays, ultrasonic waves, microwaves, infrared light, ultraviolet light are examples of Electromagnetic Waves.

• **Note:** Radio waves has low frequency and longer wavelength while gamma rays have high frequency and low wavelength.

- Gamma Rays first discovered by Paul Villard. Later it was described by Henry Becquerel. These rays are mainly used in the treatment of cancer disease

• X-rays was discovered by Wilhelm Conrad Roentgen in 1895. They are mainly used in detecting the fracture of bones, hidden bullet, needle etc. inside the body.

• Ultraviolet (UV) Rays was discovered by Ritter in 1801. UV Rays are used in preserving food stuffs, detection of invisible writing, forged documents, forged currency and finger prints.

• Visible Light- Sir Issac Newton first demonstrated that white light is composed of seven colors,

• Infrared Waves was discovered by William Herschel in 1800. Infrared radiations are also used for looking through haze, fog and mist during war time. It is also uses in TV remote sensors, photography and CCTV camera.

• Microwaves was discovered by Heinrich Hertz in 1888. Microwaves are used in RADAR, spacecraft communication, TV, and telephone communications

• Radio Waves also discovered by Heinrich Hertz. Radio wave used in Radio and TV communication systems

HEAT – SI Unit of Heat is Joule. 1 calorie = 4.186 joules

• A Thermometer is used to measure the temperature of a body. SI Unit of temperature is Kelvin.

• CELSIUS SCALE ($^{\circ}\text{C}$), FAHRENHEIT SCALE ($^{\circ}\text{F}$), KELVIN SCALE (K), REAUMUR SCALE (R) and RANKINE SCALE (Ra) are some other temperature scales.

• The normal temperature of human body is 98.6°F or 37°C .

• At -40° , Celsius and Fahrenheit thermometers read same. At $+574.25^{\circ}$, the Fahrenheit and Kelvin scales read the same

• At -25.6° , Fahrenheit and Reaumur scales read the same. At 0° , Celsius and Reaumur scales read the same

• The scale that measures our body temperature is called a clinical thermometer.

• Its range is between 35°C to 42°C or 94°F to 108°F .

• Mercury Thermometer read from -39°C to $+367^{\circ}\text{C}$. Below -39°C alcohol scale is used.

• Water has its minimum volume and maximum density at 4°C . So, aquatic life is possible during very cold weather.

• **Specific Heat** – Heat needed to increase the temperature of a substance by 1°C .

• **Latent Heat** – The amount of heat required to change the phase of a substance without changing in temperature

• Example –Water keeps boiling, temperature remains at 100°C (212°F) until the last drop evaporates.

Transmission of Heat –

• **Conduction** – Heat transmits without actual movement of particles. Example- in solids

• **Convection** – Particles moves when heat transmits, happens in liquids and gases. Example- Hot air rising above a fire

• **Radiation** – It doesn't need any medium. Earth warm due to radiation of Sun. Dark colored objects absorb get more heat.

SOUND –

• Sound is a form of energy, which produces the sensation of hearing. These are longitudinal mechanical waves.

• Any sound louder than 90 decibels can cause permanent loss of hearing.

• Intensity of Sound is measured in Decibel (Db) while frequency of sound is measured in Hertz (Hz).

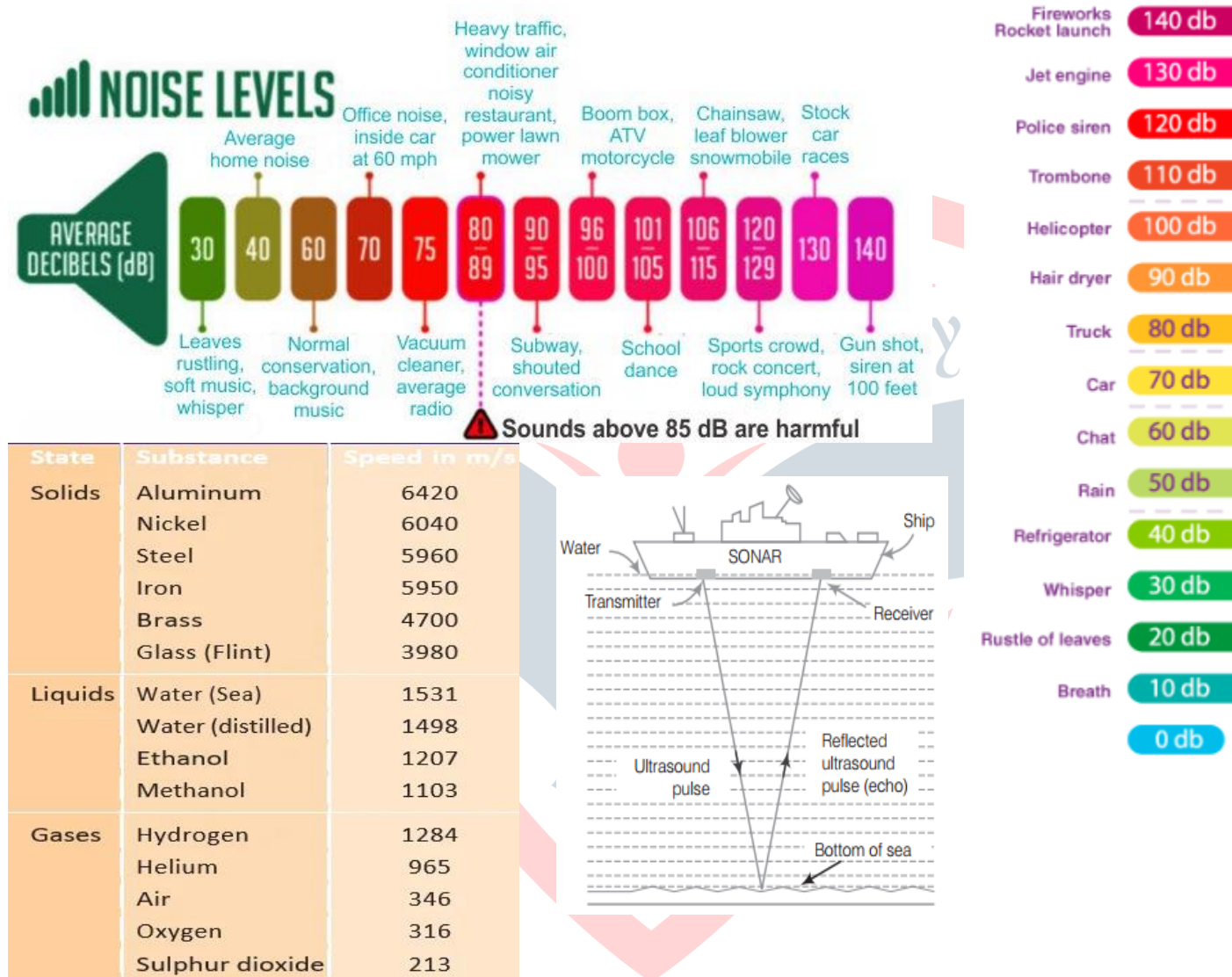
• Sound waves have low frequency and high wavelength. These waves cannot travel in vacuum. Sound Waves has 3 Types –

Infrasonic Waves – Frequency is less than 20 Hz. These waves are produced by earthquakes, volcanic eruptions, ocean waves, elephants and whales. Rhinoceroses communicate using infrasound of frequency as low as 5 Hz.

Audible, Sonic or Sound Waves – Frequency range is 20 to 20000 Hz. Human can hear it.

Ultrasonic Waves – Frequency range is above 20000 Hz. Human ear cannot detect these waves. But certain creatures like dog, cat, bat, mosquito etc., can detect these waves. Bat not only detect but also produce ultrasonic waves.

• Uses of Ultrasonic waves- For sending signals, for measuring the depth of sea, In Sonography, In SONAR, for cleaning clothes, aero planes and machinery parts of clocks, for removing lamp-shoot from the chimney of factories etc.



Speed of sound in different medium – In any medium as we increase temperature, the speed of sound also increases.

• Speed of sound in air is 331 m/s at 0 °C and 344 m/s at 22 °C

• Water vapor in air increases the speed of sound because water vapor is less dense than air.

Echo – Repetition of sound due to the reflection of sound waves. Time interval between original sound and reflected one must be at least 0.1s. Reflecting object must be more than 17.2m from the sound source for Echo.

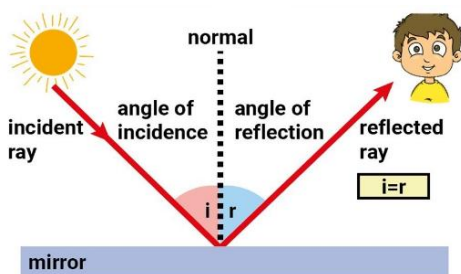
Doppler Effect – It is used by police to check over speeding of vehicles, at airports to guide the aircraft, to study heart beats and blood flow in different parts of body.

LIGHT – The light is that form of energy, which makes objects visible to our eyes. speed of light in vacuum is 3×10^8 m/s.

• Transparent Objects: Allows light to pass through it. Example- Glass, Water

• Translucent Objects: Allows only a part of the light to pass through it. Example- Oiled Paper, Wax Paper, Vegetable Oil.

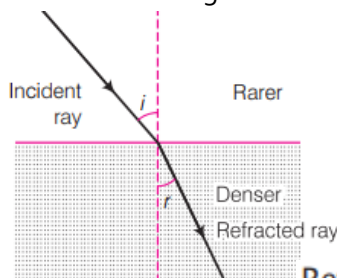
• Opaque Objects: Does not allow light to pass through it. Example- Rock, Metal, Wood



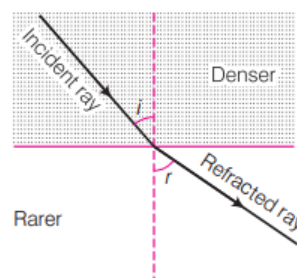
Reflection of light

Reflection of Light – The phenomenon of bouncing back of light into the same medium, when it strikes on a smooth shining surface. The angle of incidence is always equal to the angle of reflection.

Refraction Of Light – Speed of Light is different in different medium. When a ray of light passes from one medium to another, it bends. This phenomenon is called Refraction of Light.



Refraction of light



- Twinkling of stars, Rainbow forming, Pencil look bend in water, hand look big in water, ponds & rivers look shallow, sun appears two minutes before the actual sunrise and sets two minutes after the actual sunset due to refraction of light.

Total Internal Reflection – When ray of light reflect back into the same medium, total internal reflection takes place

- Mirage in deserts, optical Fibre, sparkling of diamond, endoscopy, shining of cracked glass are example of TIR.

Convex Mirror – Also called diverging mirror. Always forms a virtual, erect, and diminished (Small Size) image

- Side and rearview mirror of vehicles, Security mirrors in stores, mirror put on curves and turns of road are some basic examples of convex mirror.

Concave Mirror – Also called converging mirror. Always forms a real and inverted image.

- Headlights of vehicles, Mirror used by Dentist, Solar cookers, Torchlights and flashlights, Shaving and makeup mirrors, Searchlights, Visual bomb detectors and Ophthalmoscope for examining the eye are some basic examples of concave mirror.

Note: When an object put between two plane mirrors infinite (∞) number of images are formed.

Scattering of Light – Sunlight scatters due to small particles in the atmosphere.

- Red Colour is scattered least and Violet Colour of light is scattered most. Example of Scattering of Light: Danger signals are Red Colour, Sky appears blue, Sun appears reddish during sunrise or sunset, Clouds appear white and Ocean looks Blue.

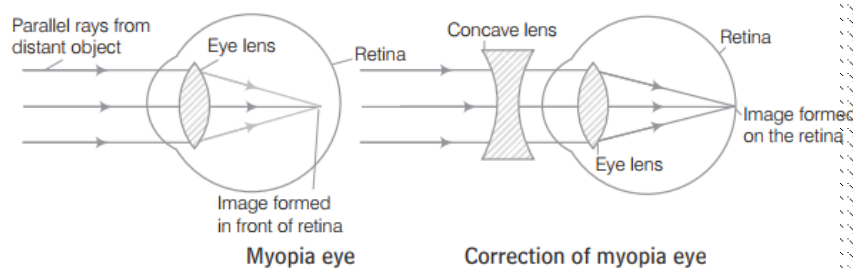
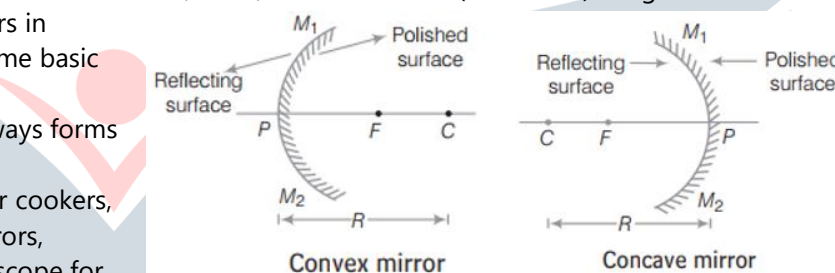
Dispersion of Light – When ray of light is incident on a glass prism, it splits into seven colours in the sequence of VIBGYOR. This phenomenon is called dispersion of light. VIBGYOR- Violet-Indigo-Blue-Green-Yellow-Orange-Red.

Human Eye – Normal range of vision of human eye is minimum: **25 cm (9.842 inch or 250 mm)**

- Light enters the eye through a thin membrane called the cornea.
- The human eye forms the image of an object at its **Retina**.
- The human eye's lens forms a **real and inverted image**.
- When we transplanted or donated eyes, Cornea is most often donated.

Defects of Vision –

- **Myopia or Short Sightedness** – Affected person can see nearby objects clearly but cannot see far away objects.
- Concave lens (–) is used to cure from Myopia or Short Sightedness.



- **Hypermetropia or Long Sightedness** – Affected person can see far away objects clearly but cannot see nearby objects.
- Convex lens (+) is used to cure from Hypermetropia or Long Sightedness.
- Power of lens is measured in **Diopter**.

• **Astigmatism** – Irregular movement of eyeballs and affected person cannot focus on horizontal and vertical lines. Cylindrical lenses are used to cure.

• **Presbyopia** – occurs gradually with increasing age or old age persons. Both eyesight's are weak in this defect.

• Bifocal lenses are used to cure from Presbyopia. It was invented by Benjamin Franklin.

• **Colour Blindness** – In this defect a person is unable to find difference between green and red colour and sometimes blues as well. This is due to absence of cone cells. Colour Blindness is genetic and cannot be cured.

• **Cataract (Motiyabind)** – A white membrane is developed on cornea. Need surgery to cure from Cataract.

