



Indian and World Geography

World Geography

Cosmology Important Facts

- The Universe or the Cosmos, as perceived today, consists of millions of Galaxies. A galaxy is a huge congregation of stars held together by the forces of gravity.
- Edwin Hubble in 1924 first demonstrated existence of galaxies beyond **Milky Way**. He proved that these galaxies are flying away from each other and that the farther they are, the faster they fly. This means that the universe is expanding like a balloon that is being blown up.
- In 140 AD, Ptolemy propounded the theory that the earth was the centre of the universe and the sun and other heavenly bodies revolved around it. In 1543, Copernicus argued that the sun and not the earth was the centre of the universe.
- However, he still equated the universe with the solar system. Kepler supported Copernicus but said that the sun was the centre of the solar system and not the universe. In 1805, Hershel made it clear that the solar system was a part of the much larger system of stars called galaxy.
- Our galaxy is Milky Way Galaxy (or the Akash Ganga). It is spiral in shape. It consists of over a 100 billion stars rotating and revolving about its centre. Nearest galaxy to ours is Andromeda.
- The Big Bang Theory evaluates that 15 billion years ago, cosmic matter (universe) was in an extremely compressed state, from which expansion started by a primordial explosion. This explosion broke up the superdense ball and cast its fragments far out into space, where they are still traveling at thousands of miles per second.

Measurement Units of Space are :

- **Light Year** : It is the distance covered by light in one year in vacuum at a speed of 3×10^8 km/s.
- **Astronomical Unit (A.U)** : It is the mean distance between the earth and the sun. One light year is equal to 60,000 A.U.
- **Parsec** : It represents the distance at which the mean radius of earth's orbit subtends an angle of one second of an arc. It is equal to 3.26 light years.
- Stars are self - luminous bodies that account for 98 per cent of the material in the galaxy. The rest 2 per

cent consists of interstellar or galactic gas and dust in an attenuated form.

- A star's colour indicates the temperature of its surface. **Blue colour denotes maximum temperature**. Then comes yellow, then red, etc.
- The life of a star is spread over billions of years. It begins to form by compression of galactic gas and dust. Compression generates heat which in turn causes hydrogen to be converted into helium in nuclear fusion, thereby emitting large amount of heat and light.
- If the star is of sun's size, it becomes a **White Dwarf**. Their central density can reach up to 10grams per cubic cm.
- If die star is bigger than the sun but not more than twice as big, it will turn into a Neutron Star or Pulsar. Their Central density is 1014 grams per cubic cm. They are formed due to Novae or Super novae explosion.

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- Stars having mass greater than three times that of the sun, because of their great gravitational power, have contracteso much that they have developed super density of 1016 grams per cubic cm. It is so dense that nothing, not even light, can escape from its gravity and hence called '**Black Hole**'.
- Brightest star outside our Solar System is Sirius, also called **Dog Star**.
- Closest star of Solar System is Proxima Centauri (4.2 light years away). Then come Alpha Centauri (4.3 light years away) and Barnard's Star (5.9 light years away).

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Earth Solar System

- Earth solar system consists of :
 - The Sun
 - The Planets
 - Dwarf Planets and countless fragments of left – overs called asteroids, meteors, comets and satellites of the planets (Called small solar system Bodies).

Solar System Some Facts

- **Biggest Planet:** Jupiter
- **Smallest Planet:** Mercury
- **Nearest Planet to Sun:** Mercury
- **Farthest Planet from Sun:** Neptune
- **Nearest Planet to Earth:** Venus
- **Brightest Planet:** Venus
- Brightest star after Sun Sirius
- **Planet with maximum satellites:** Jupiter
- **Coldest Planet:** Neptune
- **Hottest Planet:** Venus
- **Heaviest Planet:** Jupiter
- **Red Planet:** Mars
- **Biggest Satellite:** Gannymede
- **Smallest Satellite:** Deimos
- **Blue Planet:** Earth
- **Morning/Evening Star:** Venus
- **Earth's Twin:** Venus
- **Green Planet:** Neptune

- **Planet with a big red spot:** Jupiter
- **Lord of the Heavens:** Jupiter
- **Greatest Diurnal Temperature:** Mercury

Earth Movement

- The Earth also called Blue Planet. It is the densest of all planets.
- **Earth Circumference :** 40,232 Kilometers.
- **Earth Area :** 510 million Square Kilometers
Average distance from sun: 149 million-Kilometers.
- **Earth Perihelion :** Nearest position of earth to sun. The earth reaches its perihelion on January 3 every year at a distance of about 147 million-Kilometers.
- **Aphelion :** Farthest position of earth from sun. The earth reaches its aphelion on July 4, when the earth is at a distance of 152 million Kilometers.
- The shape of the earth is oblate spheroid or oblate ellipsoid (i.e. almost spherical, flattened a little at the poles with a slight bulge at the centre).

Types of Earth Movements:

1. Rotation or daily movement.
2. Revolution or annual movement.

Earth Rotation

- Spins on its imaginary axis from west to east in 23 hrs, 56 min and 40.91 sec.
- Rotational velocity at equator is 1667 Kilometers/h and it decreases towards the poles, where it is zero.

Earth's rotation results in

- i . Causation of days and nights;
- ii . A difference of one hour between two meridians which are 15° apart;
- iii. Change in the direction of wind and ocean currents;
- Rise and fall of tides everyday.
- The longest day in North Hemisphere is June 21, while shortest day is on 22 Dec (Vice-versa in S. Hemisphere).
- Days and nights are almost equal at the equator.

