



**Success is our right. We will definitely succeed!"**

*– Anil Nagar, Founder & CEO, Adda Education*

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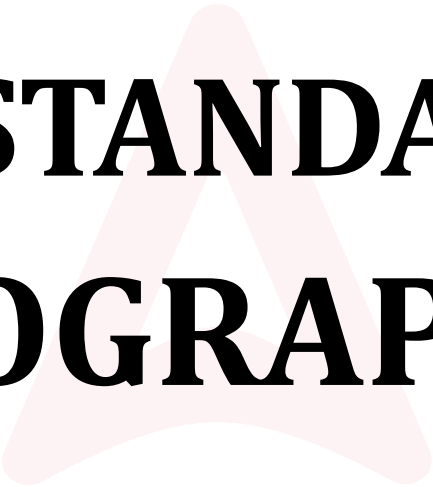
# TNPSC GEOGRAPHY OF INDIA

**Based on Latest Syllabus**

- It Provides all Geographical Concepts easy-to-understand
- Complete study notes for all TNPSC Preliminary & Other Tamil Nadu Competitive Government Exams
- Contents based on NCERT & SCERT Textbooks
- Included 2025 TNPSC Previous Year Questions

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# **6<sup>th</sup> STANDARD GEOGRAPHY**

### The Universe

- The Universe is a vast space containing all celestial objects.
- It is believed to have formed after the Big Bang about 15 billion years ago.
- The Universe contains galaxies, stars, planets, comets, asteroids, and satellites.
- All these objects are called celestial bodies.
- These celestial bodies are very far apart from each other.
- A light year is used to measure distances between celestial bodies.

### The Solar System

- The word 'solar' comes from the Roman word 'sol', meaning Sun God.
- The solar system formed about 4.5 billion years ago.
- It is a gravitationally bound system centered around the Sun.
- The solar system includes the Sun, eight planets, and dwarf planets.
- It also contains satellites, comets, asteroids, and meteoroids.

### The Sun

- The Sun is at the center of the solar system, and all planets revolve around it.
- It makes up about 99.8% of the total mass of the solar system.
- The Sun is made of very hot gases, mainly hydrogen and helium.
- It is a self-luminous star, providing light and heat energy to the solar system, with a surface temperature of about 6,000°C.
- Sunlight takes about 8.3 minutes to travel from the Sun to the Earth.

### The Planets

- The word 'planet' means "wanderer", and there are eight planets in the solar system.
- The planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
- All planets rotate anti-clockwise (west to east) on their axes, except Venus and Uranus.
- Planets move around the Sun in an elliptical path called an orbit due to its gravitational pull.
- The inner (terrestrial) planets—Mercury, Venus, Earth, Mars—are rocky, smaller, and have mountains, volcanoes, and craters.
- The outer (Jovian) planets—Jupiter, Saturn, Uranus, Neptune—are large gaseous giants, and an asteroid belt lies between Mars and Jupiter.

### Mercury (The nearest planet)

- Mercury is the smallest and closest planet to the Sun.
- It is named after the Roman god Mercury, the messenger of the gods.
- Mercury is an airless and waterless planet.
- It has no atmosphere, so it experiences extreme temperatures.
- Mercury has no natural satellites (moons).
- It can be seen with the naked eye during early morning or evening.

### Venus (The hottest planet)

- Venus is the second planet from the Sun.
- It is called Earth's twin because it is almost the same size as Earth.
- Venus has the longest rotation period among planets (243 days).
- It rotates in the opposite direction (retrograde) compared to most planets.
- Only Uranus (also retrograde) shares a similar unusual rotation.
- Venus has no natural satellites (moons), like Mercury.
- It is named after the Roman goddess of love and beauty.
- Venus is often visible in the morning and evening sky.
- Hence, it is called the Morning Star and Evening Star.
- After the Moon, Venus is the brightest natural object in the night sky.

### Earth (The living planet)

- Earth is the third planet from the Sun.
- It is the fifth largest planet in the solar system.
- Earth is called the "blue planet" or "watery planet" because three-fourths is covered by water.
- It is the only planet not named after any Greek or Roman deity.
- Earth is the only known planet that supports life.
- Life exists due to the presence of land, air, and water.
- The polar diameter is about 12,714 km, and the equatorial diameter is about 12,756 km.
- Earth revolves around the Sun at a speed of about 30 km per second.
- The Moon is Earth's only natural satellite.

### Mars (The red planet)

- Mars is the fourth planet from the Sun.
- It is the second smallest planet in the solar system after Mercury.
- Mars is named after the Roman God of war.

- It appears red in colour due to the presence of iron oxide on its surface.
- Hence, it is popularly called the “Red Planet.”
- Mars has a thin atmosphere.
- It has polar ice caps, similar to those on Earth.
- On 24 September 2014, Mars Orbiter Mission (Mangalyaan) reached Mars orbit.
- This mission was launched by Indian Space Research Organisation (ISRO).
- ISRO became the fourth space agency to reach Mars after the Soviet programme, NASA, and ESA.
- Mars has two natural satellites—Phobos and Deimos.
- Many orbiters and rovers have been sent to Mars for scientific exploration.

### **Jupiter (The largest planet)**

- Jupiter is the fifth planet from the Sun.
- It is the largest planet in the solar system.
- Jupiter is named after the king of the Roman gods.
- It is the third brightest object in the night sky after the Moon and Venus.
- Jupiter is the fastest spinning planet.
- It is known as a gas giant planet.
- Its atmosphere is mainly made of hydrogen and helium, like the Sun.
- Jupiter has the largest number of natural satellites (moons).
- Some major moons of Jupiter are Io, Europa, Ganymede, and Callisto.

### **Saturn (The ringed planet)**

- Saturn is the sixth planet from the Sun.
- It is the second largest planet in the solar system after Jupiter.
- Saturn is named after the Roman god of agriculture.
- It is famous for its beautiful ring system.
- The rings are made of ice, rocks, and dust particles.
- Saturn has 62 natural satellites (moons).
- Titan is its largest moon.
- Titan is the only moon with a dense atmosphere, containing nitrogen and methane.
- Saturn’s specific gravity is less than water, meaning it could float in water (theoretically).
- Saturn is a gas giant planet with a thick gaseous composition.

### **Uranus (The somersaulting planet)**

- Uranus is the seventh planet from the Sun.
- It was the first planet discovered using a telescope.
- The astronomer William Herschel discovered Uranus in 1781.
- Uranus appears green due to methane gas in its atmosphere.
- It is named after the Greek god of the sky.
- Uranus rotates on its axis from east to west, similar to Venus.

- Its axis is tilted, making it appear to roll around the Sun like a rolling ball.
- Uranus has 27 natural satellites (moons).
- Titania is the largest moon of Uranus.
- Uranus is classified as an ice giant planet.
- It’s unusual tilt and rotation make its seasons extremely long and unique compared to other planets.

### **Neptune (The coldest planet)**

- Neptune is the eighth and farthest planet from the Sun.
- It is named after the Roman god of the sea.
- Neptune experiences very strong winds.
- It has 14 natural satellites (moons).
- Triton is its largest moon.
- Due to its great distance from the Sun, Neptune is one of the coldest planets.
- The planet has striking blue and white features, making it visually distinct.
- Its appearance helps distinguish Neptune from Uranus.

### **Dwarf Planets**

- Dwarf planets are small celestial bodies found beyond Neptune.
- Dwarf planets are extremely cold and dark.
- They are almost spherical but can share their orbit with other dwarf planets.
- The five dwarf planets in the solar system are Pluto, Ceres, Eris, Makemake, and Haumea.
- Moon is the Earth’s only satellite.
- The Moon revolves around the Earth in 27 days and 8 hours.
- It takes about the same time to rotate on its own axis, so the same side always faces Earth.
- The Moon has no atmosphere and its surface is covered with craters from meteor impacts.
- The distance between the Moon and Earth is approximately 384,400 km, and its size is one-quarter of Earth.
- The Moon is the only celestial body where humans have landed.

### **Asteroids**

- Asteroids are small solid objects orbiting the Sun, mostly found in the asteroid belt between Mars and Jupiter, and are also called planetoids or minor planets.

### **Comets**

- A comet is a celestial object with a head and a tail.
- The head contains solid particles held together by ice, and the tail is made of gases.
- Halley’s Comet is the most famous, appearing near Earth every 76 years (last in 1986, next in 2061).

### **Meteors & Meteorites**

- A meteor is a stone-like or metallic body that burns upon entering the Earth’s atmosphere, often appearing as a streak of light (Shooting Star).

- 71 percent of the Earth's surface is covered by water. The remaining 29 percent consists of land.
- The seven continents are Asia, Africa, North America, South America, Antarctica, Europe, and Australia.
- Asia is the largest continent in the world.
- Australia is the smallest continent.
- There are five oceans on Earth.
- They are the Indian Ocean, the Southern Ocean, the Pacific Ocean, the Atlantic Ocean, and the Arctic Ocean.
- Among these, the Pacific Ocean is the largest, and the Arctic Ocean is the smallest.

### **Mountains**

- Landforms that rise to a height of more than 600 meters are called mountains.
- Major mountain ranges include the Himalayas in Asia, the Andes in South America, and the Rockies in North America.
- The longest mountain range in the world is the Andes, located in South America.
- It stretches approximately 7,000 kilometers from north to south.
- The highest peak in the world is Mount Everest (8,848 meters), located in the Himalayan range.
- December 11th is International Mountain Day.
- The world's highest peak is 'Everest' (8,848 m).
- Hill stations such as Udhagamandalam, Kodaikanal, Kolli Hills, Yercaud, and Yelagiri are located in Tamil Nadu.