ELECTRICITY & MAGNETISM –

- When matter produced electrical and magnetic effects, is called Electric Charge. SI unit of Electric Charge is coulomb (C)
- Electric Charge has two types: Proton (gives positive + charge), Electron (gives negative – charge). Neutron has No Charge.
- Benjamin Franklin (USA) discovered (+) positive and (–) negative charge. Father of electricity: Michael Faraday (England).
- **Electric Current** – the rate of flow of charge is known as electric current. SI unit: Ampere (A).
- Electric Current has two types- Direct Current (DC) and Alternating Current (AC).
- Direct Current is used in batteries & cells and it has zero frequency.
- Alternating Current (AC) is used as household electricity which contains 220 Volts and 50 Hz frequency.
- Frequency is denoting the number of waves in electricity in 1 second.
- **Conductors** – materials that allow heat and electricity easily. Gold, Silver, Copper, Aluminum, Platinum, Human Body, Normal Water, Graphite and approx. all metals are good conductors. Silver is best conductor of electricity.
- **Insulator** – materials that does not allow electricity. Wood, Rubber, Glass, Mica, Distilled Water, Plastic, Papers etc.
- **Semiconductor** – Semiconductors are exhibit between conductors and insulators. Silicon and Germanium are pure Semiconductor while Gallium, Selenium and Cadmium are compounds. Semiconductors uses in computers, smartphones, IC Chips and electronic circuits etc. India's first semiconductor manufacturing plant will be set up in Dholera, Gujarat by 2026.
- **Resistance (R)** – The ability of material to oppose the electric current. SI unit ohm (Ω). Georg Simon Ohm discovered it.
- **Ammeter** – Used to measure electric current or load of electrical equipment.
- **Voltmeter** – Used to measure potential difference or volt between two points in an electric circuit
- **Galvanometer** – Used to measure very low electric current. Like mobile, computer circuits.
- **Electric Power** – The rate of transfer of electrical energy in a circuit. SI unit watt and Horse Power (HP). **1 HP= 746 Watt**
- **Capacitor** – Device use to stored large amount of charge. It commonly used in electric motor, fans, electric circuits etc.
- **Earthing** – The process of discharge of electrical energy to the earth directly and quickly through a wire. Green wire commonly used in earthing.
- Topmost point of plug & sockets is left for earthing. Earthing is used to protect us from electric shock and sky lightning.
- **Electric Fuse** – Safety device used for protecting electric circuits from over volt and short circuits. It is made up of tin-lead alloy (63% tin + 37% lead). Fuse has high resistance and low melting point and always connect in the live wire. Tin-lead alloy also used in as soldering material.
- **Miniature Circuit Breakers (MCB)** – In modern time fuses are replaced by MCBs. MCB can be used unlimited times instead of fuses.
- **Rectifier** – Convert Alternating Current (AC) into Direct Current (DC)
- **Inverter** – Convert DC into AC
- **Transformer** – Convert AC into AC without changing frequency. Change low voltage to high and high voltage to Low.

• **Chemical Effect of Electric Current –**

- Electric Cell in Direct Current (DC) – Device which converts chemical energy into electrical energy.
- Electric Cell has two types – Primary Cell and Secondary Cell.
- Primary cell cannot be recharged. Ex: Remote cell, wall clock cell, Hand watch cell, Torch cell, Portable Radio cell etc.
- Zinc works as anode (+ve terminal) and carbon rods (graphite) act as cathode (–ve terminal) in primary cells

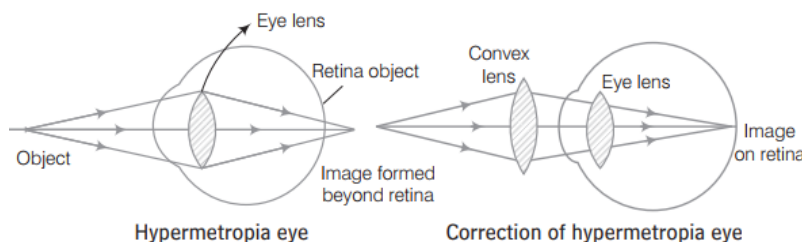
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- Secondary Cell can be charged again and again. Ex: Invertor battery, Car & Bike battery, electric bike & scooter etc.
- Secondary Cell is also known as Lead Acid battery. Anode (+ve terminal) is made up of Lead and Cathode (-ve terminal) is made up of lead dioxide (PbO₂). A 38% solution of Sulphuric acid (H₂SO₄) is used as electrolyte
- Electric Bulb was invented by Thomas Alva Edison in 1879. Bulb filament is made up of Tungsten due to high melting point (3422 °C). Argon gas commonly filled in bulb. Apart this helium, neon, nitrogen and krypton also used for lighting.
- Fluorescent Tubes contains Mercury vapors and Neon & Helium gas.
- Compact Fluorescent Lamp (CFL) is cheaper than Fluorescent Tubes, contains Argon and very small mercury vapors.
- Light-emitting diode (LED) are semiconductors emit light when electric current passes through them
- Immersion Rod, Toasters, Electric Iron, Blower, Electric Kettle, Room Heater, Cooking Heater filament is made up of Nichrome Wire due to its very high resistance.
- Halogen light/ lamp contains tungsten and mixture of inert gases like iodine, bromine and sodium.

MAGNETS – The natural magnet is an ore of iron. It is an oxide of iron. Its chemical formula is Fe₃O₄

- Magnets are made up of Nickel, Iron, Cobalt and Steel.
- A magnet has two poles- North (N) and South (S). Similar poles repel and opposite poles attract each other's.
- SI unit of Magnetic Flux is weber.
- A freely suspended magnet always aligns itself into North-South direction.
- Our Earth behaves like a strong magnet.

IMPORTANT FACTS ABOUT PHYSICS –

- Atom is the smallest unit of matters/ particles. It contains Electron, Proton and Neutron
- X-ray is used to detect Bone Fracture, tooth decay etc. X-ray was discovered by Wilhelm Conrad Rontgen.
- Computed Tomography (CT) Scan used in medical to studies the internal body structures such as tumors in 3D image
- Magnetic Resonance Imaging (MRI) also used in medical to find the detail image of internal body parts.
- When Nuclear word is used, we talking about Radioactive Materials.
- Nuclear Fission- when a nucleus of atom splitting into two nuclei. Nuclear Bomb and Reactor are based on Nuclear Fission.
- Nuclear Fusion- when two lighter nuclei form one heavy nucleus. Sun, Stars and Hydrogen Bomb based on Nuclear Fusion.
- Radioactivity was discovered by Henry Becquerel (France) in 1896. SI unit of radioactivity is the Becquerel (Bq)
- Polonium and Radium were discovered by Marie Curie.
- Uranium Dating is used to determine the age of Rocks and Non-living things.
- First solar cell was built by Charles Fritts (USA) in 1883 from selenium. 1st silicon cell was made in 1954 in USA by a group of scientists in Bell Labs. Solar cell or photovoltaic cell made up of Silicon. It converts sunlight into electricity. Apart Silicon, germanium also used in solar cell.
- Light Amplification by Stimulated Emission of Radiation (LASER) is used in Bar Code readers, CDs & DVDs, Internet and TV Signals, Laser Printers, Cutting Gems and Diamonds, welding, guiding missiles etc.
- Satellite communication started in 1958 and first geostationary satellite in world was Syncom 3 of NASA (USA) in 1964.
- Optical Fibre was discovered by Narinder Singh Kapany (India born British) in 1960s. it is used in Telecommunication.
- Frequency Modulation (FM) used in musical programs on Radio while Amplitude Modulation (AM) used to send signals.
- Wi-Fi (Wireless fidelity) and Li-Fi (Light fidelity) both used in transmit data for Internet. Wi-Fi uses radio waves while Li-Fi runs on visible lights.
- Radio Detection and Ranging (RADAR) is used to locate, guide, identify objects such as aero planes, missiles, ships etc.
- Father of Nanotechnology is Richard Feynman (USA) and Father of Nanotechnology in India is C.N.R. Rao.

FAMOUS SIGNIFICANT AND NOTABLE INVENTIONS –

- | | |
|--|---|
| • Air Conditioning – Carrier | • Aero Plane – Orville and Wilbur Wright (Wright Brothers) |
| • Atom Bomb – Julius Robert Oppenheimer | • Electric Lamp (Bulb) – Thomas Alva Edison |
| • Bicycle – Macmillan | • Petrol Car – Karl Benz |
| • Cement – Joseph Aspdin | • Diesel Engine & Diesel Car – Rudolf Diesel |
| • Petrol Engine – Nicolaus Otto | • Printing Press – J. Gutenberg |
| • Electric Lamp – Thomas Alva Edison | • Hydrogen Bomb – Edward Teller |
| • Machine Gun – Richard Gatling | • Electric Motor – Nikola Tesla |
| • Transformer – Michael Faraday | • Microphone – Alexander Graham Bell |
| • Revolver / Pistol – Samuel Colt | • Radio – G. Marconi |
| • Fibre Optics – Narinder Kapany | • Fountain Pen – Louis Waterman |

- **Safety Razor** – Gillette
- **Steam Engine** – James Watt
- **Television** – John Loggie Baird
- **Hydrogen** – Henry Cavendish
- **Vaccination** – Edward Jenner
- **Heart Transplant** – Christian Bernard
- **Homeopathy** – Samuel Hahnemann
- **Telephone** – Alexander Graham Bell
- **Typewriter** – Christopher Latham Sholes
- **Refrigerator (1755)** – William Cullen Durant
- **Motorcycle** – Gottlieb Daimler
- **Mercury Thermometer** – Daniel Gabriel Fahrenheit

- **Rubber** – Charles Goodyear
- **Rail Engine** – Stephenson
- **Oxygen** – Joseph Priestley
- **Nitrogen** – Daniel Rutherford
- **Stethoscope** – René Laennec
- **Insulin** – Banting and Best
- **Ball Point Pen** – C. Biro
- **Telegraph Code** – Samuel Morse
- **Tractor** – John Froelich
- **First Home Electric Refrigerator (1913)** – Fred W. Wolf
- **Thermometer** – Galileo Galilei

CHEMISTRY

- Father of Chemistry – **Antoine Lavoisier (France)**

- Smallest unit of Element is – **Atom**

• **MATTER** – Anything which has mass, occupies space and can be felt by our one or more sense organs is called matter.

- Five state of matter- Solid, Liquid, Gas, Plasma and Bose- Einstein Condensate (BEC).

- When gases are heated to very high temperatures then Plasma formed. CFL tube glow due to Plasma.

- Pure substances can't be separated into other kinds of matter. There are two kinds of pure substance – Elements and Compounds

- **ELEMENT** – Simplest form of matter, that cannot split or broken down into other substances. Ex- Gold, Platinum, Oxygen, Carbon etc.

- Element has three Types – **Metals, Non-Metals and Metalloids**

- **Metals** – Metals are known for their Hardness, Ductility, luster. They are good conductor of heat and electricity.

- Mercury is only metal liquid at room temperature. Wrought Iron is purest form of Iron.

- Mercury, Cesium, Rubidium and Gallium are metals but their melting point is very low or below 40°C.

- Metals are generally hard but Sodium, Lithium and Potassium are cut with knife.

- Total metals are 93 founded yet. Example- Gold, Silver, Iron, Nickel, Platinum etc.

- **Non-Metals** – Non-Metals have opposite properties of metals. They are non-lustrous and poor conductors of heat and electricity. They have low melting and boiling points. Exception are Graphite (allotropic of Carbon) is good conductor of electricity and Iodine is lustrous. Example- Hydrogen, Chlorine, Carbon etc.

- **Metalloids** – They have common properties of both metals and non-metals. Example- Antimony, Silicon, Polonium etc.

- **COMPOUNDS** – Pure substance which composed of two or more elements (components). It has two types –

- **Organic Compounds** – They contains carbons and made up of living things. Examples- carbohydrates, fats, proteins, acids

- **Inorganic Compounds** – They obtained from non-living sources. Examples- phosphoric acid, Ammonia, Sulphuric acid etc.

- **MIXTURES** – These are obtained by mixing two or more substances in any proportions. There are two types of mixtures –

- **Homogeneous Mixtures** – Also known as True Solution and mixed completely. e.g., salt solution, sugar solution

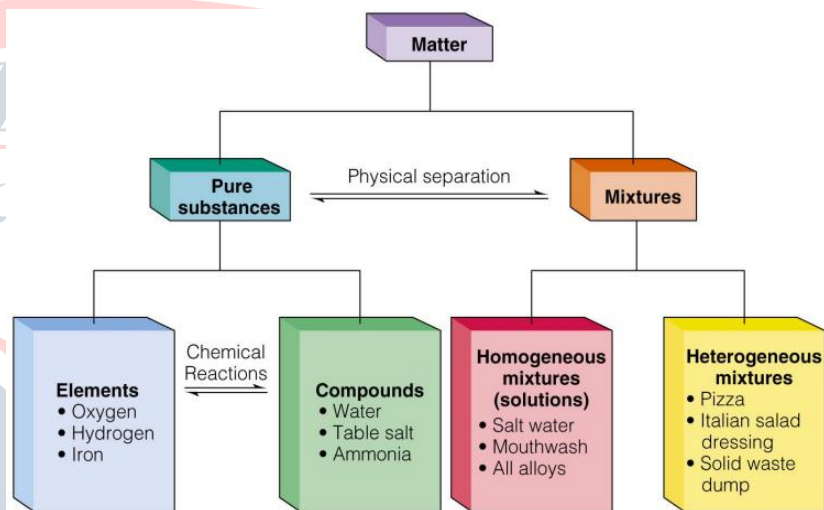
- **Heterogeneous Mixtures** – When mixture doesn't mix completely. e.g., water and sand, soil mixture, water and oil mixture

SEPARATION OF MIXTURES –

- **Sublimation** – Convert Solid to Gas without gain liquid form. Examples- Dry Ice from CO₂, Naphthalene, Iodine, Arsenic etc.

- **Hoar Frost** – It is reverse of sublimation. Formation of snow by freezing of clouds or vapors is called Hoar Frost.

- **Evaporation** – When a liquid turns into gas, is called Evaporation. Ex- Drying of wet hair, wet clothes drying in the sunrays, common salt prepared from sea water, water pot (ghada) is porous and thus become cool in summer due to evaporation.



- **Sedimentation and Decantation** – Insoluble heavy particles in liquid are allowed to settle down, is called Sedimentation. After some time, clear liquid moves to another vessel without disturbed the sediments, this is called decantation.
- **Filtration** – The process in which solid particles removed from a liquid through a filter paper or a sieve. Ex. Separate tea leaves from tea. Water purifier, sewage water treatment plant is based on filtration process.
- **Condensation** – The process by which water vapors or gas turns into liquid. Ex. Vapors in air condense on cold surface.
- **Distillation** – This process done in liquid only. In this process conversion of a liquid into vapor and then it condensed back to liquid form. Ex. Pure water or distilled water, liquor from sugarcane juice or grapes is made by distillation process.
- **Fractional Distillation** – Used where very less difference in their boiling point. Diesel, petrol, kerosene oil is separated from crude oil by this method.

ATOMS – Smallest fundamental building block of matter or smallest unit of element. Atoms divided into three particles-

- **Proton** – Contains Positive (+ve) charge. Discovered by Eugen Goldstein. Name given by Ernest Rutherford. it is obtained by anode ray's treatment. Located inside the nucleus.
- **Electron** – Contains Negative (-ve) charge. Discovered by J.J. Thomson in 1897. Name coined by G. Johnstone Stoney. it is obtained by cathode ray's treatment. Located around the nucleus.
- **Neutron** – Contains No or Zero Charge. Discovered by Sir James Chadwick. Located inside the nucleus.
- If electrons are less than protons, then it contains +ve charge. It is also called Cat-ion. If electrons are more than protons, then it contains -ve charge. It is also called An-ion.

• The term molecule was given by Avogadro (Italy). Avogadro number is 6.022×10^{23} .

• **ATOMIC NUMBER (Z)** – The number of proton or electron are present in atom of element. Ex. ${}_6\text{C}$. 6 is atomic number.

• **MASS NUMBER (A)** – The sum of number of protons and neutrons present in an atom. Ex. C^{12} . 12 is mass number.

• **ATOMIC MASS** – The total mass of protons, neutrons and electrons in an atom.

• **ISOTOPES** – When an element having same atomic number, but different mass number, is called Isotopes. (Iso = Same, topos = Place). Ex. – ${}_1\text{H}^1$ (protium), ${}_1\text{H}^2$ (deuterium) and ${}_1\text{H}^3$ (tritium) are isotopes of hydrogen. Out of these, Tritium is radioactive. In Isotopes number of protons and electrons are same but number of neutrons are different.

• **RADIOISOTOPES** – Isotopes of higher than 83 are radioactive. Radioactive isotopes are called Radioisotopes. Some examples- **Iodine-131** – Used for treatment of thyroid gland. **Iodine-123** is used in brain imaging. **Cobalt-60 and Phosphorus-32** is used for treatment of cancer. **Uranium-92** is used for estimating the age of rock.

• **ISOBARS** – When elements having the same mass number but different atomic number. Ex ${}_{19}\text{K}^{40}$, ${}_{20}\text{Ca}^{40}$ etc.