Earth Revolution

- It is earth's motion in elliptical orbit around the sun. Earth's average orbital velocity is 29.79 Kilometers/s.
- Takes 365 days, 5 hrs, 48 min and 45.51 sec. It results in one extra day every fourth year.
- Revolution of the earth results in
 - i . Change of seasons
 - ii . Variation in the lengths of days and nights at different times of the year
 - iii . Shifting of wind belts
 - iv . Determination of latitudes.

The 4 Earth Seasons are:

- **Spring:** On March 21, the sun is directly overhead the equator. This is the season of spring in the northern hemisphere.
- **Summer:** On June 21, the sun is directly overhead the Tropic of Cancer. Thus, the northern hemisphere experiences summer.
- **Autumn:** On September 23, the sun returns to the equator, and the northern hemisphere experiences autumn.
- **Winter:** On December 22, the sun is at the Tropic of Capricorn, and the northern hemisphere experiences winter.

Earth Latitude and Longitude

Earth Latitude

- Imaginary lines drawn parallel to the equator. Measured as an angle whose apex is at the centre of the earth
- The equator represents 0° latitude, while the North Pole is 90° N and the South Pole 90° S
- $23\frac{1}{2}^\circ$ N represents Tropic of Cancer while $23\frac{1}{2}^\circ$ S represents Tropic of Capricorn.
- $66\frac{1}{2}^\circ$ N represents Arctic Circle while $66\frac{1}{2}^\circ$ S represents Antarctic Circle.
- There are total 181 latitudes including the equator. Each parallel of latitude is a circle, but they are not equal.
- The circle becomes smaller towards the poles. Equator is the 'Greatest Circle' that can be drawn on the earth's surface.
- The distance between any two parallels of latitude is always equal.

Earth Longitude

- It is the angular distance measured from the centre of the earth. On the globe the lines of longitude are drawn as a series of semicircles that extend from the North Pole to the South Pole through the equator. They are also called meridians.
- The distance between any two meridians is not equal. At the equator, 1 degree = 111 km. At 30° N or S, it is 96.5 km. It goes on decreasing this way until it is zero at the poles.
- There are 360 meridians of longitude. The prime meridian is a longitude of 00, passing through the Royal Observatory at Greenwich near London.
- This meridian is taken by geographers to divide the earth into the eastern and the western hemispheres.
- Each meridian of longitude is a semi-circle. 180° meridian (International Date Line) lies exactly opposite to 0° meridian. Such points are called Antipodal Points.
- The earth is divided into 24 longitudinal zones, each being 15° or 1 hour apart in time (4 minutes / degree).

Longitude and Time

- Places that are on the same meridian have the same local (sun) time. Since the earth makes one complete revolution of 360° in 24 hours, it passes through 15° in one hour or 1° in 4 minutes.
- The earth rotates from west to east, hence places east of Greenwich see the sun earlier and gain time whereas places west of Greenwich see the sun later and lose time.
- India, whose longitudinal extent is approx. 30° , has adopted only one time zone, selecting the 82.5° E for the standard time which is 5 hours and 30 minutes ahead of GMT (Greenwich Mean Time).

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International Date Line

- It is the 180° meridian running over the Pacific Ocean, deviating at Aleutian Islands, Fiji, Samoa and Gilbert Islands.
- Travelers crossing the Date Line from west to east (i.e., from Japan to USA) repeat a day and travelers crossing it from east to west (i.e., from USA to Japan) lose a day.

Earth Eclipses

Earth Lunar Eclipse

- When earth comes between sun and moon.
- Occurs only on a full moon day. However, it does not occur on every full moon day because the moon is so small and the plane of its orbit is tilted about 5° with respect to the plane of the earth's orbit. It is for this reason that eclipses do not occur every month.
- This light is red because the atmosphere scatters the other colors present in sunlight in greater amounts than it does red.

Earth Tides

Earth Tides

- Refer to the phenomenon of regular rise and fall of the sea water. Though both sun and moon exert gravitational force on earth, resulting in the production of tides, the moon, by nature of its

closeness to the earth, has greater control over the timings of the tidal rises and falls.

- The interval between two tides is 12 hrs and 26 minutes.

Spring Tide

- When the sun, moon and the earth are in a straight line, the gravitational force is at its greatest because tide producing forces of both sun and moon complement each other and they pull together. This produces tides of unusually great range, called the spring tide.
- These occur about twice a month: at new moon when the sun and the moon are in conjugation and at full moon when they are in opposition.

Neap Tide

- Lowest magnitude as the tide producing forces of sun and moon act opposite to each other, as they form a triangle.
- This happens during phases of first and third quarter, i.e., at half moon, the sun's tide producing force tends to balance the tide producing force of the moon., resulting in tides of unusually small range known as neap tides.

small as 5 km thick in some places beneath the oceans, while under some mountain ranges it extends up to 70 km in depth.