### **Plateaus**

- The highest plateau in the world is the Tibetan Plateau. Therefore, the Tibetan Plateau is referred to as the "Roof of the World."
- Since a plateau possesses a flat surface, it is also known as a "tableland." • The Chota Nagpur Plateau, located in India, is a region rich in minerals.
- The Deccan Plateau, situated in South India, is composed of volcanic rocks.
- The Dharmapuri Plateau, Coimbatore Plateau, and Madurai Plateau are the plateaus found in Tamil Nadu.

### **Plains**

- A plain is a landform with an elevation of less than approximately 200 meters above sea level.
- Civilizations such as the Mesopotamian Civilization and the Indus Valley Civilization originated in plains.

- The Gangetic Plain in North India is one of the largest plains in the world.
- River plains served as the cradles of ancient civilizations.
- Civilizations emerged and flourished in river plains, such as those of the Indus River in India and the Nile River in Egypt.

### **Third-Order Landforms**

- Third-order landforms include mountains, plateaus, plains, valleys, coastlines, and sand dunes.
- The Marina Beach in Chennai is an example of a third-order landform.

### **Pacific Ocean**

- The Pacific Ocean is the largest and deepest ocean on Earth.
- It covers one-third of the Earth's total surface area. Its surface area is approximately 168.72 million square kilometers.
- This ocean is triangular in shape.
- The apex of this triangular shape is located at the Bering Strait, which connects the Pacific Ocean and the Arctic Ocean.
- The depth of the ocean is denoted by the symbol 'm'.
- Many islands—including Indonesia, the Philippines, Japan, Hawaii, and New Zealand—are situated in the Pacific Ocean.
- The Mariana Trench (10,994 m), the deepest point on Earth, is located in the Pacific Ocean.
- Due to the continuous chain of volcanoes surrounding the Pacific Ocean, it is known as the "Pacific Ring of Fire."
- Ferdinand Magellan, a Spanish navigator, named it the Pacific. The word "Pacific" means "peaceful."

### **The Atlantic Ocean**

- The Atlantic Ocean is the second-largest ocean on Earth.
- It covers an area of 85.13 million square kilometers. It occupies one-sixth of the Earth's total surface area.
- This ocean resembles the shape of the English letter 'S'.
- The Strait of Gibraltar connects the Atlantic Ocean with the Mediterranean Sea.
- The Milwaukee Deep, located within the Puerto Rico Trench, is the deepest point in the Atlantic Ocean.
- It has a depth of 8,600 meters.

- Several islands—including Saint Helena, Newfoundland, Iceland, and the Falkland Islands—are situated in the Atlantic Ocean.

### **The Indian Ocean**

- The Indian Ocean is the third-largest ocean.
- Its surface area is approximately 70.56 million square kilometers.
- Many islands—including the Andaman and Nicobar Islands, Mauritius, and Réunion—are found within it.
- The Strait of Malacca connects the Indian Ocean with the Pacific Ocean.
- The deepest point in this ocean is the "Java Trench." It has a depth of 7,725 meters.
- Palk Strait: Connects the Bay of Bengal with the Palk Bay
- The 6° Channel separates Indira Point from Indonesia.
- The 8° Channel separates the Maldives from Minicoy Island.
- The 9° Channel
- It separates the Lakshadweep Islands from the Minicoy Island.

- The 10° Channel separates the Andaman Islands from the Nicobar Islands.

### **Southern Ocean**

- The Southern Ocean surrounds the continent of Antarctica.
- Islands such as Farewell Island, Bowman Island, and Heard Island are located within this ocean.
- The majority of this ocean consists of glaciers and icebergs.
- Its maximum depth is 7,235 meters.

### **Arctic Ocean**

- The Arctic Ocean is the smallest of the oceans.
- It covers an area of approximately 15.56 million square kilometers.
- For the majority of the year, this ocean remains frozen.
- Islands such as Greenland, New Siberian Islands, and Novaya Zemlya are situated in this ocean.
- The North Pole is located at the center of the Arctic Ocean.
- The deepest part of this ocean is the 'Eurasian Basin'.
- Its depth is approximately 5,449 meters.



## Asia

- Asia is the largest and most populous continent, covering about 30% of the world's land area and about 60% of the global population, mostly in the Northern Hemisphere.
- It has diverse physical features such as lofty mountains, plateaus, plains, islands, and peninsulas.
- Many perennial rivers flow across Asia, and their valleys were the cradles of ancient civilizations like the Indus Valley, Mesopotamian, and Chinese civilizations.

### Northern Lowlands

#### Siberian Plain

- The Siberian Plain is the largest lowland in Asia, stretching from the Ural Mountains in the west to the Verkhoyansk Range in the east.

### The Central Highlands

- The Central Highlands of Asia extend from Turkey to the Bering Strait.
- Asia has two major mountain knots: the Pamir Knot and the Armenian Knot.

### Mountain Ranges

1. The Plateau of Anatolia lies between the Pontine Mountains and the Taurus Mountains.
2. The Plateau of Iran lies between the Elburz Mountains and the Zagros Mountains.
3. The Plateau of Tibet lies between the Kunlun Mountains and the Himalayas.

## The Southern Plateaus

- The southern plateaus of Asia are lower than the northern plateaus and include the Arabian, Deccan, Shan, and Yunnan Plateaus, with the Arabian Plateau being the largest.

## The Island

- Many important islands along the Pacific coast of Southeast Asia include Kuril, Taiwan, Singapore, and Borneo.
- Major archipelagos in Asia are the Philippines, Japan, and Indonesia, while smaller ones include Maldives and Lakshadweep in the Arabian Sea and Bahrain in the Persian Gulf.
- Sri Lanka is an island located in the Bay of Bengal.

## Drainage

- Most rivers of Asia originate from the central highlands.
- The Ob, Yenisey, and Lena rivers flow northward into the Arctic Ocean and remain frozen during winter.
- South Asia has perennial rivers like the Brahmaputra, Indus, Ganga, and Irrawaddy, which originate from snow-covered mountains and do not freeze in winter.
- The Euphrates and Tigris rivers flow in West Asia, while rivers like Amur, Huang He, Yangtze, and Mekong flow in South and Southeast Asia.
- The Yangtze is the longest river in Asia.

### MAJOR RIVERS OF ASIA

| No. | River          | Source                                | Mouth           | Length (km) |
|-----|----------------|---------------------------------------|-----------------|-------------|
| 1   | Yangtze        | Tibetan Plateau                       | East China Sea  | 6,350       |
| 2   | Yellow River   | Tibetan Plateau                       | Bohai Gulf      | 5,464       |
| 3   | Mekong         | Tibetan Plateau                       | South China Sea | 4,350       |
| 4   | Yenisei        | Tannu-Ola Mountains                   | Arctic Ocean    | 4,090       |
| 5   | Ob             | Altai Mountains                       | Gulf of Ob      | 3,650       |
| 6   | Brahmaputra    | Himalayas                             | Bay of Bengal   | 2,900       |
| 7   | Indus          | Himalayas                             | Arabian Sea     | 3,610       |
| 8   | Amur           | Confluence of Shilka and Argun rivers | Tatar Strait    | 2,824       |
| 9   | Ganga (Ganges) | Himalayas                             | Bay of Bengal   | 2,525       |
| 10  | Irrawaddy      | Northern Myanmar                      | Bay of Bengal   | 2,170       |

## Climate

- Asia has a wide variety of climates due to its vast size and diverse geography.
- Northern Asia experiences very cold, long winters (around  $-37^{\circ}\text{C}$ ) and short, cool summers (about  $10^{\circ}\text{C}$ ), with low snowfall (250–300 mm).
- Northeastern Asia has cold winters, warm summers, and moderate rainfall (50–250 mm).
- South, Southeast, and East Asia are influenced by monsoon winds, with hot, humid summers and cool, dry winters.
- Summer monsoons bring heavy rainfall (1500–2500 mm) to regions like India, Bangladesh, Indo-China, the Philippines, and Southern China.
- Mawsynram in India receives the highest rainfall in the world (about 11,871 mm), making it the wettest place on Earth.

- Equatorial regions of Asia have a uniform climate throughout the year, with no winter, an average temperature of about 27°C, and annual rainfall around 1270 mm.

### **Mineral Resources**

#### **Iron ore**

- Asia has the largest iron ore deposits in the world, with major reserves in China and India, along with countries like Turkey, the Philippines, Malaysia, Thailand, and Myanmar.

#### **Coal**

- Asia has the largest coal deposits in the world, with China and India being the biggest producers.

#### **Petroleum**

- The largest petroleum reserves in Asia are found in South West Asia (West Asia/Middle East), especially in countries like Saudi Arabia, Kuwait, Iran, Bahrain, Qatar, and the UAE, which hold a significant share of the continent's oil wealth.
- Other important petroleum-producing countries in Asia include South China, Malaysia, Brunei, Indonesia, India, and Russia, which also contribute to the region's oil output.
- Saudi Arabia and Iran are among the top countries in the world in terms of proven oil reserves, with Saudi Arabia holding one of the largest reserves globally.