• **PHYSICAL CHANGE** – Temporary change. No new substance is formed. It just changes the physical properties of matter like colour, density, hardness, melting point but does not change the chemical properties. Ex. Boiling of water, cutting of trees, melting of ice, crumpling of paper, freezing the water, mixing sand with water, breaking the glass or bottle etc.

• **CHEMICAL CHANGE** – Permanent change. New substance is formed. In this change physical and chemical composition both changed. Ex. Souring of milk, burning of candle and gases, ripening of fruits, burning of paper, Photosynthesis, Digestion of food, rusting of iron, cooking of food, heating the sugar, baking of cake cooking an egg etc.

ACIDS, BASES AND SALTS –

• **Acids** – Substances, which have sour in taste and turn blue litmus into red. Acids can donate Protons and accept Electrons.

• Hydrochloric acid (HCl) used in digestion. Apart this it is used as a bathroom cleaner, pickling agent, tanning of leather, in dying etc.

• Nitric acid (HNO_3) is used for manufacturing of fertilizers, purifying the Gold, making explosives (TNT, picric acid, dynamite etc.) and making drugs

• Sulphuric acid (H_2SO_4) is used in lead acid batteries and making detergents.

• Boric acid used as an antiseptic, used for eye-wash, used as powder for rice.

• Oxalic acid used to remove rust spot from the clothes.

• Citric and Acetic acids are used as flavoring agent and food preservatives

• In the bite of red ant Formic acid is found.

• Antacids is commonly used for relieve indigestion and heartburn.

• Acids always kept in glass vessel because they react with metals.

Sources of Some Important Acids

Acid	Source	Acid	Source
Citric acid	Lemon, orange, grapes	Lactic acid	Milk
Maleic acid	Unripe apple	Hydrochloric acid	Stomach
Tartaric acid	Tamarind, apple,	Oxalic acid	Tomato
Acetic acid	Vinegar	Formic acid	Insect sting

- **Bases** – Substances which have bitter taste and turn red litmus into blue. Bases can donate Electrons and accept Protons.
 - Aluminium hydroxide is used for manufacture of aluminium compounds.
 - Calcium hydroxide used to make cement, lime water, neutralize the acidity of soil and in sewage treatment.
 - Sodium hydroxide used for manufacturing of soaps, detergents and cleaners
 - Ammonia is used for manufacturing nitric acid.
 - **Salts** – When acid and base react together, they form salt and water. It is also known as neutralization reaction.
 - **Uses of Some Important Salts** – Common Salt or table salt or our house salt is known as sodium chloride (NaCl)
 - Sodium carbonate or Washing Soda (Na_2CO_3) is used for manufacture of detergents, soaps, making glass etc.
 - Sodium bicarbonate or Baking Soda (NaHCO_3) is used for bread, cakes
 - Bleaching powder is known for colorless something or convert something to white. It is used for making bleaching cotton and linen, for removing colors, for bleaching wood pulp in paper factories, for disinfecting drinking water etc.
 - Plaster of Paris (POP) or $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ is used for plaster fractured bones, materials for decoration of houses and roofs, for making toys, for making molds etc. When gypsum is heated to 100° to 120°C , POP obtain.
 - Potassium nitrate (KNO_3) is used for making gun powder, rocket propellants, fireworks, matchsticks etc.
 - Alum (Potassium Aluminium Sulphate) is used for purification of water and used as antiseptic in saloon.
 - Calcium carbonate is also known as Chalk Powder.
 - PH Scale was discovered by Dr. Soren Sorensen (Denmark). PH Scale is express the acidity or basicity of a substance.
 - PH Scale range value is 0 to 14, where 0-7 is acid, 7-14 is bases and 7 is neutral.
 - **Melting Point** – The temperature at which solid becomes liquid is called melting point. When impurities add in substance the melting point will be increased. Ex. Ice melting point is 0°C but when we add impurities its melting point will be -15°C .
 - **Boiling Point** – The temperature at which liquid changes to vapors. It decreases when atmospheric pressure is decrease. Impurities increase boiling point. At mountains atmospheric pressure is decreases, so water Boiling at 70°C .
 - **Freezing point** – The temperature at which a liquid turn into a solid when cooled. Freezing Point of water is 0°C .
- PERIODIC TABLE** – Father of Periodic Table was Dmitri Mendeleev (Russia). Henry Moseley (England) revised it.

pH of Some Common Substances

Substances	pH	Substances	pH
Gastric juice	1.5-3.5	Rain water	5.2-6.0
Soft drinks	2.0-4.0	Tears	6.5-7.6
Lemon	2.2-2.4	Sea water	8.5
Vinegar	2.4-3.4	Milk of magnesia	10.5
Urine (human)	4.8-8.4	Milk (cow)	6.3-6.6
Saliva (human)	6.5-7.5	Blood plasma (human)	7.35-7.45

GROUP 1 1 H Hydrogen 1.008 2 Li Lithium 6.94 3 Be Beryllium 9.012 4 Na Sodium 22.99 5 Mg Magnesium 24.31 6 K Potassium 39.10 7 Ca Calcium 40.08 8 Sc Scandium 44.96 9 Ti Titanium 47.88 10 V Vanadium 50.94 11 Cr Chromium 52.00 12 Mn Manganese 54.94 13 Fe Iron 55.85 14 Co Cobalt 58.93 15 Ni Nickel 58.69 16 Cu Copper 63.55 17 Zn Zinc 65.39 18 Ga Gallium 69.72 19 Ge Germanium 72.64 20 As Arsenic 74.92 21 Se Selenium 78.96 22 Br Bromine 79.90 23 Kr Krypton 83.79 24 Rb Rubidium 85.47 25 Sr Strontium 87.62 26 Y Yttrium 88.91 27 Zr Zirconium 91.22 28 Nb Niobium 92.91 29 Mo Molybdenum 95.96 30 Tc Technetium (98) 31 Ru Ruthenium 101.1 32 Rh Rhodium 102.9 33 Pd Palladium 106.4 34 Ag Silver 107.9 35 Cd Cadmium 112.4 36 In Indium 114.8 37 Sn Tin 118.7 38 Sb Antimony 121.8 39 Te Tellurium 127.6 40 I Iodine 126.9 41 Xe Xenon 131.3 42 Cs Cesium 132.9 43 Ba Barium 137.3 44 La Lanthanides 57-71 45 Hf Hafnium 178.5 46 Ta Tantalum 180.9 47 W Tungsten 183.8 48 Re Rhenium 186.2 49 Os Osmium 190.2 50 Ir Iridium 192.2 51 Pt Platinum 195.1 52 Au Gold 197.0 53 Hg Mercury 200.5 54 Tl Thallium 204.38 55 Pb Lead 207.2 56 Bi Bismuth 209.0 57 Po Polonium (209) 58 At Astatine (210) 59 Rn Radon (222) 60 Fr Francium (223) 61 Ra Radium (226) 62 Ac Actinides 89-103 63 Rf Rutherfordium (261) 64 Db Dubnium (268) 65 Sg Seaborgium (271) 66 Bh Berkelium (278) 67 Hs Hassium (277) 68 Mt Mitlerium (276) 69 Ds Darmstadtium (281) 70 Rg Roentgenium (280) 71 Cn Copernicium (285) 72 Nh Nihonium (284) 73 Fl Flerovium (289) 74 Mc Moscovium (288) 75 Lv Livermorium (293) 76 Ts Tennessine (294) 77 Og Oganesson (294)																		78 Pt Platinum 195.1 79 Au Gold 197.0 80 Hg Mercury 200.5 81 Tl Thallium 204.38 82 Pb Lead 207.2 83 Bi Bismuth 209.0 84 Po Polonium (209) 85 At Astatine (210) 86 Rn Radon (222) 87 Fr Francium (223) 88 Ra Radium (226) 89 Ac Actinides 89-103 90 Rf Rutherfordium (261) 91 Db Dubnium (268) 92 Sg Seaborgium (271) 93 Bh Berkelium (278) 94 Hs Hassium (277) 95 Mt Mitlerium (276) 96 Ds 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• Important Ore's (Raw Metals) of some metals –

- **Aluminium** – Bauxite
- **Lead** – Galena
- **Uranium** – Pitchblende
- **Mercury** – Cinnabar
- **Thorium** – Monazite Sand
- **Silver** – Silver Glance or Argentite
- **Antimony** – Stibnite
- **Iron** – Magnetite and Hematite
- **Copper** – Chalcopyrite or Cuprite
- **Gold** – Calaverite and Sylvanite

SOME IMPORTANT REMEMBERABLE POINTS –

- Elements having a tendency to lose electron and form cation, are called metals.
- Metals are generally good conductors of heat and electricity.
- Metals are Lustrous, Ductile, Sonorous, Malleable and Reactive
- Potassium carbonate is known as **Pearl Ash**
- Aluminum is used for making utensils, electric wires, welding rods.
- Ruby gems has Red, Sapphire has Blue and Emerald has Green Colour.
- Stannous sulphide is also called Mosaic Gold. It is used to making paints.
- Potassium permanganate is used as disinfectant in water. Its colour is deep violet or purple.
- Platinum is known as White gold or Adam's catalyst. Copper, Silver and Gold are also called coinage metals.
- Purity of gold is expressed in carat. Pure gold is 24 carats. Copper or Silver mixed with gold to make its harder.
- Silver Nitrate (AgNO_3) is used as marker during elections (Electoral ink, indelible ink)
- Cloud Seeding Technique – In this produce rain or snow by artificial method. When water vapor in the atmosphere cools and condenses around a particle of dust or salt. Silver iodide is used in artificial rain. Clouds are mostly made of Water Droplets or Ice Crystals.
- Zinc oxide is commonly known as philosopher's wool. It is used for making cosmetic powders, creams etc.
- The name Karsanbhai Patel is associated with Nirma Group.
- Titanium is very hard, so it is used to making jet engines, aircraft frames, turbine engines and marine equipment's.
- Lead is highly toxic metal and very strong poison. It is very harmful for heart, bones, kidneys and nervous system
- Uranium is also called metal of hope. It is used in Defence system and as a fuel of nuclear reactor.
- Bromine is the only liquid non-metal at room temperature.
- Purest form of Carbon is Diamond. It is the hardest natural substance on Earth and bad conductor of electricity. Diamond is used for making jewellery, cutting glass, making bores for rock drilling etc.
- Graphite is a good conductor of heat and electricity. It is used in making electrodes, as a lubricant for heavy machines and used in nuclear reactor as a moderator. The lead of pencil is made from graphite.
- Graphene is used as a conducting material for touch screen, LCD and LED. It is 100 times strongest than stainless steel.
- Heavy Water or Deuterium oxide (D_2O) was discovered by Harold Urey. it is used as a moderator in nuclear reactor
- Hydrogen Peroxide (H_2O_2) is used for germicide and antiseptic for wounds. It is also used for preservatives for milk.
- Carbon Monoxide (CO) formed by incomplete combustion of carbon containing substance. It is highly poisonous in nature
- Carbon Dioxide (CO_2) is also known as Dry Ice. So, it is used in fire extinguisher. Dry ice is also used as a coolant for preserving perishable articles in food industry. CO_2 is also used in soda water like Pepsi, coke etc.
- Nitrogen (N_2) is filled in sealed packets, e.g., potato chips packet and bulbs to create inert atmosphere.
- Ammonia (NH_3) is used in refrigeration, used in ice factory for making ice, manufacturing fertilizers and explosives etc.
- Nitrous oxide (N_2O) is often called as laughing gas. It is used as an aesthetic by dentists
- Phosphorus is an essential constituent of bones, teeth, blood and nerve tissues. Red phosphorus used in safety matchsticks
- Sulphuric acid (H_2SO_4) is also known as oil of vitriol or king of chemicals. It is used in batteries, refining of petroleum etc.
- Hypo (Sodium Thiosulphate) is strong Complexing agent. It is mainly used in photography as a fixing agent. It is also used for removing excess chlorine in bleaching industry.
- Helium (He), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe) and radon (Rn) are known as inert gases or noble gases.
- The mixture of helium and oxygen is used for artificial breathing of asthma patients.
- Helium is used for filling in balloons because it is lighter than air and oxygen and it also non-combustible.
- Mixture of helium and oxygen is used for respiration by sea divers. Xenon (Xe) It is called stranger gas
- Helium is used as pressuring agent in rockets to expel liquid oxygen and liquid hydrogen.
- A mixture of argon with 15% nitrogen is filled in electric bulb. The gas usually filled in an electric bulb is Nitrogen.
- Brass gets discolored in the air due to the presence of hydrogen sulphide.

- Best conductor of Electricity – **Silver**.
- Least Reactive metal – **Gold**
- Best Ductile and Malleable metal – **Gold**
- Most Reactive metal – **Potassium** (it is kept in Kerosene Oil)

ALLOYS – Mixing of two or more metals is called Alloys. Alloys is a homogeneous mixture. Some important alloys are –

- **Solder** – Tin + Lead = making fuses and joint the electrical equipment's.
- **Bronze** – Copper + Tin = Utensils, statue, coins
- **Type Metal** – Lead + Antimony + Tin = Used in printings
- **Gun metal** – Copper + Tin + Zinc = Gears and bearings
- **Brass** – Copper + Zinc = Utensils, Condenser, AC Parts and Ship parts.
- **German Silver** – Copper + Zinc + Nickel = Utensils, resistance wires
- **Stainless Steel** – Iron + Chromium + Nickel = Utensils, Bike Parts, Surgical items etc.

ORGANIC COMPOUNDS CHEMISTRY –

- First organic compound was Urea. It was built by Wohler (German Chemist, 1828). Urea contains 46% Nitrogen.
- Cow dung can be used as manure because it rich in Nitrogen.
- Methane (CH_4) is colorless, odorless gas. It is also known as **Marsh Gas** or fire damp. Rice paddies agriculture is a big source of atmospheric methane. In coal mines explosion occurs due to methane gas. Methane is main constituent of **Biogas**. The largest component of natural gas is methane. It is a greenhouse gas.
- Tear Gas (Smoke grenades) are made from Hexachloroethane or ethene.
- Ethylene – It is used as an aesthetic, for the preservation and used in artificial ripening of green fruits.
- Dichloro Diphenyl Trichloroethane (DDT) was discovered by Paul Muller in 1939.
- Ethylene Glycol (CH_2OH)₂ is used at coolant in automobiles and airplanes instead of water.
- Glycerin is used in the manufacture of cosmetics and transparent soaps. Used as a lubricant for watches and clocks.
- Methyl Alcohol or Methanol is known as wood spirit or wood alcohol. It is very dangerous for human consuming. If a person consumes it, he will blind immediately and causing death also. Fake liquor (Nakli Sharab) is made from it.
- Ethyl Alcohol is used in alcoholic beverages (Sharab). It is produced by the fermentation of sugars by yeasts.
- Deodorants contains salts of aluminum, iron and zinc.
- Talcum Powder contains carbonates of calcium and magnesium, oxides of titanium, zinc and magnesium talc and metallic soaps and boric acid

CHEMISTRY IN MEDICINE –

- **Analgesics** – These are used to reduce pain (pain killing drugs). e.g., Aspirin, Paracetamol, morphine, Heroine etc.
- **Antipyretics** – These are used to reduce body temperature during high fever. e.g., paracetamol, aspirin, phenacetin etc.
- **Tranquilizers** – These are used to treat stress, anxiety, mild and severe mental diseases. These are also called psychotherapeutic drugs (sleeping drugs). e.g., equanil, valium, veronal, serotonin, chlordiazepoxide, meprobamate etc.
- **Antiseptic** – They prevent the growth of microorganisms or kill them, but are not harmful to living tissues. e.g., Dettol, savlon, iodine tincture, boric acid, hydrogen peroxide etc. Iodine is a powerful antiseptic mixed with alcohol water to form tincture of iodine. Dettol is a mixture of chloroxylenol and terpineol. Boric Acid is used for eyes.
- **Antibiotics** – These are obtained from microorganisms and used to destroy the other microorganisms. e.g., penicillin, ampicillin, ofloxacin, chloramphenicol, tetra cycline. **Penicillin** was first Antibiotics discovered by Alexander Fleming in 1929.
- **Antacids** – These are used as remedies for acidity. e.g., magnesium hydroxide, sodium bicarbonate (baking soda) etc.
- **Antimalarials** – These are used to treat malaria. e.g., Quinine. Quinine is obtained from Cinchona tree bark.
- **Disinfectants** – These are used only on non-living things. Chlorine is used to purify water. Phenol, Formaldehyde (HCHO), Potassium permanganate, ozone, alcohol are some common disinfectants

GLASS – It is a supercooled liquid of silicates or sand (SiO_2). Glass was first discovered by Mesopotamia Civilization.