- The crust is made up of two layers- an upper lighter layer called the Sial (Silicate + Aluminium) and a lower
- density layer called Sima (Silicate + Magnesium).
- The average density of this layer is 3 gm/cc.
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The Mantle of Earth

- This layer extends up to a depth of 2900 km.
- Mantle is made up of 2 parts: Upper Mantle or Asthenosphere (up to about 500 km) and Lower Mantle. Asthenosphere is in a semi-molten plastic state, and it is thought that this enables the lithosphere to move about it. Within the asthenosphere, the velocity of seismic waves is considerably reduced (Called 'Low Velocity Zone').
- The line of separation between the mantle and the crust is known as Mohorovicic Discontinuity.
- The Core of Earth
- Beyond a depth of 2900 km lies the core of the earth. The outer core is 2100 km thick and is in molten form due to excessive heat out there. Inner core is 1370 km thick and is in plastic form due to the combined factors of excessive heat and pressure. It is made up of iron and nickel (Nife) and is responsible for earth's magnetism. This layer has the maximum specific gravity.

- The temperatures in the earth's core lie between 2200°C and 2750°C.

Note: Temperature Inside the Earth: In the first 100 km, 12° increase per km. In the next 300 km, 2° increase per km. After that it is 1° increase per km.

Composition of Earth

- Made up of over 100 elements.

The following 8 are important:

- **Oxygen** → 46.5%
- **Silicon** → 27.72%
- **Aluminium** → 8.13%
- **Iron** → 5.01%
- **Calcium** → 3.63%
- **Sodium** → 2.85%
- **Potassium** → 2.62%
- **Magnesium** → 2.09%

Earth Rocks

Rocks of Earth

- Any aggregate of material particles that forms part of the earth's crust is called a rock.

There are 3 major types of rock types :

Igneous Rocks

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Internal Structure of Earth

The Crust of Earth

- It is the outermost and the thinnest layer of the earth's surface, about 8 to 40 km thick. The crust varies greatly in thickness and composition - as

- Formed by the solidification of molten magma from the interior of the earth.
- Most abundant of the three types of rocks (95%).
- All other types of rocks originate from these rocks, thus called Primary rocks.

Sedimentary Rocks

- Made up of weathered remains of igneous rocks. Also contains fossils of plants and animals.
- Comprise only about 5% of the earth's crust but cover about 75% of the total land surface.
- The layers of sedimentary rocks hold all reserve of coal, oil and natural gas.
- Also known as Stratified Rocks because of the layers.

Sedimentary rocks fall into three main groups:

- **1. Mechanically Formed:** These are called clastic sedimentary rocks; the sediments are largely derived from pre-existing rocks that have been broken down and then transported by water, wind or ice to form rocks.
- **2. Organically Formed Rocks:** These rocks are derived from remains of plants (e.g. peat, lignite, bituminous coal), or animals (e.g., chalk and coral).
- **3. Chemically Formed:** E.g., Gypsum, salt rock, etc

Metamorphic Rocks

- Sometimes igneous or sedimentary rocks metamorphose or change due to great pressure, intense temperature or the action of water and chemical activity.

Earthquakes

Earthquakes

- Tremors or vibrations of earth's surface produced by internal forces.
- The point of origin of earthquake is called Seismic focus.
- The point on the earth's surface vertically above the earth's surface is called Epicentre.
- The passage of earthquake waves is recorded by Seismograph.
- The magnitude of waves is measured on Richter's scale. For measurement of the intensity of the earthquake (damage caused), the Modified Mercalli Intensity Scale is used.

Types of Waves Earthquakes

- **1. Primary Waves (P-Waves):** Travel from the point of happening by the displacement of surrounding particles. They are transmitted through solids, liquids and gases. Travels fastest.
- **2. Secondary Waves (S-Waves):** Travels through solids only. Thus they cannot pass through core.

- **3. Surface Waves or Long Waves (L-Waves):** Travels on earth's surface and causes maximum destruction. They are recorded after the P and S waves.

Distribution of Earthquakes

- Around the Pacific Ocean along a belt of volcanoes known as the Ring of Fire. 68 per cent of the volcanoes are experienced in this region.
- From the middle of Asia (Himalayas, Caspian Sea) through the Mediterranean Sea to West Indies. 21 per cent earthquakes are experienced in the region.
- Mid-Atlantic ridge belt which accounts for 11 per cent of the earthquakes

Earth Volcanoes

- A volcano is a vent or opening usually circular in form through which heated materials consisting of gases, water, liquid lava and fragments of rocks are ejected from the highly heated interiors to the surface of the earth.

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Classification of Volcanoes

1. Classification on the basis of Periodicity of Eruptions:

- **Active Volcano:** Volcano which erupt periodically. E.g. Maona Loa in Hawaii, Etna in Sicily, Vesuvius in Italy, Stromboli in Mediterranean Sea, etc.
- **Dormant Volcano:** Volcano which has been quiescent for a long time but in which there is a possibility of eruption. E.g. Fujiyama in Japan, Krakatoa in Indonesia, Barren island Volcano in Andamans, etc.

Distribution of Volcanoes in the World

- About 15% of world's active volcanoes are found along the 'constructive or divergent' plate margins, whereas 80% volcanoes are associated with the 'destructive or convergent' plate boundaries.

Earth Mountains

Types of Mountains

- **Fold Mountains of the World:** They are formed when the rocks of the crust of the earth folded under stress, mainly by forces of compression (as a result of series of earthquakes). **E.g.** – All big mountain systems: Himalayas, Alps, Andes, Rockies, Atlas, etc.