### **கனிமங்கள்**

- Asia has a wide variety of mineral deposits and plays an important role in the production of iron, coal, manganese, bauxite, zinc, tungsten, petroleum, tin, and other minerals.
- Oil and natural gas are found mainly in West Asian countries, and Asia produces about one-third of the world's oil.
- Among the West Asian countries, Iran has considerable wealth of mineral resources including significant petroleum reserves.

#### **Agriculture**

- Only about 18% of Asia's total area is cultivable, but agriculture is the main occupation of the people.
- River valleys in South, Southeast, and East Asia have rich alluvial soil, making them ideal for intensive agriculture.
- Some areas of Asia are not suitable for farming due to climate and soil conditions.
- India has the largest area of arable land in Asia.
- In West Asia, agriculture depends on groundwater availability, rainfall, and rivers such as the Euphrates and Tigris, as seen in Iraq.
- Rice and wheat are the staple food crops of Asia, with China and India being the leading rice producers.

Other important rice-producing countries include Myanmar, Japan, Bangladesh, and Thailand.

- Thailand is called the "Rice Bowl of Southeast Asia" due to its favorable conditions for rice cultivation.
- The Banaue rice terraces in the Philippines were built about 2,000 years ago by the Ifugao people and are located approximately 1,524 m above sea level.
- Wheat is grown in the temperate regions, with Russia, India, China, and Pakistan being the main producers.
- Millets like Bajra, Jowar, Ragi, and Sorghum are cultivated in the drier parts of Asia, especially in India, Pakistan, and some Gulf countries.
- Pulses, spices, and oilseeds are also widely grown across Asia.
- Cotton and jute are major natural fibers cultivated in Asia. India, China, Russia, and Kazakhstan produce most of the cotton, while India, Pakistan, China, and Bangladesh lead in jute production.
- Plantation crops like sugarcane, coffee, tea, rubber, palm, and cocoa are grown in tropical climates, with major producers including India, Indonesia, Philippines, Sri Lanka, Thailand, Vietnam, and Malaysia. Iran is the largest producer of dates in West Asia.

#### **Fishing**

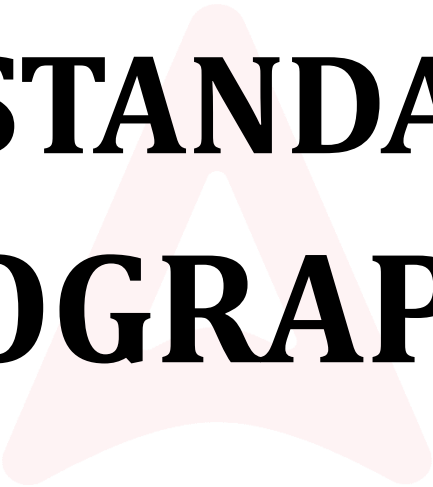
- Fishing is a major economic activity in Asia, with China and Japan as leading fishing nations, important fishing areas like Tonle Sap in Cambodia, the Bay of Bengal, Maldives, and pearl fishing in Bahrain contributing significantly to local economies.

#### **Roadways**

- The Asian Highway network connects Tokyo in the east to Turkey in the west, and Russia in the north to Indonesia in the south, covering a total length of 141,000 km.
- The network passes through 32 countries across Asia.
- Asian Highway 1 (AH 1) is the longest highway in the network, stretching 20,557 km from Tokyo to Turkey.
- Asian Highway 43 (AH 43) runs 3,024 km from Agra in India to Matara in Sri Lanka.

#### **Railways**

- The Trans-Siberian Railway, at 9,258 km, is the longest rail route in the world, connecting Leningrad and Vladivostok.
- The Trans-Asian Railway links Singapore to Istanbul in Turkey, connecting Southeast Asia with Europe.
- Japan's Shinkansen, or bullet train, is a high-speed express train running between Osaka and Tokyo at speeds of up to 352 km/h.
- India has the second-largest railway network in Asia.



# **7<sup>th</sup> STANDARD GEOGRAPHY**

## The Earth's Crust

- Earth is a blue planet. 71% of the Earth's surface is covered by water, while only 29% consists of landmass.
- The outermost layer of the Earth is known as the Crust.
- Its average thickness ranges from 5 to 30 kilometers.
- Its thickness is approximately 35 kilometers in continental regions and 5 kilometers at the ocean floors.
- The oceanic crust is primarily composed of dense rocks, such as basalt.
- The Earth's crust consists of two distinct divisions. The upper part of the continents is composed of granitic rocks. This region is rich in the key mineral constituents of Silica and Aluminum; hence, it is collectively referred to as 'Sial'. Its average density is  $2.7 \text{ g/cm}^3$ .
- The lower part of the crust is composed of basaltic rocks. This region is constituted by Silica and Magnesium as its primary components; therefore, this layer is known as 'Sima'.
- Its average density is  $3.0 \text{ g/cm}^3$ . Together, Sial and Sima form the fundamental structure of the Earth's crust. Since the density of Sial is lower than that of Sima, the Sial-based continents effectively "float" upon it.

## The Mantle

- The layer immediately beneath the Earth's crust is known as the Mantle.
- The boundary separating the Earth's crust from the mantle is known as the Mohorovičić discontinuity (or Moho).
- The Mantle extends to a thickness of approximately 2,900 kilometers.
- The Mantle can be broadly divided into two parts: the Upper Mantle, which extends to a depth of 700 kilometers, and the Lower Mantle, which spans the region from 700 to 2,900 kilometers.

## The Core

- The central region of the Earth is referred to as the Core.
- It is also known as the Barysphere.
- The Weichert-Gutenberg discontinuity serves as the boundary between the Earth's core and the mantle.
- The Earth's core consists of two layers. The outer core, composed of molten iron in a liquid state, extends from a depth of 2,900 to 5,150 kilometers.

- The inner core—known as NIFE—is composed of solid nickel and iron and extends from 5,150 to 6,370 kilometers. Its density is  $13.0 \text{ g/cm}^3$ .
- In terms of the Earth's total volume, the crust accounts for 1%, the mantle for 84%, and the remaining 15% constitutes the core.

## Movements of the Earth's Plates

- Continental or oceanic plates float upon the asthenosphere—a soft layer situated beneath the Earth's crust.
- Occasionally, when these plates collide with one another, they buckle and form folds. The formation of the Himalayan peaks occurred through this very process.
- The region situated between the Earth's crust and the upper layer of the mantle is known as the lithosphere.

## Earthquakes

- The specific location where an earthquake originates is known as the \*seismic focus\* (or hypocenter).
- The point situated on the Earth's crust directly above the seismic focus is called the \*epicenter\*.
- The instrument used to record seismic waves (earth tremors) is called a \*seismograph\*.
- The magnitude (energy intensity) of an earthquake is calculated using the scale devised by Richter.
- The Richter scale ranges from 0 to 9.
- Tremors with a magnitude of 2.0 or less are rarely felt.
- Ground fissures and subsidence typically occur only when seismic waves exceed a magnitude of 5.0.
- A magnitude of 6.0 or higher is considered very powerful; seismic waves exceeding 7.0 result in earthquakes capable of causing massive destruction.
- Three types of seismic waves occur:
  - P-waves (Primary waves) — Compression waves
  - S-waves (Secondary waves) — Shear waves
  - L-waves (Love waves) — Surface waves
- Large waves generated in the ocean by an earthquake are known as \*Tsunamis\* (a Japanese term).
- The Tsunami that occurred in the Indian Ocean on December 26, 2004, devastated the coastal regions of Indonesia, India, Sri Lanka, and Thailand, sweeping them away into the sea.

## Distribution of Earthquakes

- Earthquakes associated with the Pacific Ring of Fire are predominantly observed within the Pacific Ocean region.

### Landforms Created by Rivers

- Rapidly flowing river water vertically erodes and deepens a valley. This valley, characterized by a narrow bed and a 'V' shape, is known as a **'V'-shaped valley**.
- When a river reaches a plain, it twists and turns; the large curves formed as it flows with significant bends are called **'Meanders'**.
- The term "meander" (referring to a river bend) originated from the name of the **'Meander River'** located in Asia Minor (present-day Turkey).
- Due to continuous erosion and deposition occurring on both sides of a meander, the neck of the meander gradually narrows. Over time, the meander is cut off from the main river channel and evolves into a lake. This is known as an **'Oxbow Lake'**.
- The raised banks of a floodplain are referred to as **'Levees'** or natural embankments.
- When a river reaches the sea, the velocity of the water decreases, and the river splits into several distinct channels. These channels are known as **'Distributaries'**.

### Waterfalls

- The **'Angel Falls'**, located in Venezuela (South America), is the tallest waterfall in the world.
- Other major waterfalls include the **'Niagara Falls'** (situated on the border between Canada and the United States in North America) and the **'Victoria Falls'** (located on the border between Zambia and Zimbabwe in Africa).

### Glaciers

- Glaciers are broadly classified into two types: **'Valley Glaciers'** and **'Continental Glaciers'**.
- **'Continental Glaciers'** are found in Antarctica and Greenland.
- **'Valley Glaciers'** are found in mountainous regions, such as the Himalayas and the Alps.
- The landforms created on mountain slopes through glacial erosion are known as **'Cirques'**. E.g., Corrie Sgurr in Scotland, Kar Cirque in Germany.
- When the ice melts, the cirque fills with water, forming beautiful lakes in mountainous regions. These lakes are known as 'Tarn Lakes.'
- When two cirques meet, they form sharp, knife-edge ridges known as 'Arêtes.'