- The main ingredient of glass is Silica. 72% silica, 15% soda, 10% lime, and 3% other impurities.
- **Soda Glass** – Cheapest glass. Contains sodium carbonate, calcium carbonate and silica. Can be easily attacked by chemicals. Window glass, bottles, dishes, tube lights, domestic utensils etc.
- **Potash glass or hard glass** – Contains carbonate of Potassium, Calcium and silica. High temperature resistant and high chemical resistant. Used in Hard boiling glass test tubes, beakers, etc.
- **Photochromatic glass** – Protect from Ultra Violet (UV) Rays. Used for Eye lenses and goggles
- **Pyrex glass** – Contains borax and silica. Used for making Laboratory equipment's.
- **Flint glass** – Contains sodium, potassium and lead silicate. Due to high refractive index, it is used in Optical instruments like lens of camera, prisms, microscopes, telescope and in electric bulbs.

- **Crown glass** – Contains oxides of potassium, barium and silicon. Used to making Optical instruments.
- **Jena glass** – Best form of glass. Contains zinc and barium borosilicate. Due to strongness and high resistant to acids and alkalis, it is used in Bottles for keeping acids and alkalis in laboratory.
- **Crook's glass** – Used in Eye lenses used in different eye defects. Contains mainly cerium oxide (CeO_2).
- **Lead crystal glass** – Very expensive glass. Used for making various ornamental items, jewellery, costly glass containers
- **Quartz glass or silica glass** – Ultraviolet rays emerge out through it. Used for making bulb of ultraviolet lamp.

CEMENT or PORTLAND CEMENT – Joseph Aspdin (England) first invent cement in 1824. Cement contains Calcium oxide (60-70%), Silica (20-25%), Alumina (5-10%), Ferric Oxide (2-3%) and Magnesium oxide (2-3%).

- **Mortar** – A mixture of sand, cement and water is called mortar and is used for joining bricks and plastering walls.
- **Concrete** – A mixture of gravel, sand, cement and water is known as concrete. It is used for flooring and making road.
- **Reinforced Concrete** – Concrete with steel bars and wires is called reinforced concrete and is used for constructing roofs, bridges and pillars.

PLASTICS or POLYMERS – Tar, Lac are natural plastic. Synthetic or chemical plastics has two types –

- **Thermoplastic** – Polymers which can be easily softens on heating and hard after cool. e.g., polythene, polystyrene, polyvinyl chloride (PVC), Teflon etc.
- **Thermosetting Plastics** – Polymers which undergo permanent change on heating and can't be reused again after broken. e.g., Bakelite, Melamine, Terylene etc.
- Some important facts about plastics –
- **Polythene** is most common polymer. Used in polybags, wire insulation, and squeeze bottles of sauce, dustbins etc.
- In industries Polythene is prepared by the polymerization of Ethylene
- **Teflon** or Polytetrafluoroethylene is used for Nonstick surfaces of kitchenware, plumbing tape etc.
- **Polyvinyl chloride (PVC)** is used for pipes for electrical and water fittings, synthetic leather etc.
- **Polystyrene** is used for making Thermocol, Radio, TV and videocassettes cabinets and cases, combs etc.
- **Lucite** is used for making contact lenses.
- **Bakelite** is used for electrical switches, plugs, handles, combs etc.
- **Polyacrylonitrile** is used for knit shirts, sweaters, blankets, and carpets etc.
- **Melamine formaldehyde resin (Melmac)** is used for making plastic crockery, unbreakable cups and plates etc.
- **Polyvinyl acetate (PVA)** is used for Adhesives (Elmer's glue), paints, textile coatings, and chewing gum etc.
- **Polychloroprene** (neoprene rubber) is used for Oil and gasoline resistant rubber.
- **Lexan or polycarbonate** used for making bulletproof windows and safety helmets
- **Kevlar** is used for making bulletproof vests and jackets.
- **Polyurethanes** is used for making washable and long-lasting mattresses, cushions
- **Paints** is made from Zinc oxide, white lead and titanium oxide with binder, solvent, pigment and additives.
- Urea formaldehyde resin is used for laminated sheets.
- **RUBBER** – It has two types – Natural and Synthetic. Britishers planters introduced natural rubber in India.
- Natural rubber is obtained from latex of the rubber trees
- India's 1st Synthetic Rubber Plant was setup in India at Panipat in 2013 with help of Taiwan.
- School rubber erasers is made from Vinyl Rubber.
- Synthetic rubbers are Neoprene, Buna-S, Buna-N and Thiokol
- Neoprene rubber is used for manufacturing conveyor belts, gaskets, hoses, electrical cable etc.
- Buna-N rubber is used in making oil seals, tank lining etc.
- Buna-S rubber or Poly Styrene-butadiene is used in making bubbles gums.
- Thiokol rubber is used to prepare solvent storage tank, pipes of carrying crude oil etc.
- **Vulcanization of Rubber** – Natural rubber is soft and sticky but to give strength it vulcanized. Natural rubber is cross-linked with Sulphur to increases elasticity and durability. If vulcanized with 5% Sulphur, it is used for making tires and if with 30% Sulphur, it is used in making battery cases.
- In Tubeless Tyre an inner lining of impermeable halo butyl and the rim of the wheel form an airtight seal
- **Fibers** are natural and artificial. Silk, Cotton, Wool, jute, hemp is natural while Rayon, nylon, Polyester, Acrylic are synthetic.
- **Cotton** obtains from Wood Cellulose of cotton plant. Cotton is kharif crop.
- **Silkworm** found mainly on Mulberry (Shatoot) tree. Sericulture is known as cultivation of silk. Silk obtained from Silkworm's cocoon (larva). Silk yarn obtained out of cocoons spun.

- **Hemp** is obtained from *Cannabis sativa* plant.
- **Jute** Fibre is obtained from the stem of the jute plant. India is jute leading producer in the world.
- **Synthetic Fibers** –
- **Rayon** is artificial fibre prepared from a natural raw material called cellulose (wood pulp) by chemical treatment.
- Rayon is also called artificial silk. It is used to make dresses, home furnishing, carpets, bandages and surgical dressings
- Apart rayon Linen, Jute, Hemp, Ramie and Sisal are also Cellulose Fibre.
- **Nylon** is obtained from petroleum products. Nylon is oldest, strongest and lightest synthetic fibre. It is used for making parachutes, vehicle seat belts, dress, tents, net for fish, ropes, tooth brush etc.
- **Polyester** is obtained from coal and petroleum. If Polyester is mixed with cotton, then it produces the Polycot and if it is mixed with wool, then its produce Polywool.
- **Terylene** is a type of Polyester. Terylene is blended with cotton to make Terycot. It is elastic and but traps heat very fast, not wrinkle easily, easy to wash, resistant to acid and alkalis. Used to make sails in boats, fleece jackets and sleeping bags, bottles, jars, utensils, sheets etc.
- **Acrylic** is used as a substitute of wool. It is also known as cheap wool. can trap heat and absorb water. It is used to making Sweaters, hoodie, shawls, boots, boot lining, hats, gloves, athletic wear, carpeting, blankets, roller brushes

CHEMISTRY IN AGRICULTURE –

- **Pesticides** – Use to kill pests like insects, rodents, fungi and unwanted plants (weeds). But Pesticide cause soil pollution.
- **Insecticides** – chemicals used to control insects. DDT (dichloro-diphenyl-trichloroethane), Aluminium phosphate etc. Nicotine, pyrethrum and neem extracts are natural insecticides. DDT was first insecticide in the world.
- **Fungicide** –Thiram, Bordeaux mixture, Mancozeb, nabam, Benomyl, cycloheximide etc. Sulphur is most common fungicide.
- **Herbicides** – Also known as weed killers. Used to control unwanted plants or weeds. The first widely used herbicide was 2-4-dichlorophenoxyacetic acid or 2-4-D. Atrazine, Benzadox, Benzipram and glyphosate are other examples of herbicides.
- **Rodenticide** – used to kill rats and rodents. Zinc phosphide, Aluminium phosphide, Difethialone etc.
- **Fertilizers** – These are used to increase the fertility of soil by providing nitrogen, phosphorus and potassium to plants. Urea is the best fertilizer contains 46.6% Nitrogen. Other examples of fertilizers are calcium cyanamide or Nitrolim, urea or carbamide, calcium super phosphate or super phosphate of lime

FUELS –

- **Producer Gas** – Carbon monoxide (CO) + Nitrogen (N₂). It is used in iron manufacturing industries.
- **Water Gas** – Carbon monoxide (CO) + Hydrogen (H₂)
- **Natural Gas** – Methane (83-97%) + Ethane (C₂H₆). Natural Gas is also known as Fossil Gas. It is found in petroleum wells.
- Natural Gas is also known as Compressed Natural Gas (CNG). It is used as fuel in vehicles.
- **Liquefied Natural Gas (LNG)** – When Natural Gas is cooled at –162°C (–260°F). it also contains more than 90% methene.
- **Coal Gas** – Hydrogen (H₂) + methane (CH₄) + ethylene + acetylene + Carbon monoxide (CO)
- **Biogas or Gobar Gas** – Methane (CH₄) + carbon dioxide (CO₂) + hydrogen (H₂) + nitrogen (N₂)
- **Liquefied Petroleum Gas (LPG)** – 50% butane, 48% propane, 2% pentane and ethyl mercaptan (for smell)
- Butane gas is also found in cigarette lighters and refrigeration.
- **Coal** is variety form of Carbon. Coal is also known as Black diamond. Coal is also referred as 'buried sunshine' Four types of coal – Anthracite is best quality of coal. It contains 90% carbon, Bituminous (78-83% carbon, most common variety), Lignite or brown coal (70% carbon), Peat (60% carbon). Peat is lowest quality of coal.
- **Petroleum** is also known as Black Gold. Octane Number measure the quality of Petrol. Cetene Number is measuring the quality of Diesel.

POLLUTION – Substances which contaminate and adversely effects on environment, is called pollution.

- Sulphur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide, particulate matter (dust, ash, salt particles), Methane, Lead are primary pollutants. PAN (Peroxyacetyl nitrates), ozone (O₃), aldehyde and Sulphuric acid are secondary pollutants.
- Acid Rain – Robert Angus Smith (Scotland) discovered the acid rain. Sulphur dioxide and Nitrogen oxide dissolve in rain water and create acid rain. Acid rain PH Scale value is less than 5.
- Pneumoconiosis (black lung disease) is caused due to inhalation of coal dust.
- Silicosis due to inhalation of free silica or rock cutting (SiO₂)
- Byssinosis (white lung disease) due to inhalation of cotton fibre dust.
- Diseases caused by Air Pollution – Asthma, Bronchitis, Lung cancer, Ear, Nose infections, Skin Rashes etc.
- Chlorofluorocarbons (CFCs) also called freons. These reduce the concentration of Ozone and deplete it.

- Greenhouse Effect – When sunlight is not reflected back to atmosphere. Methane (CH₄), Carbon Dioxide, Nitrous oxide (N₂O), Chlorofluorocarbons (CFCs), Carbon monoxide (CO), Sulphur dioxide (SO₂) and water vapors are greenhouse gases.
- Water Vapor and Cloud is major greenhouse gas (36-72%). Smog – Smoke + Fog
- Global Warming – Earth temperature is increased due to greenhouse effect is cause global warming.
- Bhopal Gas Tragedy – Occurred on 2-3 December 1984, Methyl Isocyanate (MIC) gas released in Bhopal. More than 30000 persons and millions of animals were died. Company name was Union Carbide (USA Based). Warren Anderson was owner.
- Bio-degradable Waste – which dissolve in environment and they do not pollute. Ex. Wood, Food, Paper, Plant Waste etc.
- Non-Biodegradable substance – which cant dissolve in environment. Ex- Plastic, Glass, Pesticides, Disposal Bags etc.
- Radioactive Pollution – Release of radioactive substances in environment. Chernobyl disaster (than USSR, now Ukraine) in 1987 and Fukushima disaster (Japan) in 2011 occurred.
- Soil Pollution – Insecticides (DDT, BHC), herbicides (NaClO₃, Na₃AsO₃), fungicides (organomercury compounds) and fertilizers are the main source of soil pollution.
- Cholera, diarrhea, dysentery, hepatitis A (Jaundice), typhoid, Lead Poisoning and polio are caused due to water pollution.
- Itai-itai disease is caused due cadmium poisoning.
- Artificial sweeteners are sugar substitutes that are used as alternatives to natural sugars (sucrose). saccharin, aspartame, acesulfame potassium (Ace-K), sucralose, neotame, and advantame are Artificial sweeteners.
- Saccharin's are 300 times sweeter than sucrose. Aspartame is 180 times sweeter than sucrose. Sucralose is 600 times sweeter than sucrose. Alitame is 2000 times sweeter than sucrose
- Drying, Smoking (from burning wood), Freezing, Salting and Pickling, Fermentation, Vacuum Packing, Canning, Sugaring, Pasteurization, Irradiations, Table salt, vegetable oil, Sodium benzoate, Vinegar etc. are some food preservation techniques.
- Adding preservatives is NOT a natural way of food preservation. When we freezing the foods, it stops growth of micro-organisms and preserve foods.

BIOLOGY

- Father of Biology and Zoology – Aristotle (Greece). He was student of Plato and teacher of Alexander.
- Father of Botany – Theophrastus (Greece)

CELL – Cell was discovered by Robert Hooke (1665). Study of cell is called **Cytology**.

- The energy is stored in a cell in the form of ATP (Adenosine triphosphate).
- Cell is the structural and functional fundamental unit of all living organisms
- Cells are organized into tissues, tissues into organs and organs into organ systems
- Cell theory was proposed by M. Schleiden (1838) and T. Schwann (1839).
- The biggest cell on Earth **Ostrich Egg**, Smallest is **Mycoplasma gallisepticum (Bacteria)**.
- Largest Cell in Human Body is Ovum (female gamete) and smallest cell in Human Body is Sperm Cell.
- Longest cell in Human Body is Nerve Cell (Neurons). It has 1 to 1.5 meter long.
- Cell has two types – Prokaryotic and Eukaryotic cell.
- Prokaryotic cell also known as primitive cells. They have lacked a true nucleus. Ex. bacterial cell, blue-green algae etc.
- Eukaryotic cell has complete cell and they having nucleus. Eukaryotic cells are of two types Plant cell and Animal cell.
- Food stored in Plant Cell as **Starch**; Food stored in Human / Animal Cell as **Glycogen**

Structure of cell –

- **Nucleus** – Also known as **Controlling Body of the cell**. DNA is found in it. It controls all the activity of cells.
- **Protoplasm** – The whole fluid present inside plasma membrane is protoplasm. It is jelly-like, colorless, transparent material
- **Cytoplasm** – The liquid that fills the inside of cell. 80% of protoplasm is water. Rest is salt and various organic molecules.
- **Mitochondria** – Also known as **Power House of cell**. It provides energy to cell. It contains DNA, RNA and synthesis ATP.
- **Golgi Bodies** – Also called the **Traffic Police of the cell**. It works as storage, processing and packaging of material.
- **Lysosome** – Also known as **Suicidal Bag of cell**. It is the site of food and Protein digestion
- **Ribosome** – Also known as **Protein Factory of cell**. It is taking part in protein synthesis.
- **Vacuoles** – Also known as **Storage House of the cell**. It is storing toxic metabolic waste.
- **Cell Division** – When cell increased in numbers. It is essential for the growth, development and repair of the body.
- The human body is composed of about 25-40 trillion of cells which form different tissues. (More in males & less in female)

TISSUES – A group of cells or fluid that work together to perform a specific job in the body. Tissues provide structural and mechanical strength and enables the division of Labour.