Old Mountains

- They belong to pre-drift era, then subjected to denudation and uplift; many faults were formed; occur as relict mountains today. E.g. Pennines (Europe), Appalachians (US), Aravallis (India).
- **Relict Mountains:** Sometimes, the mountains are carved out as a result of erosion of plateaus & high planes by various agents of erosion. E.g., Highlands of Scotland, Sierras of Spain, Catskill mountains of New York and Nilgiri, Parasnath, Girnar, Rajmahal of India.

Major Mountain Ranges of the World

- **Andes** -South America -6,960
- **Himalayas**→Karakoram-Hindukush -South Central Asia 8,850
- **Rockies** →North America 4,401
- **Great Dividing Range**→East Australia -2,228
- **Western Ghats**→ Western India- 2,637
- **Caucasus Europe,** → -Asia -5,642
- **Alaska** →USA -6,194
- **Alps** →Europe -4,808
- **Apennines** →Europe -2,912
- **Ural** →Asia -1,895
- **Pennines** →Europe -893
- **Pyrenees**→ Europe- 3,404
- **Appalachian** →North America- 2,040
- **Cyclones in World**

- It is a system of very low pressure in the center surrounded by increasingly high pressure outwards.
- In this, the winds blows in a circular manner in Anticlockwise direction in Northern Hemisphere. Clockwise direction in Southern Hemisphere.
- In the temperate region, they occur due to the coming close and imperfect mixing of two masses of air of contrasting temperature and humidity conditions. Cycles of this type are also known as Wave Cyclones or Temperate Cyclones.
- On the other hand, in the tropical regions, they occur due to intense heating up of air in some regions causing very low pressure in these locations. Tropical seas and oceans are most conducive to the development of tropical

cyclones.

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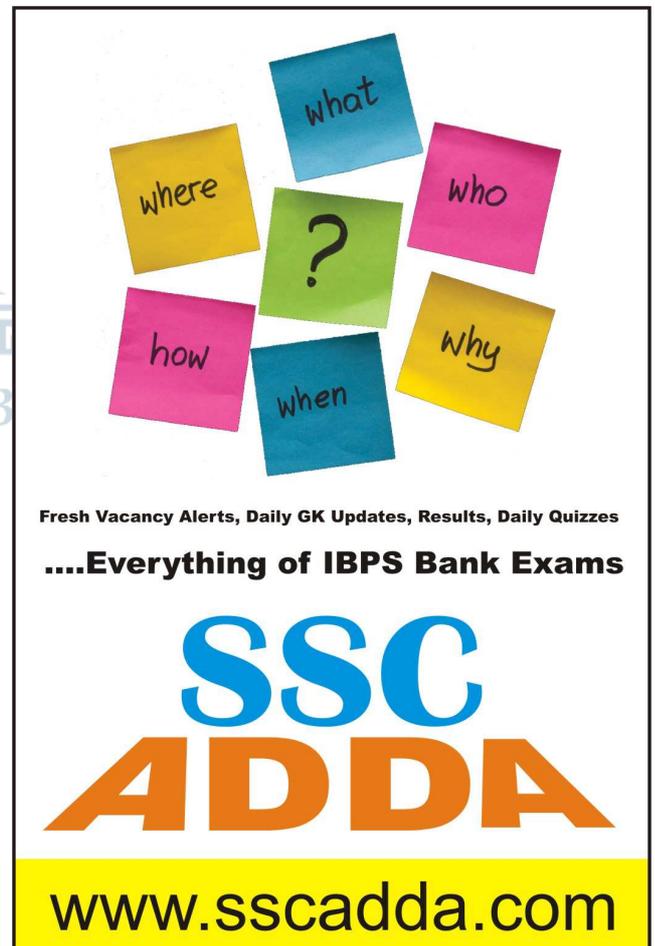
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- **Cyclones** – in the Indian Ocean
- **Hurricanes** – in the Caribbean Islands
- **Typhoons** – in the China Sea
- **Willy-Willies** – in the North West Australia
- **Tornadoes** – in coastal US.
- **Twisters** – in Mississippi Valley, USA

Earth Clouds

- Earth Clouds are masses of minute water droplets and / or ice crystals formed by the condensation of water vapour and
- held in suspension in the atmosphere. Condensation, which results from cooling, usually takes place around nuclei such as dust, smoke particles and salt. Such particles are called condensation nuclei.
- Earth Clouds are of different types and they can be classified on the basis of their form and altitude.



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On the basis of form, there are two major groups:

1. Stratiform or layered types, and
2. Cumuliform or massive types.

Stratiform Clouds

- These clouds, which are fairly thin and blanket like, are sub-divided into three main categories on the basis of altitude.

High Clouds (mean ht 5-13 km)

- **Cirrus Clouds:** Indicates fair weather.
- **Cirrocumulus Clouds:** Forms the mackerel sky.
- **Cirrostratus Clouds:** Produces a halo around sun and moon.

Middle Clouds (mean ht 2-7 km)

- **Alto-cumulus Clouds:** Indicate fine weather.
- **Alto-stratus Clouds:** Associated with development of bad weather.

Low (mean ht up to 2 km)

- **Stratus Clouds:** Brings dull weather, usually accompanied with a drizzle.
- **Nimbostratus Clouds:** If rain or snow is falling from a stratus cloud, it is called nimbostratus.