- "U"-shaped valleys are formed by the lateral and vertical erosion caused by glaciers.
- Large and small particles of sand and silt transported by glaciers are deposited. These deposits are called glacial 'Moraines.'

### Wind

- Because wind erodes the lower section of a rock faster than its upper section, the rock appears wide at the top and narrow at the base. These formations are known as 'Mushroom Rocks.'
- An isolated, residual hill standing like a pillar with a rounded top is termed an 'Erosional Remnant' (or Inselberg). An example of this can be found in the Kalahari Desert in the USA.
- In deserts, as the wind blows, it transports sand from one location to another and deposits it. Sand dunes that resemble a crescent moon in shape are called 'Crescent Dunes' (or Barchans).
- Since sand particles are light and low in weight, the wind can transport them over great distances. These deposits are known as 'Loess' (wind-blown silt deposits). Loess deposits are found in abundance in China.
- The loess deposits found in Northern China were transported from the Gobi Desert.

### The Sea

- When the land adjacent to a coastline rises vertically, the steep rock face overlooking the sea—shaped by the impact and erosion of waves—is known as a 'Sea Cliff.'
- As the interior cavity of sea caves expands, only the cave's roof remains standing, giving rise to sea arches. Through further erosion by sea waves, only the side walls are left standing; these formations are known as sea stacks.
- The longest beach in the world is Miami Beach in the United States.
- The second-longest beach is Marina Beach, located in Chennai.
- Shallow bodies of water that are partially or completely separated from the coastline are known as lagoons or backwaters. Examples include Chilika Lake in Odisha, Pulicat Lake in Tamil Nadu, and Vembanad Lake in Kerala.

**The three key components of tourism are: Attractions, Accessibility, and Service Facilities.**

- The concept that integrates these three components is referred to as the "3 A's" in English.
- Gastronomy refers to an aspect of cultural tourism.
- Adventure Tourism: Skydiving in Australia; Bungee jumping in New Zealand.
- Religious Tourism: Rameswaram (Tamil Nadu), Kanchipuram (Tamil Nadu), Varanasi (Uttar Pradesh), Sarnath (Uttar Pradesh), Vaishno Devi Temple (Jammu & Kashmir), St. Francis Xavier Church (Goa), Amritsar (Punjab), Buddhist Monasteries in Ladakh (Jammu & Kashmir).
- Beautiful Hill Stations in India: Kodaikanal & Ooty (Tamil Nadu), Nainital (Uttarakhand), Darjeeling (West Bengal), Srinagar (Jammu & Kashmir), Shillong (Meghalaya), Shimla (Himachal Pradesh), Munnar (Kerala), Gangtok.
- Inclusive Group Tourism for TIC (Tourism Information Centre) organizations.
- IATA – International Air Transport Association.
- IATO – Indian Association of Tour Operators.
- TAAI – Travel Agents Association of India.
- TITHA – Tamil Nadu Tourism, Travel, and Hospitality Association.
- TTDC – Tamil Nadu Tourism Development Corporation.

### Waterfalls in India

| S.No. | Water falls              | Geographical location                                                                               |
|-------|--------------------------|-----------------------------------------------------------------------------------------------------|
| 1.    | Thalaiyar waterfalls     | Horse tail type located in Dindugul district of Tamil Nadu                                          |
| 2.    | Jog water falls          | Segmented waterfall (Raja, Rani and thunder) located in Shimoga district of Karnataka.              |
| 3.    | Nohkalikai waterfalls    | Tallest plunge type of waterfall situated in the East khasi hill district of Meghalaya.             |
| 4.    | Talakona waterfalls      | It is the highest waterfall in Andhra Pradesh. A lot of medicinal herbs are seen around the region. |
| 5.    | Aathirappally waterfalls | The Niagara of India, is located in Thrissur district of Kerala.                                    |

### Wildlife Sanctuaries in India

| S.No. | Wildlife Sanctuary           | State          | Animals                      |
|-------|------------------------------|----------------|------------------------------|
| 1.    | Mudumalai wildlife sanctuary | Tamil Nadu     | Tiger, Elephant, Bison, Deer |
| 2.    | Kaziranga National Park      | Assam          | Tiger, Deer, Buffalo         |
| 3.    | Ranthambor National Park     | Rajasthan      | Tiger                        |
| 4.    | Kanha National Park          | Madhya Pradesh | Swamp Deer                   |
| 5.    | Sundarbans National Park     | West Bengal    | Bengal Tiger                 |
| 6.    | Gir National Park            | Gujarat        | Lions                        |
| 7.    | Bhadra Wildlife Sanctuary    | Karnataka      | Bison, Leopard, Gaur         |
| 8.    | Periyar National Park        | Kerala         | Elephant, Deer               |
| 9.    | Corbett National Park        | Uttarakhand    | Tiger                        |

### Beaches

| S.No. | Beaches        | State       | Geographical features                                                       |
|-------|----------------|-------------|-----------------------------------------------------------------------------|
| 1.    | Dhanushkodi    | Tamil Nadu  | Turquoise blue sea water                                                    |
| 2.    | Varkala Beach  | Kerala      | Sea Cliffs for wonderful sunset views                                       |
| 3.    | Tarkarli Beach | Maharashtra | Coral reefs and marine adventure                                            |
| 4.    | OM Beach       | Karnataka   | Two semicircular caves that join together forming the inverted symbol of OM |
| 5.    | Aguda Beach    | Goa         | A huge hill dominates the southern side of the beach.                       |
| 6.    | Marari Beach   | Kerala      | Saddle like rock(Hammock) Beach                                             |

### North America

- Since they were discovered in the latter part of the 15th century, North America and South America are referred to as the "New World."
- Christopher Columbus discovered North America in 1492. Following the arrival of the Italian explorer Amerigo Vespucci to this region, the landmass was named "America" in 1507.

### Boundaries

- The Isthmus of Panama connects North America and South America. The Bering Strait separates North America from Asia.

### Political Divisions

- North America stands as the third-largest continent. It comprises three major nations and several smaller countries.
- Canada is the largest country on the North American continent, followed by the United States and Mexico, which rank second and third, respectively.
- Isthmus: A narrow strip of land connecting two larger landmasses. Strait: A narrow body of water connecting two larger bodies of water.

### Physical Features

- Mount McKinley (Denali), standing at an elevation of 6,194 meters above sea level, is the highest peak in North America.
- The Rocky Mountains: This mountain range extends for a length of approximately 4,800 kilometers, stretching from Alaska in the north to the Isthmus of Panama in the south.
- The Rocky Mountains and the Coastal Ranges collectively form what is known as the Western Cordilleras.
- Continents and their Highest Peaks: Asia – Mount Everest (8,848 m); South America – Aconcagua (6,962 m); North America – Mount McKinley (6,194 m); Africa – Kilimanjaro (5,895 m).
- The Great Plains: The western section of the vast plains situated at the foothills of the Rocky Mountains is referred to as the "High Plains." Rivers such as the Mississippi and Missouri flow through this region.
- The Appalachian Highlands: The Appalachian upland region is characterized by its relatively low elevation and broad expanse.
- Rivers: The Mississippi and Missouri rivers are the longest rivers in North America. Together, they form the fourth-largest river system in the world.
- The Saint Lawrence River begins its journey at Lake Ontario, flows northeastward, and empties into the Atlantic Ocean.

- The Colorado River has carved out the world-famous Grand Canyon—a massive valley—within the Columbia Plateau.
- The Rio Grande River, which flows into the Gulf of Mexico, serves as the natural boundary between the United States and Mexico.
- The Grand Canyon is an extremely deep valley with steep, vertical walls, carved by the Colorado River in the U.S. state of Arizona.
- Numerous lakes are found across this continent, particularly in its frozen regions—specifically in the northern part of Minnesota. These lakes are collectively known as the Great Lakes.
- The largest among these is Lake Superior, which is the largest freshwater lake in the world.
- The Mississippi River is often referred to by the nickname "The Big Muddy." This name was bestowed upon it because, as it flows down from the mountains, it carries along significant amounts of soil and silt.

### Westerlies:

- Also known as "anti-trade winds," these are prevailing winds that blow from west to east within the mid-latitude zone, spanning approximately 30 to 60 degrees latitude.

### Wheat

- Wheat is cultivated on a massive scale across the Prairie grasslands of North America. North America stands as the world's leading exporter of wheat.

### Sugarcane

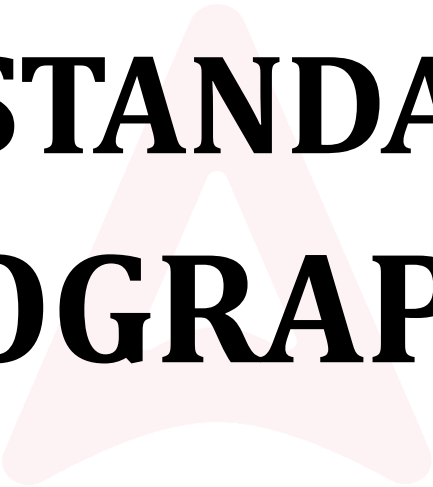
- Cuba is often referred to as the "Sugar Bowl of the World." It is the world's largest exporter of sugar.

### Fishing Industry

- The Grand Banks, located near the island of Newfoundland in Canada, is one of the world's finest fishing grounds.
- The United States of America is often referred to as a "Melting Pot," because hundreds of diverse cultures merge and blend together here to create a new, composite culture.
- The Eskimos inhabit regions characterized by extreme cold and harsh living conditions—specifically, those areas where fish are abundant. They dress in clothing made from the soft furs of animals and reside in \*igloos\*. These dome-shaped dwellings, constructed by them using blocks of ice, are known as \*igloos\*.