- In Human and Animal four types of Tissue – Epithelial tissue, Connective tissue, Muscle tissue, and Nervous tissue
- **Epithelial Tissue** – It cover the external surface of the body. Ex. Skin. It protects us microorganisms, fluid loss, injury etc.
- **Connective Tissue** – It provides the structural framework and support to different tissues and helps in the body Defence. Most abundant fibre in connective tissues is collagen. Ligament, cartilage, bone, blood is connective tissue.
- Ligaments connects Bone to Bone, Tendon connects Muscles to Bone
- **Muscle Tissue** – All the muscles of the body are made up of this. There are 640 skeletal muscles in human body.
- Largest muscle of human body – Gluteus Maximus (Hip Muscle)
- Smallest muscle of human body – Stapedius (inside the middle ear)
- Strongest muscle of human body – The Masseter (found in jaw)
- Skeletal and cardiac muscle is not under human will, so it is also called involuntary muscles.
- Movement of limbs, fingers, toes, neck, face expressions, smiles etc. under human will, so it is also called voluntary muscles.
- Cardiac muscle pumping of blood through the heart and rest of body. So, it maintains rhythmicity of heart.
- **Nervous Tissue** – It is found in brain, spinal cord and nerves. Neuron is structural and functional unit of nervous system.
- Nervous Tissue also called sensory tissue. They control all voluntary and involuntary activities of the body

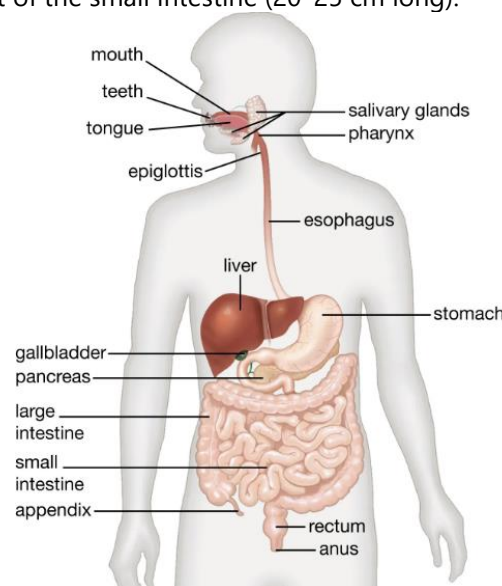
CLASSIFICATION OF KINGDOMS –

- Names of all five kingdoms – Kingdom Animal, Kingdom Plant, Kingdom Protista, Kingdom Monera, Kingdom Fungi.
- Two kingdom classification system proposed by – Carolus Linnaeus
- Three kingdom classification system proposed by – Ernst Haeckel
- Four kingdom classification system proposed by – Herbert F. Copeland
- Five kingdom classification system proposed by – Robert Whittaker
- Six kingdom classification system proposed by – Carl Woese. 6th Kingdom is Kingdom Archaeobacteria (from Monera).

SYSTEM OF THE HUMAN BODY –

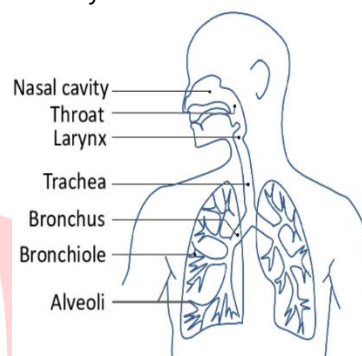
• **Digestive System** –

- The digestive process starts from mouth. Food is broken down by process of chewing by teeth. Saliva is secreted from salivary gland in mouth, which contains enzyme amylase or ptyalin is present. Saliva contains about 99% water.
- Saliva is slightly acidic (pH about 6.8) in nature. Daily production of saliva varies between 0.5 and 1.5 liters.
- Saliva enzyme amylase or ptyalin converts carbohydrates of food to maltose.
- No digestion is taken place in food pipe or oesophagus or Alimentary canal. It is located between mouth and stomach.
- Gastric juice is secreted when food reach the stomach. Food remains in the stomach for 3-4 hours.
- HCl secreted from the stomach kills all the bacteria. Pepsin enzyme breaks down the protein into peptones.
- Renin breaks down Caseinogen into casein found in milk.
- After being processed in the stomach, food enters the duodenum, the first part of the small intestine (20-25 cm long).
- Then it enters the jejunum (2.5 m long) and then the ileum (3 m long) the last part of the small intestine.
- In the small intestine, bile (produced in liver and stored in gall bladder) combine in small intestine, helps in the breakdown of food. Bile juice convert acidic nature of food into alkaline. Digestion of food and fat is completed in small intestine. Small intestine is the longest digestive organ (22 feet or 7 m).
- After passing through the small intestine, food passes into the large intestine.
- The first part of the large intestine is called the caecum (Appendix is connected to the caecum).
- In the large intestine, some of the water and electrolytes (chemicals like sodium) gets absorbed from food.
- Undigested food reaches into last part of large intestine (colon) where bacteria turn it into faeces.
- Absorption – Digested food mixed into blood is called absorption. Use of absorbed food in body is called Assimilation.



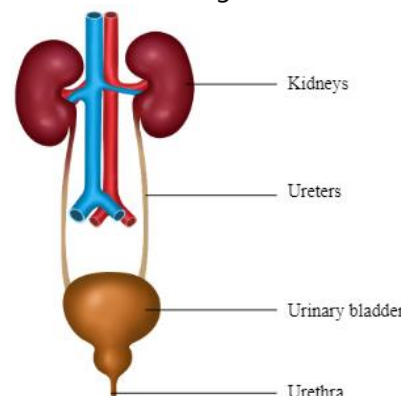
- Absorption of Drugs and Alcohol Water, alcohol, salts and some drugs, e.g., aspirin and moderate amount of sugar are absorbed by stomach. Nutrients like amino acids, vitamin-B complex, vitamin-K, etc. are absorbed in large intestine.
- **Liver** – Largest gland of the human body. Weights is 1500 grams.
- Liver secretes bile juice and store it in gall bladder and also secretes heparin, fibrinogen and prothrombin.
- The blood does not clot inside the body because of the presence of heparin in the blood vessels.
- **Pancreas** – Second largest gland of human body. It can digest carbohydrates, fat and protein so called the complete digestive juice. Pancreas secretes pancreatic juice. Insulin is secreted by β -cells of islets of Langerhans, a part of pancreas.
- Insulin was discovered by Banting and Best in 1921. Diabetes (Sugar) is caused due to the deficiency of insulin.

- **Respiratory System** – The most important organ of the respiratory system is lungs. Total two lungs in human body.
- In Lungs, Oxygen enter into the blood and CO_2 releases out from blood.
- Inspiration – Fresh air takes by lungs (Diaphragm flattened). Expiration – Air breath out by lungs (Diaphragm relax)
- Exchange of CO_2 and O_2 (gases) occurs by wall of lungs called alveoli.
- Transportation of oxygen takes place by blood with help of hemoglobin. 100 mL of pure blood carries 20 mL of oxygen. Minimum require hemoglobin in human is 11 gm/dl.
- Nasal passage prevents the particles of dust, bacteria, virus, pollen etc.
- Inhaled air contains 78% N, 21% oxygen, 0.04% CO_2 and while exhaled air contains 78% nitrogen, 16% oxygen, 4% CO_2 .



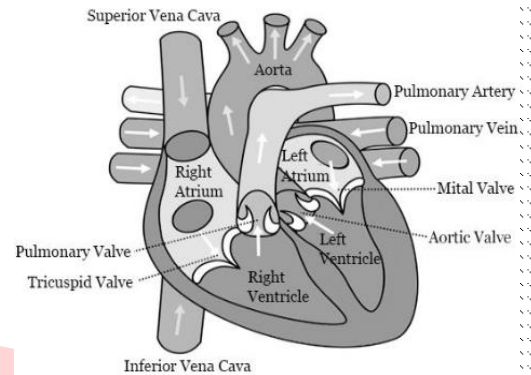
- Medulla Oblongata controlled the Respiration.
- **Respiratory Organs of Some Animals** –
 - Reptiles and Mammals – Lungs
 - Fishes, tadpoles and prawns – Gills
 - Birds – Air sacs/lungs
 - Frogs, earthworms, crabs and leeches – Skin
 - Insects, centipedes and millipedes – Tracheae
 - Protozoa – Body surface

- **Excretory System** –
- Removal of waste product from our body is called excretion.
- The human excretory system consists a pair of kidneys, a pair of ureters, urinary bladder and urethra
- Kidneys – The main excretory system in the human body. Kidney is bean-shaped organs with purplish brown colored.
- The main function of kidneys is purification of blood and it excrete unwanted nitrogenous substance through urination.
- Outer part of kidney is called Cortex and inner part is called Medulla
- The functional and structural unit of the kidney is **Nephron**. About 10 Lakhs (1 million) nephrons in human kidney.
- On an average, 1100-1200 ml of blood is filtered by the kidneys per minute. The amount of the filtrate formed by the kidneys per minute is called glomerular filtration rate (GFR). GFR in a healthy person is 125 ml/minute or 180 liters per day
- Colour of urine is lite yellow due to presence of urochrome. It contains 95% water, 2.6% urea, 2% salt, and 0.3% uric acid.
- pH of urine is 6. So, urine is slightly acidic in nature.
- An adult human secrete about 800 to 2000 milliliters urine per day and 25-30 gm of urea is excreted out per day.
- The kidney stone are composed of calcium oxalate (CaOx) mixed with calcium phosphate (CaP)

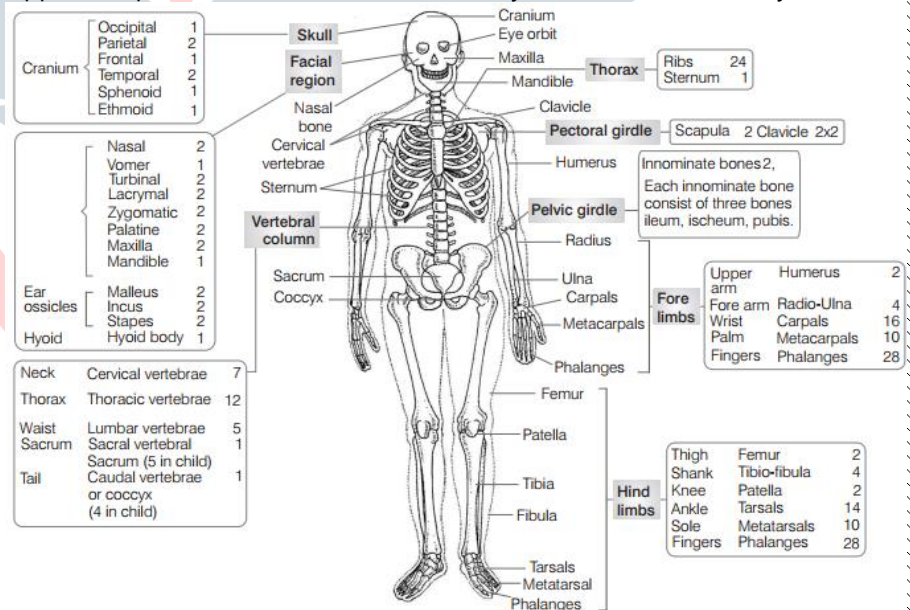


- Dialysis is the process of removal of the excess waste material (urea) from blood. It is also known as **Artificial Kidney**.
- Dialysis process is taken when both kidneys are damaged or non-functional.
- **Other Excretory Organs in Humans** –
- **Lungs** – CO_2 and water vapor eliminated
- **Liver** – Change toxic ammonia or amino acid into non-toxic urea.
- **Skin** – Water, mineral salt, sweat and some nitrogenous wastes are eliminated
- **Intestine** – Undigested food and other excretory materials are eliminated
- **Excretory parts in animals** – Flame cells (in Taenia and Fasciola), Nephridia (in earthworm), Plasmalemma (in Amoeba), Malpighian Tubules (in cockroach), Coxal Gland (in spiders) etc.

- **Circulatory System** – Blood circulation was discovered by William Harvey (England) in 1628.
- The components of human circulatory system are heart, blood, blood vessels (arteries, veins, capillaries) etc.
- **Human Heart** – Heart is a muscular pump. Average weight of heart is 280-340 g (in males) and 230-280 g (in females).
- Heart is the busiest organ in human body. Human heart contains four chambers (Two atriums and two ventricles).
- **Veins** carries impure CO_2 mixed blood (deoxygenated) to heart. Exception is pulmonary vein which always carries pure blood (oxygen-rich blood). It carries blood from lungs to left atrium (heart). Left side of heart has pure blood.
- **Aorta (artery)** carries oxygenated blood from heart towards the all part of body. Aorta is largest artery found in human.
- Exception is Pulmonary artery carries impure blood from right ventricle to lungs. Right side of heart has impure blood.
- Study of heart is called – Cardiology.
- **Heart Attack** – Coronary arteries supply blood to heart muscle. Sudden decrease in coronary blood supply because of blockage is called Heart Attack. Angioplasty or Coronary Artery Bypass Grafting is done by doctors after heart attack.
- **Heart Beat** – Systole and diastole of the heart are collectively called heartbeat. Systolic pressure is 120 mm Hg and Diastolic pressure is 80 mm Hg (but it varies with age). Old age person heart beat is slow. Blood pressure is measured by Sphygmomanometer. Human heart beats 72 times in a minute. Human heart pump 70 ml blood per beat, 5-7 litre in a minute and 7600 litre per day.
- **Electrocardiogram (ECG)** – An electronic device which measures the electrical activity of the heart.
- **Pacemaker** – It is used for help heart beat at a normal rate and rhythm. It is used after heart failure and slow heartbeat.
- Christiaan Barnard (South Africa) performed the first human heart transplant in 1967 at Cape Town, South Africa
- P. Venugopal was first Indian to performed first human heart transplant in India in 1994 at Andhra Pradesh.
- **Skeletal System** – Humans have some hard, supportive, protective elements in their body which form skeletal system.

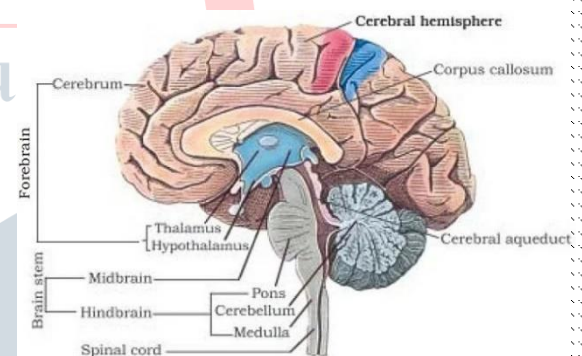


- Human Skeletal System is made up of two parts – Axial and Appendicular. Axial consists 80 bones like skull, vertebral column, ears, back, sternum and ribs. Appendicular skeleton possesses 126 bones, consisting of pectoral & pelvic girdles, bones of arm, legs.
- Bones in skull – 29. (Cranium bones 8, facial bones 14, ear 6 and 1 hyoid). Cranium protects brain and hyoid found in tongue.
- Rib Cage protect Lungs and Heart.
- Cheek bones are called zygomatic bones.
- The vertebral column of man consists of 33 vertebrae. It supports head, base of neck and body, helps in standing and walking, protects spinal cord.