Riverside Cities - World

City	River	Country
Amsterdam	Amsel	Netherlands
Antwerp	Schelde	Belgium
Baghdad	Tigris	Iraq
Belgrade	Danube	Yugoslavia
Berlin	Spree	Germany
Bonn	Rhine	Germany
Budapest	Danube	Hungary
Cairo	Nilew	Egypt
Glasgow	Clyde	Scotland
Hamburg	Elbe	Germany
Karachi	Indus	Pakistan
Lahore	Ravi	Pakistan
London	Thames	England
Moscow	Moskva	Russia
New York	Hudson	USA
Paris	Seine	France
Quebec	St.Lawrence	Canada
Yangon	Irrawaddy	Myanmar
Rome	Tiber	Italy
Tokyo	Sumida	Japan
Vienna	Danube	Austria
Warsaw	Vistula	Poland
Washington	Potomac	USA

Continents of the World

World Continents

- Asia, Africa, North America, South America, Europe, Australia and Antarctica are the seven continents of the world.
- These seven continents were believed to be part of Pangaea which was a single landmass around 250 million years ago.
- Due to the tectonic movement, the landmass broke up and the component continents separated and moved away to its present position. All these took around 1 million years to complete.

The Continents of the World,

- Asia Continents Countries
- Africa Continents Countries
- North America Continents Countries
- South America Continents Countries
- Europe Continents Countries
- Australia Continents Countries
- Antarctica Continents Countries

Indian Geographical Location

- Lying between latitude 4° N to 37° 6' N and from longitude 68° 7' E to 97° 25' E, the country is divided into almost equal parts by the Tropic of Cancer (passes from Jabalpur in MP).
- The southernmost point in Indian Territory, (in Great Nicobar Island) is the Indira Point (6° 45'), while Kanyakumari, also known as Cape Comorin, is the southernmost point of Indian mainland. The country thus lies wholly in the northern and eastern hemispheres.
- The 82° 30' E longitude is taken as the Standard Time Meridian of India, as it passes through the middle of India (from Naini, near Allahabad).

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Area Geography & Boundaries Geography

- India stretches 3,214 km from North to South & 2,933 km from East to West.
- Geography Area of India : 32,87,263 sq. km. Accounts for 2.4% of the total world area and roughly 16% of the world population.
- Mainland India has a coastline of 6,100 km. Including the Lakshadweep and Andaman and Nicobar Islands, the coastline measures about 7516.6 km.
- In India, of the total land mass:
Plains Geography: 43.3%
Plateaus: 27.7%
Hills: 18.6%

Mountains Geography: 10.7%

- In the South, on the eastern side, the Gulf of Mannar & the Palk Strait separate India from Sri Lanka.
- Total land neighbours: 7 (Pakistan, Afghanistan, China, Nepal, Bhutan, Bangladesh and Myanmar).
- India's Islands include the Andaman & Nicobar Islands in Bay of Bengal and Lakshadweep, Minicoy & Amindive Islands in the Arabian Sea.

The Andaman and Nicobar Group

- Andamans is a group of 204 islands of which the largest is Middle Andaman.
- The Andamans are believed to be extensions of mountains system in the N.E. part of the country.
- Saddle Peak (737 m) in N.Andaman is the highest peak.
- The Nicobars is a group of 19 islands of which the largest is Great Nicobar. Most of them are volcanic in nature.
- Great Nicobar is the southernmost island and is only 147 km away from Sumatra island of Indonesia.
- Volcanic Islands: Barren and Narcondam Islands. Barren is in the process of eruption these days after lying dormant for 200 years.

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The Arabian Sea Group

- All the islands in the Arabian Sea (Total 25) are coral islands and are surrounded by Fringing Reefs (North :Lakshadweep, South: Minicoy).

Important Points

- Ten Degree Channel separates Andamans from Nicobars (Little Andaman from Car Nicobar)
- Duncan Passage lies between South Andaman and Little Andaman.
- Nine Degree Channel separates Kavaratti from Minicoy Island.
- Eight Degree Channel separates Minicoy Island (India) from Maldives.

Rivers of India

- In India, the rivers can be divided into two main groups:
- **1. Himalayan Rivers**
- **2. Peninsular Rivers**

Himalayan Rivers of India

In this three major river systems are there:

The Indus System

- It has a total length of 2880 km (709 km in India). Rises in Tibet (China) near Mansarovar Lake.
- In Jammu and Kashmir, its Himalayan tributaries are: Zaskar, Dras, Gartang, Shyok, Shigar, Nubra, Gilgit, etc
- Its most important tributaries, which join Indus at various places, are: Jhelum (725 km), Chenab (1800 km), Ravi (720 km), Beas (470 km) & Sutlej (1050 km).
- According to the Indus Water Treaty signed between India and Pakistan in 1960, India can utilize only 20% of the total discharge of Indus, Jhelum and Chenab.

The Ganga System

- It is 2525 km long of which 1450 km is in Uttarakhand and UP, 445 km in Bihar and 520 km in West Bengal.
- The Ganga, the head stream is constituted of two main rivers – Bhagirathi and Alaknanda, which combine at Devprayag to form Ganga.
- Before Alaknanda meets Bhagirathi at Devprayag, Mandakini meets Alaknanda at Rudraprayag.
- **Sources:** Bhagirathi from Gaumukh, Alaknanda from Badrinath, Mandakini from Kedarnath (all from Uttarakhand).