### South America

- When combined with Central America, South America is collectively referred to as Latin America.
- It acquired this name because it was discovered by Europeans—specifically the Spanish and the Portuguese—and subsequently governed as their colonies.



# **8<sup>th</sup> STANDARD GEOGRAPHY**

## Rocks:

- The term \*Petrology\* is derived from the Greek language. \*Petrus\* refers to rocks, and \*Logos\* refers to the study of them.
- Rocks are classified into three main categories: Igneous rocks, Sedimentary rocks, and Metamorphic rocks.
- The term \*Igneous\* is derived from the Latin language; \*Igneous\* means "fire."

## Igneous Rocks:

- Igneous rocks are formed when molten rock material (magma), emerging from the deep interior of the Earth, cools and solidifies.
- Since other types of rocks are derived from these, they are referred to as "Primary Rocks" or "Parent Rocks."
- These rocks are hard and impermeable to water. They do not contain fossils or organic remains.
- Igneous rocks are associated with volcanic activity. They are widely used in construction work.
- They are broadly classified into two types: Extrusive Igneous Rocks and Intrusive Igneous Rocks.
- The granite-type rocks found in peninsular regions are excellent examples of Extrusive Igneous Rocks.
- Granite, Diorite, and Gabbro (volcanic rock) are excellent examples of Intrusive Igneous Rocks.
- Since Intrusive Igneous Rocks contain large crystals, they are also referred to as "Crystalline Rocks."
- Mount Vesuvius, Mount Stromboli, and Mount Etna in Italy—as well as Mauna Loa and Mauna Kea in the Hawaiian Islands—are among the world's most significant active volcanoes.

## Sedimentary Rocks:

- The term \*Sedimentary\* is derived from the Latin word \*Sedimentum\*.
- These rocks are also referred to as "Stratified Rocks" (Layered Rocks).
- Sedimentary rocks are the primary source for the formation of natural resources such as coal, oil, and natural gas.
- The world's oldest sedimentary rocks were discovered in Greenland; their age is estimated to be 3.9 billion years.
- Sedimentary rocks are classified into organic, clastic (physical), and chemical sedimentary rocks.
- Organic sedimentary rocks are formed through the accumulation and deposition of decomposed organic

matter from living organisms and plants. Examples of rocks formed in this manner include chalk, chert, dolomite, and limestone.

- Clastic (physical) sedimentary rocks are formed through the weathering and breakdown of igneous and metamorphic rocks. Sandstone, conglomerate, and shale are excellent examples of this type of rock.

## Chemical Sedimentary Rocks:

- In these rocks, minerals present within the rocks dissolve in water, transforming into a chemical solution. These rocks are formed through the process of evaporation. They are also referred to as 'Evaporite Rocks.'
- Sedimentary rocks serve as a primary source for the formation of natural resources such as coal, oil, and natural gas.

## Metamorphic Rocks

- The term 'Metamorphic' is derived from two Greek words: \*Meta\* and \*Morpha\*.
- \*Meta\* signifies 'change,' while \*Morpha\* signifies 'form.' Due to intense heat and pressure, igneous and sedimentary rocks undergo transformation and come to be known as metamorphic rocks.
- Metamorphic rocks are classified into two types: Thermal Metamorphism and Dynamic Metamorphism.
- The Taj Mahal in India—one of the Wonders of the World—is constructed using white marble, a metamorphic rock.
- Through dynamic metamorphism, granite rock transforms into Gneiss.
- Through thermal metamorphism, basalt rock transforms into Slate.
- Through thermal metamorphism, sandstone transforms into Quartzite; similarly, claystone transforms into Slate.

## The Rock Cycle

- Igneous rocks are the primary rocks that originated on Earth.
- As these rocks undergo weathering, erosion, transportation, and deposition, they evolve into sedimentary rocks.
- Both igneous and sedimentary rocks undergo transformation into metamorphic rocks due to the influence of heat and pressure.
- When metamorphic rocks undergo weathering, transportation, and deposition, they give rise to sedimentary rocks.

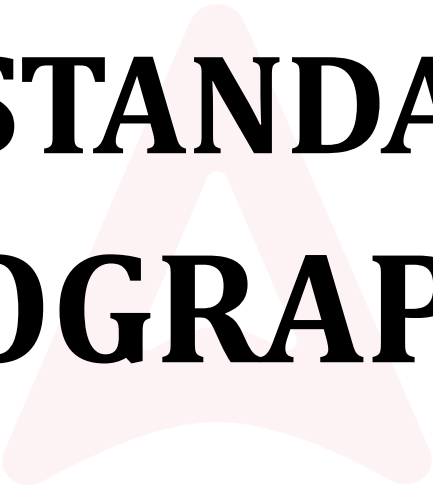
## The African Continent

- Africa is referred to as the 'Mother Continent' because it is the oldest continent on Earth inhabited by human beings.
- Africa is also known as the 'Dark Continent.' The European explorer Henry M. Stanley was the first to use the term "Dark Continent."
- The group of Northwest African nations—comprising Morocco, Algeria, Libya, Mauritania, and Tunisia—is known as the 'Maghreb.' In Arabic, this term signifies "the West."
- The world-renowned Sahara Desert is situated in the northern part of Africa. It is the largest hot desert in the world, covering an area of 9.2 million square kilometers. The Nile and Niger rivers flow through the Sahara Desert.
- The Atlas Mountains are located in the northwestern region of Africa. They are a young fold mountain range that separates the Mediterranean Sea and the Atlantic Ocean from the Sahara Desert. Its highest peak is Mount Toubkal.
- The Sahel—meaning "border" or "edge"—is a transitional zone situated between the Sahara Desert to the north and the Savannah grasslands to the south.
- Savannah—Tropical dry grasslands characterized by scattered trees are known as Savannahs. These grasslands cover more than half of Africa's total landmass.
- The Serengeti Plain is one of the largest plains located within the Savannah region. These plains are often referred to as an "open-air zoo."
- Lake Victoria—Africa's largest freshwater lake—ranks as the second-largest lake in the world, surpassed only by Lake Superior in the United States. It serves as the source of the Nile River. Located within this same rift valley, Lake Tanganyika is the deepest and longest freshwater lake in the world.
- Kilimanjaro—Located in Africa, Kilimanjaro (5,895 meters) is the highest peak situated in this highland region.
- The Swahili Coast is situated along the entire length of the East African coastline.
- The Kalahari Desert is located in the southern part of South Africa, while the Namib Desert is situated along the southwestern coastal region of Africa.

- The Nile River—spanning a length of 6,650 kilometers—is the longest river in the world. It comprises two major tributaries: the White Nile, which originates in Burundi, and the Blue Nile, which originates in Ethiopia. The Nile River is referred to as the "Father of African Rivers."
- Since the Nile River serves as the very lifeline of Egypt, it is known as the "Gift of Egypt."
- The Congo—The Congo River is the second-largest river in Africa, following the Nile.
- The Niger River—It originates in the highlands of Guinea in West Africa.
- Zambezi - The Zambezi River is the fourth-longest river in Africa. The world-renowned Victoria Falls, standing at a height of 108 meters, was created by this river. It is referred to as the "Lifeline of Southern Africa."
- Baobab, Beaverwood, and Sausage trees are among the major tree species found in Africa.
- The dry, hot, dust-laden local wind that blows from the Sahara Desert towards the Guinea Coast is known as the "Harmattan."
- The hot local wind that blows from the Sahara Desert towards the Mediterranean Sea is known as the "Sirocco."
- Tropical rainforests are referred to as the "Jewels of the Earth" and the "World's Great Pharmacy."
- Cotton is a major cash crop in Africa.
- Kimberley, located in South Africa, is a major diamond-producing center in Africa.
- The Abor, Batwa, Bushmen, Dinka, Maasai, Pygmies, Zulu, Tswana, and Efe are among the major indigenous tribes of Africa.

## The Continent of Australia

- The capital of Australia is Canberra.
- Ayers Rock (or Uluru Rock)—the world's largest single rock monolith—is situated in the central part of this arid region.
- Limestone pillars known as "Pinnacles" are found in abundance in this region.
- The Australian Alps is Australia's highest mountain range. The highest peak in this range is Mount Kosciuszko, standing at 2,230 meters.
- The Great Artesian Basin, located in Queensland, Australia, is the world's largest and deepest basin.



# **9<sup>th</sup> STANDARD GEOGRAPHY**

# Unit-1

## Lithosphere – Earth's Internal Processes

### Structure of the Earth

#### Earth's Crust

- It extends to a depth of 5 to 30 kilometers.
- The Earth's crust can be broadly classified into two types: the Continental Crust and the Oceanic Crust.
- Since silica and aluminum are found in abundance within the Earth's crust, this layer is referred to as 'SiAl'.

#### Mantle

- The region situated beneath the Earth's crust is known as the Mantle. Its thickness is approximately 2,900 kilometers.
- Due to the high concentration of silica and magnesium, it is referred to as 'SiMa'.
- In the upper portion of the mantle, rocks exist in a solid state, whereas in the lower portion, they are found in a molten state.
- The molten rock material found within the Earth's interior is known as Magma.