- There are 12 pairs (24) of ribs in human.
- funny bone is found in bend of Elbow.
- Thinnest bone found in legs – Fibula.
- Smallest bone – stapes (found in ear)
- Longest, largest and strongest bone – Femur (found in thigh)
- Total numbers of bones in adult human body – 206. • New Born Baby – 300 bones. Childhood – 270 bones,
- Bones and limestones are made up of Calcium, Protein and Phosphate (Phosphorus).
- **Joints** – Study of joints is called – Arthrology.
- Ball and Socket Joint – Shoulder and Hip Joints
- Pivot Joint – Neck, Wrist, Forearm
- Gliding Joint – Lower leg to ankle joint and Forearm to wrist joint.
- Hinge Joint – Knee, Ankle, Elbow, Fingers, Toes
- Saddle or Sellar Joints – Thumb, Inner Ear

- **Nervous System** – Nervous system is the master controlling and communicating system of the body.
- Study of Nervous system – Neurology. The working of the internal organs of our body is controlled by nervous system
- A person might faint if his heart does not send enough blood to his brain.
- **Neurons or Nerve Cells** – Structural and functional unit of nervous system. They send and receive messages all over body
- **Brain** – Command and control system of human body. Every human activity is controlled by brain.
- Average adult human brain weighs are about 1300 to 1400 grams (3 pounds). Brain is covered by membrane called meninges situated in a box called Cranium. Brain is divided into three parts: **Forebrain, Midbrain, and Hindbrain**.
- Forebrain divided into Cerebrum, Thalamus and Hypothalamus
- **Cerebrum** is the largest part of brain. Cerebrum controls: initiation and coordination of movement, temperature, touch, vision, hearing, judgment, reasoning, problem solving, emotions, and learning. It is responsible for communication (speaking and writing), memory, thoughts and appreciation for music and art.
- **Thalamus** controls the hearing, taste, sight and touch (but not smell).
- **Hypothalamus** controls the Body temperature, Heart rate (Blood Pressure), Hunger, Thirst, Sense of fullness when eating, Mood, Sleep, Love, Hate, Anger, Sweat etc.
- **Midbrain** is located between the thalamus/hypothalamus of the forebrain and pons of the hindbrain. It controls sleep/wake cycle, vision and hearing power of body.
- **Hindbrain** divided into Pons, Cerebellum and Medulla Oblongata.
- Cerebellum is the second largest part of brain. It is also known as little brain. It is the center of the muscular movement.
- **Medulla Oblongata** connect and communicate the brain with spinal cord. It controls heart action, respiration, coughing, sneezing, food swallowing, vomiting etc.
- **Spinal cord** – It is known for reflex action. Spinal cord is about 18 inches (45 centimeters) in length and 2 cm thick. Spinal cord extends from the base of the brain to under the backbone. Spinal cord protects us extremely hot, cold pointed and animals that are scary or poisonous.
- **Reproductive System** –
- Male reproductive organ – Testes. Testes produced the Testosterone hormone.
- Male reproductive egg – Sperm (it produced in testes). Sperm stored around 34°C (below body temperature)
- Female reproductive organ – Ovary. Female reproductive hormones – Estrogen
- Female reproductive egg – Ovum.
- Sperm and ovum form Zygote (fertilized egg). Zygote is an initial stage in baby development
- Fertilization takes place in the Fallopian tube in females.
- Eggs pass from ovary, through the fallopian tubes (oviducts) to uterus (womb). In Uterus development of baby takes place.
- **Embryo** – Early stages of baby development before birth (from 3rd to 8th week of pregnancy).
- **Foetus or Fetus** – After the 8th week of pregnancy embryo is known as Foetus.
- An unborn baby spends around 38 to 40 weeks in the mother womb.
- An unborn baby connects with mother in womb with umbilical cord. Placenta is connected with uterus.
- Delivery of the baby is called **Parturition** (about 280 days or 40 weeks or 9 months).
- Breast feeding to new born baby is called Lactation. Prolactin hormone is necessary for the secretion of milk.
- In Vitro Fertilization (IVF) – Fertilization outside the body due to blockage of oviducts. Also called test-tube babies.
- **Note:** Longest parturition period of African bush elephant (about 22 months) in all mammals.
- **Menstrual Cycle or Menstruation** – This phase begins on the first day of girl period (starts in 10-15 years).
- Average duration of menstrual cycle is every 28 days.
- **Menopause** – End of menstrual cycles in females (stops in 45-50 years of age).
- **Puberty** – The time in life when a boy or girl becomes sexually mature (Girls 8-13 years and Boys 9-14 years).
- **Muscular System** –
- Muscle helps in locomotion, chewing, pull & push and movement etc. Study of muscles is called – Myology
- Total muscles – 639. Lactic acid is formed after muscle fatigue (cramps).
- Largest muscle – The Gluteus Maximus (hip joint) • Smallest muscle – Stapedius (ear),
- Strongest muscle – The masseter (jaw muscle).



- **Human Blood** – Blood is a fluid connective tissue. The quantity of blood in human body is 7 to 8% of the weight of adult.
- There is an average of 5-6 liters blood in an adult. (Approximately 5.5 liters adult male and 4.5 liters in female).
- pH value of blood is 7.35 to 7.45 which means it is slightly bases in nature.
- Blood consists of two parts – **Plasma and Corpuscles**
- **Plasma** – The fluid (liquid) part of blood is called plasma. About 55% of our blood is plasma. Plasma consists of about 92% Water, 7% Protein and 1% contains mineral salts, sugars, fats, hormones and vitamins.
- Fibrinogen, Globulins and Albumins are the major proteins of plasma
- Fibrinogen helps in blood clotting (coagulation).
- Globulins helps in defense mechanisms of the body. It destroying harmful bacteria, viruses and hazardous chemicals etc.
- Albumins maintains the salt and water balance in plasma.
- When Fibrinogen and protein is extracted out from plasma, remaining part is called Serum (plasma without clotting factor)
- Storage organ of the blood – **Spleen** (located behind left ribs, next to stomach)
- **Blood Corpuscles** – About 45% of our blood is **Corpuscles**. It divided into RBC, WBC and Platelets.
- **Red Blood Corpuscles (RBC) or Erythrocytes** – About 4-6 million mm^3 in 1 ml of blood. Lifespan – 120 days.
- New RBC formed in Red Bone Marrow. Spleen is known as graveyard of RBC.
- RBC has red colored due to presence of a protein called hemoglobin.
- The main function of RBC is to carry oxygen from the lungs and deliver it throughout our body.
- **White Blood Cells (WBC) or Leucocytes** – About 4000-11000 mm^3 in 1 ml of blood. WBC is colorless.
- Lifespan of WBC is 12 to 20 days. The main function of WBC protects our body against infections and disease.
- **Platelets or Thrombocytes** – Only found in human and mammals. Platelets formed in bone marrow.
- Average lifespan of Platelets – 7 to 10 days. About 150000 to 450000 platelets mm^3 in 1 ml of blood.
- Main function of Platelets is to prevent and stop bleeding of blood (blood clotting).
- **Blood Groups** – Discovered by Karl Landsteiner (Austria) in 1901. Four blood groups are – A, B, AB and O.
- Where antigen is absent – **Blood Group O** and where antibody is absent – **Blood Group AB**.
- So, Blood Group **O (O^{-ve}) is Universal Donor** and Blood Group **AB (AB^{+ve}) is Universal Acceptor**.
- Rhesus or Rh factor or Rh antigen is a specific type of protein found on the surface of red blood cells (RBCs).
- Rh factor was discovered by Karl Landsteiner and Wiener in 1940 from monkeys.
- After discovery of Rh, 8 blood groups of humans – A+, A-, B+, B-, AB+, AB-, O+ and O-.
- AB negative (AB^{-ve}) is the rarest of the eight main blood types, just 1% of donors have it worldwide.
- O positive (O^{-ve}) is most abundant blood group on earth contains 35% donors worldwide.
- Rh-null is also called the golden blood group, just 50 persons in the world and just 9 active donors.
- Bombay blood group (also called hh or Oh) discovered by Dr. Y M Bhende in Mumbai (then Bombay) in 1952.
- **SENSE ORGANS** – Sense organs receive information from outer environment and send them to brain for processing.
- **Eyes** – The organ for sight. Two in numbers. Light enters in eyes through cornea. After cornea light passes to pupil.
- **Iris** – The iris regulates the size of the pupil.
- **Pupil** – It controls the amount of light entering the eye. It shrinks during very high light and expand in low lights (dark).
- Image formed on retina. It formed inverted image. Our brain processed it to right.
- Cataract (Safed Motia, Motiyabind) and Glaucoma (Kala Motia) are disease of eyes.
- **Ears** – The organ of hearing. Two in numbers. Outer ear is known as Pinna. Maintain balance by inner ear.
- Ear sends electronic signals through auditory nerve to the brain.
- In middle ear Hammer, Anvil and Stirrup are three bones which transmit and amplify the sound waves.
- The inner ear known as Cochlea. It is snail like in shape. The sound vibrations converted into electrical signals by Cochlea, then it sends the sound to the brain.
- **Tongue** – Tongue is responsible for the sense of taste via Taste Buds. Four fundamental sensations of taste are – Sweet and salty tip of tongue), Sour (both sides of tongue), Bitter (back of tongue). Umami is 5th taste of tongue.
- Tongue (in mouth) is the fastest healing body part.
- Parmesan cheese (Italian), seaweed, miso (Japanese spice), chicken and mushrooms are example of Umami taste.
- Cheese is the only animal protein.
- **Nose** – The organ of smell (olfaction). The nose has a dual function are breathing and olfaction. Our nose can identify more than 1 trillion different odours. Dogs can smell 40 times more than humans.
- **Skin** – The organ of touch. It is the largest organ of human body. It is the outer covering of body.

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- Also known as break bone fever.
- Affects whole body
- World first dengue vaccine CYD-TDV (Dengvaxia) by Sanofi Pasteur in 2015. It contains three doses (0, 6 and 12 months)
- Aedes bites at day time (two hours after sunrise)
- Chikungunya, yellow fever, Zika virus is also caused by Aedes mosquito.
- **Polio** – Caused by Polio virus. Largely affects children under the age of 5 years.
- Affects Entire nervous system and caused permanent loss of muscle function (paralysis).
- Inactivated Polio Vaccine (IPV) developed by Dr. Jonas Salk in 1955
- Oral Polio Vaccine (OPV) developed by Dr. Albert Sabin in 1961.
- World Polio Day – 24 October every year. Polio eradicated (ended) in India on 27 March 2014 by WHO.
- **AIDS** – Acquired Immuno Deficiency Syndrome.
- Caused by HIV (Human Immunodeficiency Virus). Affects WBC-CD4 cells of immune system
- Project Sunrise raised awareness about AIDS.
- Test for AIDS – ELISA (Enzyme-Linked Immuno Sorbent Assay)
- Chikungunya, Measles, Herpes, Swine Flu, Ebola, Coronaviruses (COVID-19), Diphtheria, Rotavirus, Japanese Encephalitis, Whooping Cough (Pertussis), Zika also caused by virus. COVID-19 starts from Wuhan (China).
- **Hepatitis-B or Jaundice** – Affects Liver, Bile Juice not produced by Liver.
- Skin and Eyes become yellow.
- Jaundice is a water borne disease.
- Ebola virus was first discovered in 1976 near Ebola River of Congo Republic.
- **Measles** – Affect skin. Caused by Rubella virus.
- **Herpes** – Affects skin
- **Swine Flu** – H1N1 Flu
- **Bird Flu** – H5N1 (Avian influenza)
- **Bacterial Diseases** – Tuberculosis symptoms, Anthrax, Tetanus, Pneumonia, Cholera, Gonorrhea, Bubonic Plague, Syphilis are famous bacterial disease.
- **Meningitis** – Affects brain and spinal cord. Caused by Neisseria meningitis bacteria.
- World first Meningitis Vaccine made by Nigeria (Men5CV vaccine)
- **Tuberculosis (TB)** – Caused by Mycobacterium tuberculosis bacteria. Symptoms: Blood in cough, night sweats, chest pains etc. Mainly affect Lungs and pleura (lining around the lungs). Dr. Robert Koch discovered TB bacteria in 1882.
- TB vaccine (BCG- Bacillus Calmette-Guerin) was discovered by Calmette and Guérin in 1921.
- **DOTS**: Directly Observed Treatment Short-course drug used for TB patients.
- **Typhoid** – Caused by Salmonella Typhi bacteria. These bacteria only lived in humans.
- Affect Intestine. Caused due to contaminated water and food. Widal blood test is used for typhoid bacteria.
- **Cholera** – Water borne disease. Affect Intestine due to contaminated food & water. Caused by Vibrio cholerae bacteria.
- **Pneumonia** – Affect lungs. Caused by Streptococcus pneumoniae or pneumococcus bacteria.
- **Bubonic Plague** – Also known as Black Death. Caused by Yersinia pestis bacteria. Affect lymph nodes (armpits, neck etc.)
- Plague was circulated by small animals like Rats and their fleas. Dr. Waldemar Haffkine developed plague vaccine in 1897
- **Diphtheria** – Affects Throat (swollen neck). Affects children aged 1 to 5 years.
- **Tetanus** – Also known as lockjaw disease. Caused by Clostridium tetani bacteria. Enter in body via cut or wound.
- TT, DT, Td and DTP vaccine given to infected person.
- **Pertussis (Whooping Cough)** – Caused by Bordetella pertussis bacteria. Affect children. Affect Respiratory system.
- **Note**: – DTP (Diphtheria, Tetanus and Pertussis) combined vaccine given to affected children.
- **Leprosy** – Also known as Hansen disease. Affects skin, nerves system and eyes. World Leprosy Day- Last Sunday of January
- **Anthrax** – Caused by Bacillus anthracis bacteria. It affects animals like cows, sheep, and goats, as well as wild herbivores.
- Humans can sick if they contact with infected cattle. Anthrax affects lungs, kidney, and spleen.
- **Trachoma** – Eye infection. Caused by bacterium Chlamydia trachomatis. Blindness from trachoma is irreversible
- WHO recommends SAFE strategy from Trachoma: Surgery, Antibiotics, Facial cleanliness and Environmental improvement.
- **Dysentery** – Caused by Shigella bacteria. Affect intestine (colon)
- **Gonorrhea and Syphilis** are also bacterial disease of male and female reproductive parts causing infertility.
- **Fungi Or Fungus Diseases** – Asthma, Ringworm, Madura foot, Athlete's foot and Dhobie itch (Jock itch) etc.
- **Protozoa Diseases** –
- **Malaria** – Caused by single-celled genus plasmodium parasites. Spread by female Anopheles mosquito.
- Transmission of malarial parasites from mosquitoes was discovered by Ronald Ross in 1897.
- Malaria mosquitoes bite between the hours of 9 PM to 5 AM at night time.