The Brahmaputra system

- It has a total length of 2900 km. It rises in Tibet (from Chemayungdung glacier), where it is called Tsangpo, and enters the Indian territory (in Arunachal Pradesh) under the name Dihang.
- **Important Tributaries:** Subansiri, Kameng, Dhansiri, Manas, Teesta.
- In Bangladesh, Brahmaputra is known by the name of Jamuna while Ganga gets the name Padma.

- **Mahanadi River (858 km)** : Rises in Raipur distt. in Chhatisgarh. Main tributaries: Ib, Seonath, Hasdo, Mand, Jonk, Tel, etc.
- **Godavari River (1465 km)** : Also called Vriddha Ganga or Dakshina Ganga. It is the longest peninsular river. Rises in Nasik. Main tributaries: Manjra, Penganga, Wardha, Indravati, Wainganga, Sabari, etc.
- **Krishna River (1327 km)** : Rises in Western Ghats near Mahabaleshwar. Main tributaries: Koyna, Dudhganga, Panchganga, Malprabha, Ghatprabha, Bhima, Tungabhadra, Musi, etc.
- **Cauvery River (805 km)** : It is the largest peninsular river (maximum amount of water). Infact, it is the only peninsular river which flows almost throughout the year. Known as the 'Ganga of the South'.

West Flowing Rivers in India

- **Narmada River (1057 km)** : Has only 1/10th part in Gujarat. Rises in Amarkantak Plateau and flows into Gulf of Khambat. It forms the famous Dhuandhar Falls near Jabalpur. Main tributaries: Hiran, Burhner, Banjar, Shar, Shakkar, Tawa, etc.
- **Tapti River (724 km)** : Rises from Betul distt in MR. Also known as twin or handmaid of Narmada. Main tributaries: Purna, Betul, Arunavati, Ganjal, etc.
- **Sabarmati River (416 km)** : Rises from Aravallis in Rajasthan.
- **Mahi River (560 km)** : Rises from Vindhya in MR.
- **Luni River (450 km)** : Rises from Aravallis. Also called Salt River. It is finally lost in the marshy grounds at the head of the Rann of Kutch.

Riverside Cities - India

City	River	State
Agra	Yamuna	Uttar Pradesh
Ahmedabad	Sabarmati	Gujarat
Ayodhya	Sarayu	Uttar Pradesh
Badrinath	Ganga	Uttarakhand
Cuttack	Mahanadi	Orissa
Delhi	Yamuna	Delhi
Dibrugarh	Brahmaputra	Assam
Haridwar	Ganga	Uttaranchal
Hyderabad	Musi	Andhra Pradesh
Jabalpur	Narmada	Madhya Pradesh
Kanpur	Ganga	Uttar Pradesh
Kolkata	Hoogly	West Bengal
Kota	Chambal	Rajasthan
Lucknow	Gomti	Uttar Pradesh
Ludhiana	Sutlej	Punjab
Nasik	Godavari	Maharashtra
Pandharpur	Bhima	Maharashtra
Patna	Ganga	Bihar

Rajahmundry / Rajamahendri	Godavari	Andhra Pradesh
Sambalpur	Mahanadi	Orissa
Srinagar	Jhelum	Jammu & Kashmir
Surat	Tapti	Gujarat
Tirucharapallil	Kaveri / Cauveri	Tamil Nadu
Varanasi	Ganga	Uttar Pradesh
Vijayawada	Krishna	Andhra Pradesh

Note:

- The largest man-made lake in India is Indira Sagar Lake, which is the reservoir of Sardar Sarovar Project, Onkareshwar Project and Maheshwar Project in Gujarat-MP.
- **Chilka Lake** (Orissa) is the largest brackish water lake of India. Otherwise also, it is the largest lake of India.
- **Wular Lake** (J & K) is the largest fresh water lake of India. Dul Lake is also there in J & K.
- From Sambhar and Didwana Lake (Rajasthan), salt is produced.
- Other important lakes are Vembanad in Kerala and Kolleru & Pulicat in AP.

The three important Gulfs in the Indian Territory are:

- **Gulf of Kutch (west of Gujarat)** : Region with highest potential of tidal energy generation
- **Gulf of Cambay or Gulf of Khambat (Gujarat)** : Narmada, Tapti, Mahi and Sabarmati drain into it.
- **Gulf of Mannar (south east of Tamil Nadu)** : Asia's first marine biosphere reserve.

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Climate Seasons in India

- In India, the year can be divided into four seasons, resulting from the monsoons which occur mainly due to the differential heating of land and movement of the sun's vertical rays.

- The vertical rays of the sun advance towards Tropic of Cancer from mid-March, due to which hot and dry weather arrives. As temperatures rise over most of northern and Central India, a vast trough of low pressure is created. The highest temperature experienced in South is in April while in North it is in May and June.
- This part of the year is marked by a dry spell and the north-western parts of the country experience hot, dry winds, called loo.

Agriculture in India

Cropping Seasons in India

• Kharif Crops of India

- Sown in summers between May and July, and harvested after the rains, in September and October. Eg: Rice, Jowar, Bajra, Maize, Cotton, Jute, Sugarcane, Tobacco, Groundnut, Pulses, etc.

Rabi Crops of India

- Sown at the beginning of winter and harvested before the onset of the summer season, between Feb and April. Eg: Wheat, barley, oilseeds, gram, potatoes, etc.

Zayad Crops

- They are raised between April and June. E.g. : Melon, watermelon, cucumber, toris, leafy and other vegetables.