#### Core

- The layer situated beneath the Earth's mantle, at the very center of the Earth, is called the Core.
- It is extremely hot. Since nickel and iron are found in abundance within this layer, it is referred to as 'NiFe'.
- The Core consists of two distinct layers: the Inner Core, which is in a solid state, and the Outer Core, which is in a liquid state.
- The high concentration of iron within the Core is primarily responsible for the Earth's gravitational force.
- As the Earth rotates on its axis, the liquid Outer Core rotates around the solid Inner Core; this rotational motion generates the Earth's magnetic field.

### Types of Rocks

#### Igneous Rocks

- The Latin word \*Ignis\* translates to "fire."
- Magma cools down and solidifies as its heat dissipates, thereby forming rock. These solidified rocks are known as Igneous Rocks.
- The Deccan Plateau was formed through the solidification of igneous rocks. Granite and basaltic igneous rocks are referred to as primary rocks or parent rocks.

#### Sedimentary Rocks

- The Latin word \*sediment\* means "to settle" or "to deposit." When rocks disintegrate into particles, these sediments are transported by agents such as rivers, glaciers, and wind, and are subsequently deposited in layers.
- Examples of such rocks include sandstone, limestone, chalk, gypsum, coal, and conglomerates.

#### Metamorphic Rocks

- The term \*metamorphic\* is derived from the word \*metamorphosis\*. It signifies "transformation" or "change of form."
- Granite transforms into Gneiss, Basalt into Schist, Limestone into Marble, and Sandstone into Quartzite.
- Examples of Igneous rocks: Granite, Basalt.
- Examples of Sedimentary rocks: Gypsum, Limestone.
- Examples of Metamorphic rocks: Diamond, Marble.

#### Tectonic Plates

- The Lithosphere is divided into several tectonic plates. These are classified as major plates and minor plates.
- The horizontal, lateral movement of tectonic plates relative to one another is known as lateral movement.
- Mountains formed as a result of folding within rock strata are called Fold Mountains.
- The movement of tectonic plates exerts pressure on rocks, leading to the formation of fissures. These fissures are referred to as rifts. The Rift Valley in East Africa is an excellent example of this phenomenon.
- Approximately 140 million years ago, the Indian Plate broke away from the supercontinent known as Gondwana, drifted northward, and eventually collided with Asia.
- The collision between the Indian Plate and the Eurasian Plate along the India-Nepal border resulted in the formation of a mountain-building zone. This event also led to the creation of the Tibetan Plateau—the highest plateau in the world.

#### Earthquake

- The specific point within the Earth's interior where seismic tremors originate is known as the focus (or hypocenter) of the earthquake.
- These waves generate secondary waves (elastic waves) around themselves.
- The point located directly above the hypocenter—on the Earth's surface—is known as the Epicenter.
- The impact of an earthquake is felt most intensely at the epicenter on the Earth's surface.

## Seismic Waves

### Primary Waves (Primary or 'P' waves)

- These travel much faster than other waves. Capable of traveling through solid, liquid, and gaseous media, their average speed varies from 5.6 km to 10.6 km per second.

### Secondary Waves (Secondary or 'S' waves)

- These are capable of traveling only through solid materials. These transverse waves induce ground motion perpendicular to their direction of travel. Their average speed ranges from 1 km to 8 km per second.

### Surface Waves (Surface waves or 'L' waves)

- These resemble primary waves. They travel over long distances along the Earth's surface. They are slower than other waves but are capable of causing the greatest destruction. Their average speed ranges from 1 km to 5 km per second.
- The instrument used to record earthquakes is called a Seismograph or Seismometer. The scientific study of earthquakes is known as Seismology.
- C.F. Richter developed the earthquake magnitude scale. The earthquake that occurred in 1960 at Bio-Bio, Chile—registering a magnitude of 9.5 on the Richter scale—is considered the highest magnitude ever recorded.

### Tsunami

- "Tsunami" is a Japanese word. It translates to "Harbor Waves."
- A massive tsunami was triggered by an earthquake that occurred in the ocean in 2004. This colossal wave traveled at a speed of 600 kilometers per hour.
- The tsunami—generated by an earthquake that struck near Indonesia at approximately 00:58 AM—took seven hours to reach the shores of Chennai.
- Approximately 280,000 people lost their lives in this disaster. The cause of this event was the subduction of the Indo-Australian Plate beneath the Eurasian Plate. It was recorded as a magnitude 9 on the Richter scale.

## Volcanoes

- The word "Volcano" is derived from the Latin word "Vulcan," which is the name of the Roman god of fire.
- Volcanoes are classified into three types based on their level of activity.

### Active Volcanoes

- These are volcanoes that continuously and permanently emit lava, ash particles, and gases. Mount St. Helens in the United States is an example of an active volcano.

### Dormant Volcanoes

- Volcanoes that have shown no signs of volcanic activity for a long period are known as dormant volcanoes. These have the potential to erupt suddenly. Mount Fuji in Japan is an example of a dormant volcano.

### Extinct Volcanoes

- These are volcanoes that show absolutely no signs of volcanic activity. Mount Kilimanjaro in Tanzania (Africa) is an example of an extinct volcano.
- Volcanoes are further classified into three types based on their shape and the composition of their materials.
- Composite Volcano (Stratovolcano) — These are also known as stratovolcanoes. They consist of alternating layers of ash, solidified lava, and pumice deposits. They typically appear in a conical shape. Mount Fuji in Japan is an example.
- Lava Dome — In this type, highly viscous (thick) lava rich in silica erupts and, unable to flow over long distances, accumulates in a circular mound-like formation resembling a small hill. The Parícutin volcano in Mexico is an example.
- Shield Volcano — In this type, highly fluid lava flows outward in all directions, forming a broad, gently sloping structure that resembles a shield. Mauna Loa on the island of Hawaii is an example.
- Since volcanic eruptions occur frequently along the boundaries where the Pacific Plate meets other continental plates within the Pacific Ocean region, this area is known as the "Pacific Ring of Fire." Factoid
- Until 2011, the Kola Superdeep Borehole in Murmansk, Russia, was the deepest point in the world.
- However, in 2012, the Sakhalin-I well in Russia attained the status of being the deepest point.



## Atmospheric Composition

- Nitrogen (78%) and Oxygen (21%) are the permanent gases of the atmosphere.
- The remaining one percent consists of Argon (0.93%), Carbon Dioxide (0.03%), Neon, Helium, Ozone, and Hydrogen.
- Daniel Rutherford discovered the presence of nitrogen gas in the atmosphere in 1772 AD, while Joseph Priestley discovered the presence of oxygen in the atmosphere in 1774 AD.

## Atmospheric Layers

### Troposphere

- The Greek word 'Tropos' means "change." This constitutes the lowest layer of the atmosphere.
- This layer extends to a height of 8 km at the poles and up to 18 km at the equator.
- Temperature decreases as one ascends higher within this layer.
- It is within this layer that all weather phenomena occur. Therefore, the lowest layer of the atmosphere is also referred to as the "weather-forming layer."
- The upper boundary of this layer is known as the 'Tropopause'.

### Stratosphere

- Located above the lowest layer is the Stratosphere. This layer extends up to an altitude of 50 km within the atmosphere.
- Since it contains a high concentration of ozone molecules, it is also referred to as the 'Ozonosphere'.
- In this layer, temperature increases as altitude rises.
- This layer is conducive for the flight of jet aircraft.
- The upper boundary of this layer is known as the 'Stratopause'.

### Mesosphere

- The Mesosphere is found within the atmosphere at altitudes ranging from 50 km to 80 km.
- Radio waves transmitted from the Earth are reflected back to the Earth from this layer.
- Meteoroids approaching the Earth are incinerated upon entering this layer.
- The upper boundary of the Mesosphere is known as the 'Mesopause'.

### Thermosphere

- The layer situated above the Mesosphere is the Thermosphere. It extends up to an altitude of approximately 600 km.
- Since the composition of gases in the lower section of the Thermosphere is uniform, this region is referred to as the 'Homosphere'. Conversely, as the composition of gases in the upper section of the Thermosphere is non-uniform, that region is referred to as the 'Heterosphere'.

- The Ionosphere is situated within the Thermosphere region. This area is characterized by the presence of ions and electrons.

### Exosphere

- The uppermost layer of the atmosphere is known as the exosphere.
- Gases are extremely sparse in this region. The upper boundary of this layer gradually merges with outer space. Unique luminous phenomena known as 'Aurora Australis' occur within this layer.
- Caused by electrons from magnetic storms originating on the Sun's surface, a spectacle resembling a multicolored light display—much like fireworks—appears in the midnight skies over the polar regions. This phenomenon is known as the 'Aurora.'

### Altitude Above Sea Level

- The elevation of a specific location is calculated based on sea level. For every 165 meters of ascent, the temperature decreases by 1°C. This phenomenon is referred to as 'Temperature Inversion.' Consequently, temperatures tend to be lower in high-altitude regions.
- Based on the amount of heat received from the Sun, the Earth is broadly divided into three distinct zones.

### Torrid Zone (Tropical Zone)

- The Torrid Zone constitutes 50 percent of the Earth's surface area. It extends from 23½° North Latitude to 23½° South Latitude. It is within this zone that the Sun's rays strike the Earth's surface vertically (at a right angle).

### Temperate Zone

- In the Northern Hemisphere, the Temperate Zone extends from 23½° North Latitude to 66½° North Latitude. In this region, the Sun's rays strike the Earth at an oblique angle.