- Anti Malaria drug is obtained from bark of Cinchona tree known as Quinine.
- **Kala Azar (Leishmaniasis)** – Caused by female phlebotomine sandfly.
- **Sleeping Sickness** – Also known as Human African trypanosomiasis. Caused by genus Trypanosoma protozoa.
- Transmitted to humans by bites of tsetse flies (glossina). Gambiense fever are also caused by tsetse flies.
- **Elephantiasis** – Also known as Lymphatic filariasis. Caused by parasitic worms that are spread by mosquitoes.
- **Diarrhea** – Caused by faeces-contaminated water due to shortage of adequate sanitation and hygiene.
- **Pyorrhea** – Plaque build-up along gum lines. Result bleeding gums and teeth.
- **Non-Communicable disease** – Disease which happens due to deficiency of minerals or malfunction of any body part.
- Examples – Cancer, Heart disease, Diabetes, Alzheimer, Color Blindness, Rickets, Beri- Beri, clotting, Asthma etc.
- **Diabetes** – When level of glucose remain high in the blood is caused Diabetes. The body is unable to produce insulin.
- Diabetic person feeling very thirsty (Polydipsia) and urinating frequently. weight loss and loss of muscle bulk frequently.
- **Cancer** – Excessive (uncontrolled) growth of cells is known as Cancer. Study of Cancer: Oncology
- Cancers can be detected by biopsy and bone marrow tests.
- Cryo Surgery (freezing tumors by -20 to -90°C), Proton Therapy, Radiation Therapy (Cobalt-60), Peripheral Blood Stem Cell Transplantation (PBSCT) and Chemotherapy are famous treatment of cancer.
- Leukemia is blood cancer. Tobacco smoke causes lungs cancer.
- **Genetic Diseases** – Also known as hereditary disease. They come from parents to children (Generation to Generation).
- Examples – Color blindness, Diabetes, Hemophilia, Down syndrome, Turner's syndrome, Some types of Cancer etc.
- **Important points about disease** –
- Alzheimer's disease, Parkinson's disease is related with brain disease.
- Minamata Disease related with mercury poisoning.
- Itai-itai Disease is related with Cadmium poisoning.
- Blue Baby Syndrome caused by large amounts of nitrates in water.
- Opiates, Morphine, Codeine, Heroin, Cocaine, LSD (Lysergic Acid Diethylamide) related with drug addict person.
- Bhang, Ganja, Charas (hashish), Marijuana drugs are obtained from Cannabis sativa hemp plant
- Xenon-133 is used to help diagnose lung problems.
- Iodine-131 is used to treatment of thyroid problems. Iodine also controls our body weight.
- Golden hour is related to heart attack. It is a medical treatment will prevent from death.
- Smallpox (1980), Polio (2014), Plague, Rinderpest (the Cattle Plague), Yaws and Maternal & Neonatal Tetanus (2015) disease eradicated from India.

NUTRITIONS –

Vitamins and Minerals –

- Regulates metabolism rate, boost the immune system, support normal growth and development in human body
- Discovered by Casimir Funk in 1912 (father of vitamin therapy).
- Water soluble vitamins – B and C and Fat-soluble vitamins – A, D, E, K.
- **Vitamin A** – Also known as Retinol. Plays an essential role in vision (eyes). Vitamin A is not formed in human body.
- Golden Rice (beta-carotene) is the source of Vitamin A.
- Fish, eggs, and dairy products are best source of this vitamin.
- Disease due to deficiency of Vitamin A – Night Blindness, Xerophthalmia (eye disorder).
- **Vitamin B** – Vitamin B complex consists of eight water-soluble vitamins.
- Thiamine (B1), Riboflavin (B2), Niacin (B3), Pantothenic Acid (B5), Pyridoxine (B6), Biotin (B7), Folic Acid (B9), and Cobalamins (vitamin B12).
- Vitamin B play a vital role in maintaining good health, well-being and give us energy.
- Cereals grain like wheat, rice, rye, oats, barley etc. is best source of Vitamin B.
- Beriberi is caused by deficiency of Vitamin B1 (Thiamine). Polished rice causes Beriberi. Vitamin B12 contains cobalt metal.
- **Vitamin C** – Also known as Ascorbic acid. Found in citric fruits like Amla (best source), lemon, orange, grapes etc.
- Removed after washing, heating and chopping vegetables. Responsible for healing of wounds
- Vitamin C also found in urine. Deficiency disease by Vitamin C – Scurvy (bleeding of gums), poor hair, slow healing of wounds, aching limbs etc.
- **Vitamin D** – Also referred to as Calciferol. Regulate the amount of calcium and phosphate in the body.
- Responsible for Bones and joints strength. Best source – Cod liver oil, egg yolks and sunlight.

- Vitamin D also works as hormone. Vitamin D is most readily manufactured in human bodies.
- Disease deficiency of Vitamin D – Rickets (twisting of bones) in children and Osteomalacia (softening of bones) in adults
- **Vitamin E** – Also known as alpha-tocopherol, beauty or anti-sterility vitamin. Vitamin E also acts as an antioxidant.
- Infertility is caused by deficiency of Vitamin E. Sunflower Seeds, Almonds, Avocado, Peanut Butter best source of Vitamin E
- **Vitamin K** –Also called phyloquinone. Responsible for blood clotting. Hemophilia is caused due to deficiency of Vitamin K
- Vitamin K commonly found in green vegetables like spinach, kale, broccoli, lettuce, etc.
- **Note:** Vitamin A, Folate (folic acid), Iodine, Iron and Zinc are five micronutrients that is must and essential for human body.
- Hidden hunger or micronutrient deficiencies is caused due to deficiency of five essential micronutrients.
- **Proteins** – Proteins are most abundant molecules of humans. Responsible for body growth and repairs muscles.
- Proteins discovered by Jacques Bursailleus (Sweden) in 1838. Name given by Gerardus Johannes Mulder (Dutch).
- Protein in our body – About 16% of body weights (roughly 10 -15%). Protein is also known as polypeptides.
- Each type of protein has a unique sequence of amino acids.
- Best sources of Protein are – Dairy Products, Soyabean, Ground Nut, Pulses, Poultry, Meats, Fish and Seafoods etc.
- Fibrous proteins are insoluble in water Ex. Keratin (present in hair, wool, horn silk, nails) and Myosin (present in muscles).
- Globular proteins are soluble in water Ex. hemoglobin, amylase, insulin etc.
- Trypsin Protein release Enzymes. Almost all enzymes are proteins.
- Antibodies are fights against infections. Almost all antibodies are proteins.
- Deficiency caused by malnutrition of proteins – Kwashiorkor and Marasmus
- **Carbohydrates** – Also known as saccharides or carbs. Provides energy to human body.
- Carbohydrates are the most essential nutrients of human body.
- Carbohydrates in our body – About 1% of body weights.
- Best sources of Carbohydrates – Unprocessed or minimally processed whole grains, rice, vegetables, fruits and beans etc.
- Deficiency caused by malnutrition of Carbohydrates – Hypoglycemia (low blood sugar), Ketosis (fat burns) etc.
- **Fats** – Also called fatty acids or lipids or double carbohydrates means gives double energy to our body.
- Fats acts as emergency nutrient. It helps our body to absorb vitamins. Fats are solids at room temperature.
- Fats in our body – About 12% and 15% in adult male and 25% and 28% in adult female (increased by age).
- Best sources of fats – Ghee, Oil, Almonds, Dairy Products, Meats (poultry products) etc.
- Fats are stored in the human body in adipose tissue (central metabolic organ).
- Fat is also stored by liver in form of glycogen. Camel and bull's stores fat in its hump.
- Fats and Carbohydrates are main source of energy in humans.
- **Important Facts** –
- Growing children need more Proteins. Infants need vitamins & protein to build their bodies and away diseases from body.
- A hard-working laborer who does a lot of physical work needs more carbohydrates and fats to get energy continuously.
- Lips are the only parts of human body where sweat glands are absent. Hence lips don't secrete sweat.
- Calcium, phosphorus, potassium, Sulphur, sodium, chloride, magnesium is known as micronutrients.
- Iron (hemoglobin) provides red colour to blood, deficiency of Iron causes – Anemia. Iron is mainly obtained from Spinach.
- Soft drinks (cold drinks) contain carbon dioxide gas, released when cap is open.
- Whales and dolphins are classified as mammals.
- Legumes Crops like peas, gram, pulses, lentils, beans etc. helps in nitrogen fixation in soils.
- A fibrous outer covering feature helps a coconut fruit to float in water
- Milk is known as complete food. Soyabean is known as complete protein.
- In adult human about 60% of their bodies are water. Normal water is containing Zero calorie (calorie-free).
- Animal like cows, sheep, buffalo etc. can digest plants cellulose but not human.
- Excessive Fluorosis in water causes tooth decay and red & yellow color teeth.
- Deficiency of Iodine caused Goitre disease in throat

ANIMALS AND THEIR YOUNG ONES –

- | | | |
|-------------------------------|--------------------------------|--|
| • Donkey, Horse, Zebra – Foal | • Cat – Kitten | • Bull, Cow, Elephant, Whale, Giraffe – Calf |
| • Dog – Pup, Puppy | • Rabbit – Kit | • Hen – Chicken |
| • Deer – Fawn | • Bear, Fox, Lion, Tiger – Cub | • Sheep – Lamb |
| • Kangaroo, Koala – Joey | • Frog, Toad – Tadpole | • Butterfly – Caterpillar |
| • Duck – Duckling | • Gorilla, Monkey – Infant | • Swan – Cygnet |

- Pigeons – Squabs
- Shark – Pups
- Rats & Mice – Pups (pinkies)
- Cockroach, Grasshopper – Nymph
- Mosquito, Bee – Larva
- Humans, Ape – Baby or Infant
- Crocodile, Alligator, Lizard, Dinosaur – Hatchling
- Penguin, Parrot, Flamingo, Crow, Crane – Chick

• **Note:** Young horses are known as foals, male foals are called colts and females called fillies.

• **HABITAT** – The natural home of a plant or an animal where they live, eats, grows and reproduces is called Habitat.

• The five major habitats are – Forests, Grasslands, Deserts, Mountains, Polar Regions and Aquatic Habitat.

• Forest – Lions and tigers live in caves or dens, birds and monkeys on trees, snakes in holes and rabbits in burrows.

• Deserts – Camels can live without food and water for a long time. Due to this camel is also known as Ship of Desert.

• Polar Regions – Extremely cold weather. Polar bears, Penguin, Seals and walrus are found in the polar regions

• Polar bears have to withstand in the extreme cold in Polar conditions due to his thick fur. They only lived in Arctic Poles.

• Oceans – Largest habitat on Earth. Blue whale, dolphins, octopus, shark, etc. are found here

• Freshwater Habitat – Fishes, frogs found in freshwater. Beluga Sturgeon fish (Russia) is largest freshwater animals

• 'Tadpole' is the larva of Frog.

• Amphibians – Animals that live on both land and water. Frogs, toads, salamanders are famous Amphibians.

ZOOLOGY – The scientific study of animals is called Zoology. Father of Zoology – Aristotle

• **Pisces** – Aquatic life. All are cold blooded animals. Respire by gills. Fins are present. Have internal ears. Ex. Fishes etc.

• **Tetrapoda** – Land life. Limbs are present. Respire by lungs, gills and skin. Heart is three or four-chambered.

• **Amphibia** – Found both on land and water. Respiration through gills, skin, and lungs. Heart has three chambers (two in Pisces) two auricles and in one ventricle. Frog, Nectarous, salamander etc.

• **Reptilia** – Crawling animals, Land vertebrates, two pair of limbs, skeleton is completely flexible, respiration through lungs. Eggs are covered with CaCO_3 , Shell. Ex.- Lizard, snakes, tortoise, crocodile etc.

• Cobra is the only snake that makes nest. It emits its venom through fangs. scientific name is Ophiophagus Hannah.

• Cobra is only oviparous snake means it eat another snake.

• Gibbon Gorilla and Orangutan are ape (Except Langur). Human like ape is Orangutan.

• Orangutans are only found in Indonesia, Malaysia, Borneo and Sumatra

• Heloderma (Gila monster) is the only poisonous lizard. Sea snake called Hydrophiids is the most poisonous snake of world.

• Cockroach has 13 chambered hearts. Cockroach has white blood due to lack of pigment known as hemolymph.

• **Aves** – Warm blooded tetrapod vertebrates with flight adaptation. Forefeet modified into wings to fly. Respire by lungs.

• Birds have no teeth, lower jaw is toothless, Beak help in feeding. Birds lay eggs. Flightless birds- Kiwi and Emus.

• Largest alive bird – Ostrich, smallest is Humming bird. Humming bird is only bird that fly backwards (reverse).

• In Birds Humming bird has highest body temperature 105°F (40.5°C).

• Largest Zoo- Toronto Zoo in Canada (710 acres, 16000 animals and 500 species).

• **Mammalia** – Warm-blooded. Sweet and oil glands are found on skin. Warm blooded, breath through lungs. External ears. Heart divided into four chambers. Skin have hair. Give birth to their young ones. Ex. Humans, cows etc.

• Mammals that lay eggs are known as Monotreme. Ex. Platypus, Echidnas

• In mammals Goat has highest body temperature (39.5°C)

• Seahorses (sea dragons) are the only species in which the male gets pregnant and gives birth (bear young).

• **Scientific Names of Common animals** – 1. Dog – Canis lupus familiars 2. Cat – Felis domesticus, 3. Frog- Anura 4. House fly – Musca domestica 5. Fox – Vulpes 6. Lion – Panthera Leo 7. Rat – Rodentia muridae 8. Indian Cobra – Naja Naja.

• **BOTANY** – The scientific study of plants is called botany. Father of Botany – Theophrastus (Greek naturalist).

• **Algae** – Study of algae is called Phycology. Algae are mostly aquatic (freshwater and marine). Algae has three types- Red, Brown and Green. Green Algae is found in freshwater. Algae is used as food, and in making iodine, as a manure, Mosquito repellent, in making medicines. Algae is also used as a protein food for astronauts in spacecraft. This massive growth of algae is called algal bloom. Cephaleuros virescens (rust of tea), Cephaleuros coffea (parasitic on coffee) are harmful algae.

• **Fungi** – Study of fungi is called Mycology. It is without chlorophyll. Fungi may create serious diseases in plants.

• Mushroom and yeast are fungi that eat by human beings. Fungi is used as Clavacin (anti-cancer drug).

• Lichens are mixture of algae and fungi. Lichens are the first organism which colonize on bare rock.

• **Bacteria** – Discovered by Antoni van Leeuwenhoek in 1676. Ehrenberg named it Bacteria in 1829. Bacteria is also known as probiotics. Bacteria can be both harmful and useful for humans. Some Bacteria cause disease like Typhoid, TB, pertussis, Cholera. Souring of milk, rotting of vegetables (by saprotrophic bacteria), Food poisoning done by harmful bacteria.