Cash Crops of India (Commercial Crops)

- Grown mainly for the market, only a small portion of the product is consumed by the farmers themselves (cotton, sugarcane etc).

Important National Park in India

- Kaziranga National Park - **Golaghat/Nagaon (Assam)**
- Manas Tiger Sanctuary - **Barpeta (Assam)**
- Keoladeo National Park - **Bharatpur (Rajasthan)**
- Sundarbans Tiger Sanctuary - **24Paraganas (West Bengal)**
- Bandhavgarh National Park - **Shahdol (Madhya Pradesh)**
- Kanha National Park - **Mandla (Madhya Pradesh)**
- Dudwa National Park - **Lakhimpur Kheri (Uttar Pradesh)**
- Chandraprabha Sanctuary - **Varanasi (Uttar Pradesh)**
- Corbett National Park - **Nainital (Uttarakhand)**
- Rajaji National Park - **Dehradun, (Uttarakhand)**
- Dachigam National Park - **Srinagar (Jammu & Kashmir)**
- Ranthambore Tiger Sanctuary - **Sawai Madhopur (Rajasthan)**
- Ghatprabha Bird Sanctuary - **Belgaum (Karnataka)**
- Bandipur National Park - **Mysore (Karnataka)**
- Gir National Park - **Junagarh (Gujarat)**
- Nal Sarovar Bird Sanctuary - **Ahmedabad (Gujarat)**
- Hazaribagh National Park - **Hazaribagh (Jharkhand)**
- Nelapattu Bird Sanctuary - **Nellore (Andhra Pradesh)**
- Mudumalai Sanctuary - **Nilgiris (Tamilnadu)**
- Periyar Sanctuary - **Idduki (Kerala)**
- Simlipal Tiger Sanctuary - **Mayurbhanj (Odisha)**
- Gahirmatha Turtle Sanctuary - **Kendrapara (Odisha)**
- Vikramshila Gangetic Dolphin Sanctuary - **Bhagalpur (Bihar)**
- Silent Valley National Park - **Palakkad, (Kerala)**
- Rani Jhansi Marine National Park - **Andaman & Nicobar Island**
- Campbell National Park - **Andaman & Nicobar Islands**
- Galathea National Park - **Andaman & Nicobar Island**
- Mahatma Gandhi Marine National Park - **Andaman & Nicobar**

Largest Producers of crops in India

- The largest producer of wheat in India -**Uttar Pradesh**
- The largest producer of sugarcane in India -**Uttar Pradesh**
- The largest producer of groundnut in India -**Gujarat**
- The largest producer of tea in India - **Assam**
- The largest producer of coffee in India -**Karnataka**
- The largest producer of jute in India -**West Bengal**

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- The largest producer of tobacco in India -**Andhra Pradesh**
- The largest producer of bananas in India -**Tamilnadu**
- The largest producer of onion in India -**Maharashtra**
- The largest producer of black pepper in India -**Kerala**

Railways in India

- Indian railway system is the largest in Asia and the fourth largest in the world. It is the biggest departmental public undertaking in the country.
- The first train ran in India between Bombay and Thane, a stretch of 34 km. on April 16 1853.
- The Indian Railways celebrated its 150th anniversary on April 16, 2003. To commemorate the occasion, 16 January – Shatabadi inter – city express trains were announced to be inducted.
- The second train ran between Howrah and Hooghly in 1854.
- The headquarters of Indian Railway is in New Delhi.
- The first electric train in India was ‘Deccan Queen’. It was introduced in 1929 between Bombay and Poona.
- Indian Railways has the second biggest electrified system in the world after Russia.
- The fastest train in India is the Shatabadi Express whose maximum speed is 140 km/hr.
- The total route covered is approx 63,000 km.
- The total number of railway stations in India is 7,100.
- The longest railway platform in India is at Kharagpur (W.B.).
- Mumbai is the destination where maximum number of trains in India head for.
- The longest train route is of ‘Himsagar Express’ from Jammu Tawi to Kanyakumari. It covers a distance of 3,726 km and passes through ten states.
- The first Metro Rail was introduced in Kolkata (W.Bengal) on October 24, 1984. The two stations connected were Dumdum and Belgachhia.
- The Indian Railways operate in three different gauges :
 - 1. Broad Gauge Railway (Distance between rails is 1.67 m).
 - 2. Metre Gauge Railways (Distance between rails is 1.00 m).
 - 3. Narrow Gauge Railways India (Distance between rails is 0.762 or 0.610 m).

Railway Manufacturing Units :

- Chittaranjan Locomotive Works : Located in Chittaranjan (W.B) and manufactures electric engines.

- Diesel Locomotive Works : Located in Varanasi (U.P) and manufactures diesel engines.
- Integral Coach Factory in India : Located in Perambur (TN) and manufactures rail coaches.
- Wheel and Axle Plant : Located at Yalahaka (Bangalore, Karnataka) and manufactures wheels and axles.
- Diesel Component Works : Located at Patiala (Punjab) and manufactures components of diesel engines.
- Rail Coach Factory in India : Located at Kapurthala (Punjab) and manufactures rail coaches.