### Frigid Zones (Polar Zones)

- In the Northern Hemisphere, the Frigid Zone extends from 66½° North Latitude up to 90° North Latitude. Since the Sun's rays strike this region at an extremely oblique angle, it stands as one of the coldest zones on Earth. These zones remain permanently frozen.

### Atmospheric Pressure

- Atmospheric pressure is measured using a mercury barometer. The unit used to measure this is called the 'millibar'.
- Vertical Distribution of Atmospheric Pressure
- As one ascends in altitude, air pressure decreases. For every 300 meters of elevation gain, air pressure drops by 34 millibars.

### Equatorial Low-Pressure Zone

- The region situated between 5° North and South latitudes from the Equator constitutes the Equatorial Low-Pressure Zone. This zone is referred to as the 'Zone of Calm'.
- The ITCZ (Intertropical Convergence Zone) is the region where air masses converging from the Subtropical High-Pressure Zones meet and rise upward from the tropical equatorial region. The 'Doldrums'—an equatorial zone characterized by calm conditions, unpredictable winds, and sudden storms—is also known as the 'Zone of Calm'.

### Subtropical High-Pressure Zone

- This zone extends from the tropical region up to 35° North and South latitudes. This zone is also referred to as the 'Horse Latitudes'.

### Subpolar Low-Pressure Zone

- This zone spans from 45° North latitude up to the Arctic Circle (66½° N), and from 45° South latitude up to the Antarctic Circle (66½° S).
- Polar **High-Pressure Zone**
- Temperatures in this region are extremely low because the Sun's rays strike the surface at a highly oblique angle.

### Wind

- An anemometer is used to measure wind speed, while a wind vane is used to determine wind direction.

### Types of Winds

- Winds are broadly classified into four major categories:
  1. Planetary Winds
  2. Periodic Winds
  3. Variable Winds
  4. Local Winds

### Planetary Winds

- Winds that blow steadily in the same direction throughout the year are known as Planetary Winds. These are also referred to as 'Prevailing Winds'.

### Trade Winds

- Winds that blow from the subtropical high-pressure belts in the Northern and Southern Hemispheres towards the equatorial low-pressure belt are called 'Trade Winds'.
- These winds are named 'Trade Winds' because they were historically helpful to merchants for their sea voyages.

### Westerlies

- The Westerlies are steady winds. They are characterized by their high velocity. Consequently, these winds are referred to as the 'Roaring Forties' at 40° latitude, the 'Furious Fifties' at 50° latitude, and the 'Screaming Sixties' at 60° latitude.

### Polar Easterlies

- Cold, dry winds that blow from the polar high-pressure belts towards the sub-polar low-pressure belts are known as Polar Easterlies.

### Periodic Winds

- These winds possess the characteristic of changing their direction according to the season. Therefore, they are also known as 'Monsoon Winds'.
- Due to the Earth's rotation, winds deviate from their intended path of flow. This deviation of winds from their original trajectory is termed the "Coriolis Effect."
- Winds deflect to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. This is known as "Ferrel's Law." William Ferrel was the one who proposed Ferrel's Law.

### Cyclones

#### Tropical Cyclones

- Tropical cyclones are referred to by various names.
- They are known as "Cyclones" in the Indian Ocean, "Typhoons" in the Western Pacific Ocean, "Hurricanes" in the Eastern Pacific and Atlantic Ocean regions, "Baguio" in the Philippines, and "Willy-willy" in Australia.
- Super Cyclone: On Friday, October 29, 1999, a massive cyclone struck the coastal regions of the state of Odisha in India.

#### Temperate Cyclones

- Temperate cyclones form in the latitudinal belts between 35° and 65° North and South, specifically in areas where warm and cold air masses converge. The winds reaching India from these regions are referred to as "Western Disturbances."

#### Extra-Tropical Cyclones

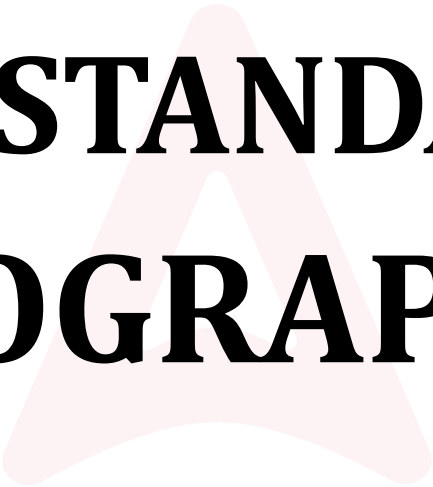
- These occur in the latitudinal belts ranging from 30° to 60° North and South. They are also known as "Mid-latitude Cyclones."
- In the year 2000 AD, a meeting was held involving India, Bangladesh, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand to address the naming of cyclones that originate in the Indian Ocean. Subsequently, in 2004, each of these nations submitted a list of names for cyclones.

#### Cyclones that Struck Tamil Nadu and the Affected Areas

|      |                                 |
|------|---------------------------------|
| 2010 | Jill - Chennai                  |
| 2011 | Thane - Qatar                   |
| 2012 | Colombo - Sri Lanka and Chennai |
| 2013 | Mars - Chennai                  |
| 2016 | Renu - Nagapattinam and Chennai |
| 2016 | Sunith - Chennai                |
| 2016 | Nada - Chennai                  |
| 2016 | Vardah - Chennai                |
| 2017 | Ockhi - Kanyakumari             |

#### Local Winds

- A wind that blows in a specific location for only a short duration is known as a local wind. It is referred to by a distinct name in every region of the world. These include:
  - Föhn - (Alps - Europe)



# **10<sup>th</sup> STANDARD GEOGRAPHY**

# Unit-1

## India – Location, Physiography, and Drainage

### India – Location, Physiography, and Drainage

- India is the seventh-largest country in the world in terms of area and the second-largest country on the Asian continent.
- India's land area covers 3,287,263 square kilometers.
- This constitutes 2.4 percent of the Earth's total surface area.
- It possesses a long coastline, approximately 6,100 km in length, extending along three of its sides.
- The total length of India's coastline, including its island groups, is 7,516.6 km.
- The Palk Strait is the narrow, shallow stretch of sea that separates India from Sri Lanka.
- India is referred to as a subcontinent.
- India is designated as a subcontinent because it exhibits the same diversity found within a full continent—encompassing variations in physical features, climate, natural vegetation, minerals, and human resources.

### Location and Extent

- India extends from 8° 4' North Latitude to 37° 6' North Latitude, and from 68° 7' East Longitude to 97° 25' East Longitude.
- Based on its latitudinal and longitudinal extent, the entirety of India is situated within the Northern and Eastern Hemispheres.

### Indian Standard Time (IST)

- India spans approximately 30 degrees of longitude.
- As the Earth rotates on its axis, it traverses 360 degrees of longitude in 24 hours.
- The time required to traverse one degree of longitude is 4 minutes.
- The local time at India's central meridian—82° 30' East Longitude—is adopted as the Indian Standard Time (IST).
- This meridian passes through Mirzapur (near Allahabad). • Indian Standard Time is 5 hours and 30 minutes ahead of Greenwich Mean Time.
- Indira Point—formerly known as Pygmalion Point—is situated at 6° 45' North Latitude within the Andaman and Nicobar Islands archipelago.
- The southernmost tip of the Indian mainland is Cape Comorin (Kanyakumari). The northernmost point is known as Indira Col; it is located in Jammu and Kashmir.
- India extends for a length of 3,214 km from Indira Col in Kashmir in the north to Kanyakumari in the south,

and for a length of 2,933 km from the Rann of Kutch in Gujarat in the west to Arunachal Pradesh in the east.

- For administrative convenience, India is divided into 29 states and 7 Union Territories.
- The capital of Andhra Pradesh is Amaravati.

### India's physical features can be broadly classified into six major divisions:

1. The Himalayas
1. The Great Northern Plains of India
2. The Peninsular Plateaus
3. The Indian Desert
4. The Coastal Plains
5. Islands

### The Himalayas

- The Himalayas (Northern Mountains) are the youngest and highest mountain ranges in the world.
- They extend over a length of approximately 2,500 km, stretching from the Indus Valley in the west to the Brahmaputra Valley in the east.
- The famous Pamir Knot is known as the "Roof of the World."
- It serves as the connecting link between the high mountain ranges of Central Asia and the Himalayas.
- The word 'Himalaya' is derived from Sanskrit and means "Abode of Snow."

### The Himalayas can be broadly divided into three major subdivisions:

1. The Trans-Himalayas (or Western Himalayas).
2. The Himalayas (or Central Himalayas).
3. The Eastern Himalayas (or Purvachal Hills).

### The Trans-Himalayas

- These mountains are also known as the Western Himalayas.
- Since a significant portion of their extent lies within Tibet, they are also referred to as the 'Tibetan Himalayas.'
- The rock formations found in this region consist of Tertiary granite rocks containing fossils of marine organisms.
- The major mountain ranges located here are the Zaskar, Ladakh, Kailash, and Karakoram ranges.

### The Himalayas

- The Himalayas were formed as a result of the immense pressure generated when the Angara landmass in the north and the Gondwana landmass in the south moved towards each other; this pressure caused the intervening Tethys Sea to fold and uplift.