- **Benefit of Bacteria** – Used in Nitrogen fixation, Lactobacillus Acidophilus (convert milk into curd), used as scouring, bleaching of fabrics in textile industry, pulp and paper industry for bio-bleaching, in making cosmetics, used in the production of GM crops (Bacillus thuringiensis), antigens for vaccines, in the fermentation of sugars etc.
- Ideonella sakaiensis is known as Plastic eating bacteria made by Japan.
- Penicillin is also obtained from bacteria and Fungus both.
- Louis Pasteur discovered that bacteria are a cause of disease. First bacterial disease discovered by Robert Koch.
- **PASTEURIZATION (STERILIZATION)** – Louis Pasteur invented the process of Pasteurization in 1864.
- **Pasteurization of Milk** – It has three types-
 - High-Temperature Short-Time (HTST) – Milk is heated to 161°F (71.7°C) for 15 seconds, then rapidly cooled. Used in USA.
 - Ultra-High-Temperature (UHT) – Milk is heated to 280°F (137.8°C) for 2 seconds, then rapidly cooled.
 - Vat Pasteurization – Milk is heated to 145°F (62.8°C) for 30 minutes, then rapidly cooled (oldest method)
 - Honey has high concentration of sugar does not decay for long time because bacteria can't survive in a solution in which water is drawn out or very low water. Honey just contains 15-18% water. Honey mainly comes from flowers.
- **Virus** – Study of virus is called Virology. Discovered by Dmitri Ivanowsky (1892) during the tests of mosaic disease on sap of tobacco. Virus required host cells to reproduce. Mostly virus harmful for humans but some are beneficial.
- **Benefit of Virus** – Virus is used as Vaccine development, Gene therapy, Cancer treatment, making pesticides etc.
- Viruses cannot be grown on artificial media (autonomous) but can grow in living cells.
- **FERMENTATION** – Discovered by Louis Pasteur in 1857. It is a metabolic process that converts carbohydrates (such as sugars and starches) into alcohol or organic acids using microorganisms or enzymes such as bacteria, yeast or fungi.
- Fermentation is used to get alcoholic beverages like wine, beer from grape juice, sugarcane, corn in the presence of yeast.
- Ethanol is obtained after fermentation by yeast. It is mixed with petrol and diesel.
- Bacteria involved in Fermentation for making vinegar, dairy products etc.
- Yeast involved in Fermentation for baking bread, biscuits, pizza, cakes, rolls, cookies etc.
- Fungi involved in Fermentation for making cheese. Fermentation also convert sugar in alcohol.
- **MORPHOLOGY** – It is deals with the study and forms of various parts of plants like roots, stems, leaves, flowers, fruits etc.
- **Roots** – Root generally grows in the soil away from sunlight. Monstera, banyan tree roots arise from plant. Roots keeps the plant anchored to the soil, absorbs and transports water to all parts of plant. Cuscuta, Lemna are rootless plant.
- Radish, beet, turnip, carrot, sweet potatoes, Dahlia, Asparagus, Portulaca are example of modified roots.
- Food is stored in the roots of Sweet Potato. Sweet Potato also grows from the roots.
- **Stem** – Ascending, aerial organ of the plant. Potato (tuber stem), Onion (bulb), Garlic, Turmeric, Ginger are some underground stems. Bananas has false stem. Tulips, Lilies, Roses, Strawberry, Mint, Jasmine, Lemon, Grapes, Palm also stem.
- Potato a rich source of carbohydrates.
- The area of the stem where leaves begin to grow is called **Node**.
- Auxin promotes cell growth, development and elongation of the plant.
- **Leaf** – It is green. Its main function is synthesis of food through photosynthesis. Cactus, Acacia leaves convert into spines.
- The pattern of veins in a leaf is called venation. Leaves are known as the lungs of plant.
- **Flower** – It is the reproductive part of plant. Flower contains a stamen (male reproductive organ) and pistil (female reproductive organ) and sepals, petals, and nectar glands.
- Stamen contains anther (pollen sac) and pistil contains stigma, style and ovary.
- Transfer of pollen grains to stigma is called pollination.
- Dispersal of flower seeds (pollen grains) done by wind (air), insects, birds, animals, water etc.
- **Fruit** – It is ripened ovary of flower developed after fertilization. It has three types- Simple, Aggregate, Composite fruits.
- Simple fruits are Apple, Peach, Banana, Cherry, Orange, Guava, Pear, Plum etc.
- Aggregate fruits are Strawberries, Raspberries, Blackberries, Custard Apple etc.
- Composite fruits are Mulberry, Pineapple, Jack fruit etc.
- Apricot and Guava has the maximum protein content.
- Squash, Tomato, Okra (Lady Finger), Pumpkin, Bitter gourd, Cucumber, Sweet peppers or Capsicum (Shimla Mirch), and Peas used as vegetables but actually they are fruits.
- **Seed** – Seed is a fertilized mature ovule that possesses an embryonic plant. The seeds of flowering plants are made up of Embryo, food reserves (Endosperm) and Coat.
- Embryo – Also known as baby plant which grows after germination.

- **Endosperm** – It acts as the food storage. Baby plant get nutrition from it.
- **Coat or Seed Coat** – Protective covering of the seed, made up of the outer (Testa) and inner (Tegmen) layer.
- **Gymnosperm** (Naked seed), **Angiosperm** (covered seed).
- Seeds of drumstick (sahjan) and maple are carried long distances by wind because they possess winged seeds.
- Plant from which cocoa and chocolate is obtained is a shrub. Banana is a shrub. Cloves is obtained from dried flower buds.
- Golden rice contains β -carotene gene which comes from carrot.
- **Cell Wall** – It is found only in plant cell. It provides the structural support and rigidity to plants.
- **Plastid** – Only found in plant cell. It is of three types – Chloroplasts, Chromoplast and Leucoplast
- **Chloroplasts** – Provide Green color to plants. It involves in Photosynthesis. It is also known as **Kitchen of the cell**.
- **Chromoplast** – It provides the various colours to flowers, fruits, leaves, petals etc. Red colour of tomato is due to lycopene.
- Yellow or Orange colour of carrot due to carotene. Red colour of Beetroot due to Betanin or phytolaccamin etc.
- **Leucoplast** – It is colorless and found in underground roots and stems. It's stored the food of plants.
- **Photosynthesis** – It is a process by which green plants are able to manufacture food in the presence of sunlight, CO_2 and water with help of green pigment chlorophyll. Oxygen produces and CO_2 intake by plants in Photosynthesis.
- Photosynthesis converts light energy into chemical energy. Due to the presence of Chlorophyll leaves has green color.
- Photosynthesis is maximum in red light and minimum in green light.
- **Xylem** – It help in the transportation of water and minerals from soil to the stem and leaves. It provides mechanical strength to the plant.
- **Phloem** – It transports organic food in plants. It is the innermost layer of the bark.

CHROMOSOME – It is made up of DNA and proteins. Genes are sections of DNA (deoxyribonucleic acid). Genes are the carriers of the genetic information from generation to generation in humans and animals.

- **Number of chromosomes** – Mosquito-6, Housefly-12, Pea-14, Maize-20, Tomato-24, Frog-26, Cat-38, Wheat-42, Human-46, Potato-48, Chimpanzee-48, Horse-64, Dog-78.

- Ascaris megalocephala (horse round worm) has least chromosomes (only 2), while adder's tongue fern Ophioglossum reticulatum has maximum chromosomes (contains 1440).

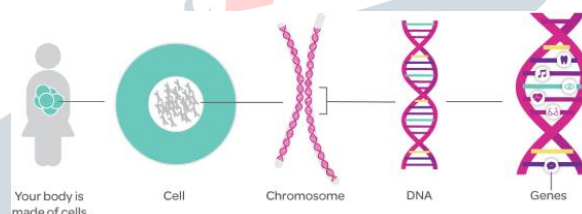
- **Nucleic Acids** – It is present in cells. It has two types – DNA (Deoxyribonucleic Acid) and RNA (Ribonucleic Acid).
- **DNA** – Watson and Crick in 1953 first proposed the structure and model of double helix DNA. Phosphoric acid is main component of DNA. Other is Nitrogen base and sugar.
- **RNA** – It is found mainly in cytoplasm and small amount in nucleus. It contains mainly ribose sugar.

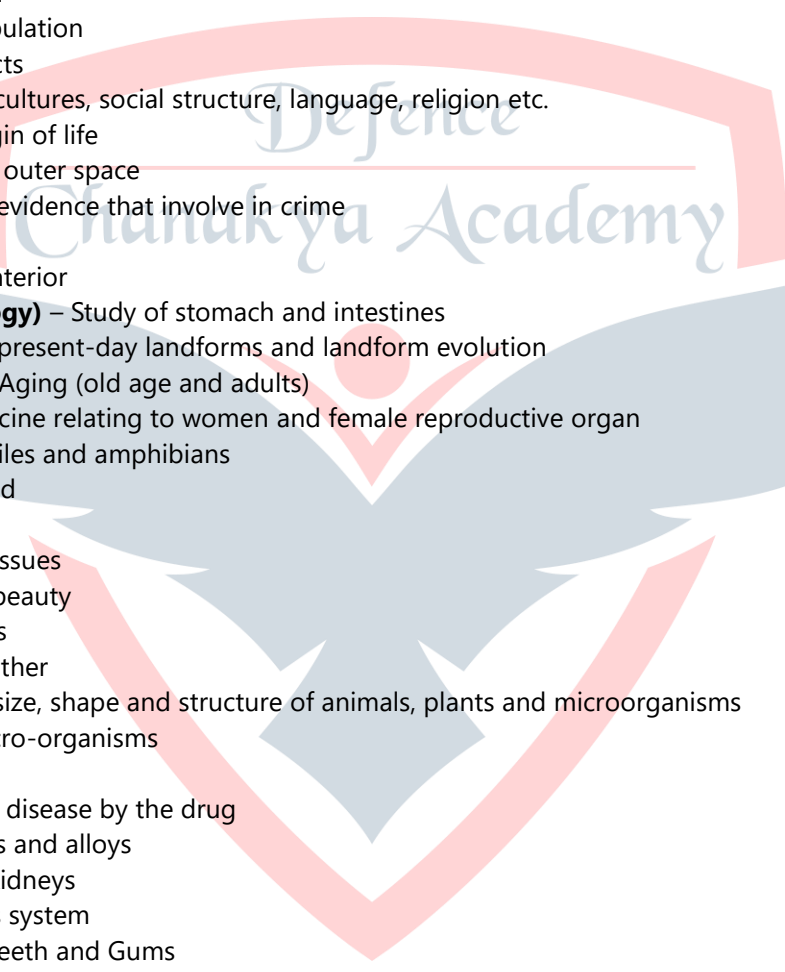
GENETICS – Transmission of characters of an organism from one generation to next generation in the form of gene.

- Father of Genetics – Gregor Johann Mendel. He conducted his experiments with the pea plant.
- In Human male sex chromosome is 'XY' and female sex chromosome is 'XX'.
- In humans 23-pairs of chromosomes. Out of these 22 pairs are exactly similar in both males and females, known as autosomes. Female contains only X-chromosomes and male contains both X and Y-chromosomes.
- During fertilization if male gamete carrying X-chromosome, then new born baby will be female. But if male gamete carrying Y-chromosome, then new born baby will be male. So, in humans' sex is determined only by males.
- **Genes** – Gene is the fundamental unit of heredity (genetics). Chromosomes contains DNA and DNA contains genes.
- Genes are responsible for copy of character generations to generations.
- **Mutation** – Any change in the base sequence in gene is called mutation.

STUDY AND BRANCHES OF SCIENCE –

- **Acoustics** – Study of sound and sound waves
- **Agrostology** – Study of grasses
- **Anthropology** – Study of human
- **Aeronautics** – Study of flying activities
- **Archaeology** – Study of past cultures
- **Arthrology** – Study of joints
- **Anatomy** – Study of the internal structure of human body
- **Anthology** – Study of flowers and flowering plants
- **Astronomy** – Study of Celestial bodies



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- **Astrophysics** – Methods and principles of physics and chemistry in outer space or astronomical objects
 - **Biology** – The science of Life
 - **Botany** – Study of plants
 - **Biometrics** – Study of biological measurement for security purposes (like iris, fingerprint etc.)
 - **Chemistry** – Study of Chemicals
 - **Cardiology** – Study of heart
 - **Cryology** – Study of very low temperatures and related phenomena
 - **Cartography** – Science of making maps and globes
 - **Cytology** – Study of cells
 - **Dendrology** – Study of trees
 - **Dendrochronology** – Study of tree rings and tree age
 - **Dermatology** – Study of skin
 - **Demography** – Study of population
 - **Entomology** – Study of insects
 - **Ethnology** – Study of races, cultures, social structure, language, religion etc.
 - **Evolution** – Study of the origin of life
 - **Exobiology** – Study of life in outer space
 - **Forensic Science** – Study of evidence that involve in crime
 - **Formicology** – Study of ants
 - **Geology** – Study of Earth's Interior
 - **Gastrology (Gastroenterology)** – Study of stomach and intestines
 - **Geomorphology** – Study of present-day landforms and landform evolution
 - **Gerontology** – The study of Aging (old age and adults)
 - **Gynecology** – Study of medicine relating to women and female reproductive organ
 - **Herpetology** – Study of reptiles and amphibians
 - **Hematology** – Study of blood
 - **Hepatology** – Study of liver
 - **Histology** – Study of living tissues
 - **Kalology** – Study of human beauty
 - **Ichthyology** – Study of fishes
 - **Meteorology** – Study of weather
 - **Morphology** – Study of the size, shape and structure of animals, plants and microorganisms
 - **Microbiology** – Study of micro-organisms
 - **Mycology** – Study of fungi
 - **Medicine** – Study of treating disease by the drug
 - **Metallurgy** – Study of metals and alloys
 - **Nephrology** – Study of the kidneys
 - **Neurology** – Study of nerves system
 - **Odontology** – Study of the teeth and Gums
 - **Oncology** – Study of cancer and tumors
 - **Ophthalmology** – Study of the eyes
 - **Ornithology** – Study of birds
 - **Osteology** – Study of bones
 - **Optics** – Behavior and properties of light
 - **Orology** – Study of mountains
 - **Otology** – Study of ear
 - **Oology** – Study of eggs
 - **Physics** – Study of physical phenomena
 - **Paleontology** – Study of Fossils
 - **Philology** – Science and History of language
 - **Pathology** – Study of illness and diseases

- **Pediatrician** – Doctor (medical practitioner) who specializing in children and their diseases
- **Petrology** – Study of rocks
- **Phycology** – Study of algae
- **Physiology** – Study of the functions of living organisms
- **Pomology** – Study of fruits
- **Paedology (Pediatrics)** – Study of children
- **Pulmonology** – Study of diseases of lungs and respiratory tract
- **Pedology** – Study of soil
- **Rhinology** – Study of Nose
- **Seismology** – Study of earthquakes
- **Saurology** – Study of Lizards
- **Somnology** – Study of sleep
- **Taxonomy** – Study of plant, animals and microorganisms' classification.
- **Toxicology** – Study of poisons
- **Trichology** – The study of Hair and scalps.
- **Topography** – study of the shape and features of land surface
- **Traumatology** – Study of wounds and injuries
- **Virology** – Study of viruses.
- **Xylology** – Study of Wood
- **Zoology** – Study of Animals

INSTRUMENTS AND THEIR USES –

- **Anemometer** – It measures Velocity of air or windspeed
- **Actinometer** – Measure the heating power of radiation and sun
- **Altimeter** – Measure Altitude
- **Ammeter** – Electric current
- **Barometer** – Atmospheric pressure
- **Binocular (Durbin)** – To see faraway objects within 10 km
- **Brannock Device** – Measuring shoe size
- **Calorimeter** – Measure heat
- **Caliper** – To measure various dimensions like thickness, outer diameter, inner diameter, length, width of wire
- **Cardiogram** – It measures movement of heart.
- **Cathetometer** – Measuring distances between two points
- **Cinematography** – It is an instrument used in cinema making
- **Crescograph** – Measuring growth in plants
- **Densimeter** – To measure the density of liquids
- **Disdrometer** – Size, speed and velocity of raindrops
- **Endoscope** – To view Internal body parts
- **Fathometer** – To measure depth of sea
- **Galvanometer** – Measure low current
- **Geiger Muller Counter** – Detecting and measuring ionizing radiation in nuclear industry
- **Graphometer** – Measure angles in math and physics
- **Hydrometer** – Gravity of Liquids
- **Hygrometer** – Measures humidity in air.
- **Hydrophone** – It detects underwater sound waves
- **Kymograph** – Record muscular motion, heartbeat, changes in blood pressure
- **Lactometer** – It determines the purity of milk.
- **Microscope** – It is used to obtain magnified view of small objects
- **Manometer** – To measure the pressure of pipelines
- **Multimeter** – Measure multiple electrical properties like volt, ampere, resistance
- **Mariner's Compass** – Instrument used by sailors to identify the direction (compass always point North direction)
- **Microphone** – It converts the sound waves into electrical vibrations.

- **Odometer** – Total distance covered by vehicles
- **Phonograph** – It is an instrument for producing sound
- **Potentiometer** – Measuring electric potential (voltage)
- **Pedometer** – Counting steps of humans
- **Pyrometer** – Measuring very high temperatures like sun
- **Planimeter** – Measuring areas of irregular regions on map or photograph
- **Periscope** – It is used to view objects above sea level (used in sub-marines).
- **Radar** – Used to detect and track aircraft, ships, spacecraft, guided missiles etc. by radio microwaves
- **Seismograph** – To measure Earthquake
- **Speedometer** – To measure speed, velocity of vehicles
- **Spirometer** – Measuring lungs capacity
- **Sphygmomanometer** – Measure blood pressure
- **Stethoscope** – An instrument which is used by doctors to hear and analyses heart and lungs sounds
- **Thermometer** – Measure temperature
- **Tachometer** – Measures the rotation speed (RPM)
- **Tacheometer** – Measuring horizontal and vertical distances on rough and difficult terrain
- **Tintometer** – Measuring intensity of colour in water
- **Thermostat** – Maintaining and regulates the temperature in enclosed area like oven, refrigerator etc.
- **Telescope** – To see distant objects like satellites, planets, stars
- **Wind Vane** – Measuring the direction of wind