Road Transport in India

- India’s road network is one of the largest in the world. The total length of roads is more than 33 lakh km. or the purpose of maintenance and construction, roads are classified into National Highways, State Highways, District Highways, Village Roads, Border Roads, etc.
- National highways are maintained by the Central Government, State highways by the respective state government while District highways by the respective District Board. Border roads and International highways are also the responsibility of Central Government.
- The present length of the National Highways in India is approx. 45,000 km. They constitute only 2% of the total road length and carries nearly 40% of the road traffic.



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Some of the Important National Highways are:

- **NH 1:** New Delhi – Ambala – Jalandhar – Amritsar.
- **NH 2:** Delhi – Mathura – Agra – Kanpur – Allahabad – Varanasi – Kolkata.
- **NH 3:** Agra – Gwalior – Nasik – Mumbai
- **NH 4:** Thane and Chennai via Pune and Belgaun.
- **NH 5:** Kolkata – Chennai
- **NH 6:** Kolkata – Dhule
- **NH 7:** Varanasi – Kanyakumari
- **NH 8:** Delhi – Mumbai (via Jaipur, Baroda and Ahmedabad)
- **NH 9:** Mumbai – Vijaywada
- **NH 10:** Delhi – Fazilka
- **NH 11:** Agra – Bikaner
- **NH 12:** Jabalpur – Jaipur
- **NH 24:** Delhi – Lucknow
- **NH 27:** Allahabad – Varanasi
- **NH 28:** Barauni – Lucknow
- **NH 29:** Gorakhpur – Varanasi
- **NH 56:** Lucknow – Varanasi
- **NH – 7** is the longest highway of India

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Airports in India :

There are 12 International Airports in India :

- **Begumpet Airport,** Hyderabad
- **Calicut International Airport,** Calicut
- **Chatrapati Shivaji International Airport,** Mumbai
- **Chennai International Airport,** Chennai
- **HAL Airport,** Bangalore
- **Goa Airport in Vasco da Gama city,** Goa
- **Lokpriya Gopinath Bordolio International Airport,** Guwahati
- **Indira Gandhi International Airport,** Delhi
- **Netaji Subhash Chandra Bose International Airport,** Kolkata
- **Rja Sansi International Airport,** Amritsar

- **Sardar Vallabhbhai Patel International Airport,** Ahmedabad
- **Thiruvananthapuram International Airport,** Thiruvananthapuram

Note:The Indira Gandhi International Airport and the Chatrapati Shivaji International Airport handle more than half of the air traffic in South Asia. Besides these airports several other domestic airports are located in India

Salient Features :

- **Kolkata Port (including Haldia) :** Kolkata is a riverine port, located about 128 km from the Bay of Bengal on the banks of river Hooghly. Haldia was developed because excessive silting prevented the entry of large marine vessels in Kolkata.
- **Paradip Port :** Located on the Orissa coast along the Bay of Bengal. India exports raw iron to Japan from here.
- **Vishakhapatnam Port :** The deepest port, located in Andhra Pradesh. It serves the Bhilai and Rourkela steel plants.
- **Chennai Port :** Oldest artificial harbour. This port ranks only second after Mumbai in terms of the traffic handling capacity.
- **Ennore Port :** Declared a major port in 2001. It is the first port with corporate participation. Provided with all the modern facilities for handling the thermal coal required for Tamil Nadu Electricity Board Power Station.
- **Tuticorin Port :** It came into existence during the reign of Pandya kings. It has an artificial deep sea harbour.
- **Cochin Port :** A fine natural harbour located on Kerala coast. Handles the export of tea, coffee and spices and import of petroleum and fertilisers.
- **New Mangalore Port :** The ‘Gateway of Karnataka’. Handles the export of iron-ore of Kudremukh.
- **Marmugao Port :** It has a naval base. India’s leading iron-ore port.
- **Mumbai Port :** A natural port, India’s busiest. A new port, Nhava Sheva, is being developed near Mumbai port.
- **Jawaharlal Nehru Port :** Occupies the 5th position in the world’s faster growing ports.
- **Kandla Port :** Called the ‘offspring of partition’ as it was developed after the partition as a substitute of Karachi port. It is a tidal port and a free trade zone located in the Rann of Kachchh.

IMPORTANT POINTS

- The first person to use the word geography was – **Erastosthenes (276 – 194 BC)**
- The First presented the India on the world map – **Tolmie**
- 10 latitude give the seperatio of – **111 kms**

- 10 Longitude is equal to – **4” (minutes)**
- The Closest capital to tropic cancer – **Ranchi**
- 3 capitals are above to Tropic of Cancer – **Jaipur, Aizwol, Agarthala**
- The atmosphere layer which reflects radio – waves is known as - **Lonosphere**
- Which State is known as the name of Black Water? -**Andaman and Nicobar**
- Which latitude divides India into two parts? – **23 ½ 0**
- The largest delta in the world is – **The delta of Ganga**
- The type of climate in India is – **Monsoon**
- Most of the iron in India is found in – **Dharwar Rocks**
- Ozone layer is found in – **Stratosphere**
- “Ring of fire” refers to – Circum – **Pacific Seismic belt**
- Willy – Willy is the tropical cyclone occurring in – **Coast of North – west Australia**
- On which river, the Baglihar Hydro- powr project is located? – **Chenab**
- The term Rugur refers to – **Black cotton Soil**
- Which two peninsular rivers flow through troughs? – **Narmad and Tapi**
- How much area does India cover of the total geographical area of the world? – **2.42 %**
- The length of the Indian coastline is **7516.6 km**



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