### **These can be divided into three sections:**

1. The Greater Himalayas (or Himadri).
2. The Lesser Himalayas (or Himachal).
3. The Siwaliks (or Outer Himalayas).

#### **The Greater Himalayas (or Himadri)**

- The average elevation is 6,000 meters.
- Most of the highest peaks in the entire Himalayan range are situated within this mountain chain.
- Notable peaks include Mount Everest (8,848 m) and Kanchenjunga (8,586 m).
- Mount Everest is located in Nepal, while Kanchenjunga is situated along the border between Nepal and Sikkim.
- As these mountains remain perpetually covered in snow, glaciers such as Gangotri and Siachen are found here.

#### **The Lesser Himalayas or Himachal**

- The prominent mountain ranges found within this Himalayan series include the Pir Panjal, Dhauladhar, and Mahabharat ranges.
- Famous summer resorts such as Shimla, Mussoorie, Nainital, Almora, Ranikhet, and Darjeeling are situated within this mountain range.
- The Khyber Pass, which connects Pakistan and Afghanistan, and the Bolan Pass in Pakistan are key passes within the Indian subcontinent.

#### **The Siwaliks or Outer Himalayas**

- This mountain range extends from Jammu and Kashmir all the way to Assam.
- It consists of highly discontinuous mountain ranges.
- These ranges are referred to as 'Duars' in the eastern region and 'Duns' in the western region.
- These areas are well-suited for the development of human settlements.

#### **Significance of the Himalayas**

- They intercept the Southwest Monsoon winds, thereby bringing heavy rainfall to the North Indian region.
- They serve as the source of perennial rivers; e.g., the Indus, Ganges, and Brahmaputra rivers.

#### **The Great Northern Plains**

##### **1. The Bhabar Plain**

- This plain is composed of large pebbles and various other sediments deposited by the Himalayan rivers.

##### **2. The Terai Region**

- The Terai region is an area characterized by high humidity.

##### **3. The Bhangar Plain**

- 'Bhangar' refers to a landform consisting of elevated alluvial deposits.
- The sediments found here are composed entirely of old alluvial soil.

#### **4. The Khadar Plain**

- The fresh alluvial soil transported and deposited by rivers is known as 'Khadar' or 'Bet' land.

#### **5. The Delta Plain**

- Within the alluvial plains, the elevated land areas are referred to as 'Chars,' while the marshy areas are known as 'Bils.' India's Great Northern Plains can be classified into four categories based on their climatic and topographical characteristics:
  1. The Rajasthan Plains
  2. The Punjab-Haryana Plains
  3. The Ganges Plains
  4. The Brahmaputra Plains

#### **The Peninsular Plateaus**

- This plateau is bounded by the Aravalli Range to the northwest; the Bundelkhand Highlands, Kaimur Range, and Rajmahal Hills to the north and northeast; the Western Ghats to the west; and the Eastern Ghats to the east.
- It has an average elevation of 600 meters above sea level.
- Anaimudi Peak (2695 m), located in the Anaimalai Hills, is the highest peak of this plateau.
- The Narmada River divides the Peninsular Plateau into two major parts.
- Its northern part is known as the Central Highlands, while its southern part is called the Deccan Plateau.
- Rivers flowing to the south of the Vindhya Range—such as the Godavari, Kaveri, Mahanadi, and Krishna—flow eastward and drain into the Bay of Bengal.
- Due to the rift valleys situated to the south of the Vindhya Range, the Narmada and Tapi rivers flow westward and drain into the Arabian Sea.

#### **The Central Highlands**

- The Aravalli Range extends for approximately 700 km in a northwestward direction, stretching from Gujarat through Rajasthan up to Delhi.
- The highest peak of the Aravalli Range is Guru Shikhar (1722 m).
- The western part of the Central Highlands is known as the Malwa Plateau. Rivers such as the Chambal, Betwa, and Ken flow through this plateau and join the Yamuna River.
- The eastern extension of the Malwa Plateau... This region is known as Bundelkhand, and its extension is called Baghelkhand.
- Chota Nagpur Plateau: Located in the northeastern part of the Central Highlands.

#### **Deccan Plateau**

- It is roughly triangular in shape.
- It is bounded by the Vindhya and Satpura ranges in the northwest; the Mahadev hills, Maikala hills, and Rajmahal hills in the north and northeast; the Western Ghats in the west; and the Eastern Ghats in the east.

# Unit-6

## Tamil Nadu – Natural Divisions

In accordance with the States Reorganisation Act of 1956, states were reorganized on a linguistic basis.

### Formation of the State

- Following independence, when states were demarcated along linguistic lines, the Telugu-speaking regions were separated from the Madras Presidency.
- After this bifurcation, the Madras Presidency retained only 13 districts.
- On January 14, 1969, the Madras Presidency was officially renamed "Tamil Nadu" by the then Chief Minister, C.N. Annadurai.

### Location and Area

- Tamil Nadu is one of the 29 states of India.
- Its geographical extent spans from 8° 4' North Latitude to 13° 35' North Latitude, and from 76° 18' East Longitude to 80° 20' East Longitude.
- Point Calimere (Kodiakkarai) marks the easternmost extremity of Tamil Nadu, while the Anaimalai Hills constitute its westernmost extremity.
- Pulicat Lake serves as the northernmost point, and Cape Comorin (Kanyakumari) marks the southernmost point.
- The total geographical area of Tamil Nadu is 130,058 square kilometers.
- It is the eleventh-largest state in India.
- Tamil Nadu accounts for approximately 4 percent of India's total land area.

### Boundaries and Neighboring States

- Regarding its boundaries, the Gulf of Mannar and the Palk Strait separate Tamil Nadu from Sri Lanka.
- Following Gujarat, Tamil Nadu possesses the third-longest coastline in India, stretching over a length of 1,076 kilometers.

### Administrative Divisions

- Currently, Tamil Nadu comprises 35 districts, including the newly created districts of Kallakurichi, Tenkasi, and Chengalpattu.

| S.No. | Administrative/Political Unit | Count     |
|-------|-------------------------------|-----------|
| 1     | Districts                     | 35 (32+3) |
| 2     | Revenue Divisions             | 76        |
| 3     | Taluks                        | 226       |
| 4     | Blocks                        | 1,127     |
| 5     | Revenue Villages              | 16,564    |
| 6     | Municipal Corporations        | 15        |
| 7     | Municipalities                | 125       |
| 8     | Panchayat Unions              | 385       |
| 9     | Town Panchayats               | 561       |

|    |                                     |        |
|----|-------------------------------------|--------|
| 10 | Village Panchayats                  | 12,618 |
| 11 | Lok Sabha Constituencies            | 39     |
| 12 | Legislative Assembly Constituencies | 234    |

### Physical Features

- Tamil Nadu is situated on the Deccan Plateau, also known as the Peninsular Plateau.
- This region originated from the Gondwana landmass, which broke away approximately 135 million years ago during the Cretaceous period.
- The topography of Tamil Nadu features a general eastward slope.
- Based on its topography, Tamil Nadu is broadly classified into five major divisions: the Western Ghats, the Eastern Ghats, Plateaus, Coastal Plains, and Inland Plains.

### The Western Ghats

- The Western Ghats extend from the Nilgiris in the north to Maruthamalai (located in Swamithope, Kanyakumari District) in the south.
- The elevation of this mountain range varies between 2,000 meters and 3,000 meters.
- It covers a total area of 2,500 square kilometers.
- The Palakkad Gap, Sengottai Gap, Aralvoimozhi Gap, and Achankovil Gap are the major passes within this range.
- The Nilgiris, Anaimalai, Palani Hills, Cardamom Hills, Varusanad, Andipatti, and Agasthiyar Hills are the prominent hill ranges located within the Western Ghats.

### The Nilgiri Hills

- This hill range features 24 peaks that rise to an elevation of over 2,000 meters.
- The highest peak in this range is Doddabetta (2,637 meters).
- Mukuruthi (2,554 meters) is another prominent peak in this range.
- Ooty and Coonoor are the major hill stations situated in this region.

### The Anaimalai Hills

- The Anaimalai Hills are situated along the border between Tamil Nadu and Kerala, located to the south of the Palakkad Gap.
- The Anaimalai Tiger Reserve, Aliyar Reserved Forests, the Valparai hill station, and the Kadambarai Hydroelectric Power Station are all located within this hill region.

- The Aliyar and Thirumoorthy dams have been constructed at the foothills of this mountain range.

#### **Palani Hills**

- The Palani Hills constitute the eastern part of the Western Ghats.
- The highest peak in the Palani Hills is Vandaravu (2,533 m).
- The hill station of Kodaikanal (2,150 m) is situated in the south-central part of the Palani Hills.

#### **Cardamom Hills**

- These mountains are also known as the Elamalai Hills.
- They acquired this name due to the extensive cultivation of cardamom in this region.
- Pepper and coffee are the primary crops cultivated in this mountainous area.

#### **Peaks in the Western Ghats**

##### **Height (in meters)**

1. Doddabetta - 2,637
2. Mukurthi - 2,554
3. Vembadi Shola - 2,505
4. Perumal Malai - 2,234
5. Kottai Malai - 2,019
6. Bagasura - 1,918

#### **Varusanadu and Andipatti Hills**

- Meghamalai, Kazhugumalai, Kurangani Hills, and the Suruli and Kumbakarai waterfalls are found within these mountain ranges.
- The Srivilliputhur Grizzled Squirrel Wildlife Sanctuary is located on the southern slopes of these hills in the Virudhunagar district.
- The Vaigai River and its tributaries originate in this region.

#### **\*Pothigai Hills**

- The major portion of this mountain range lies within the Tirunelveli district, while its southern slopes are situated in the Kanyakumari district.
- It is known by various names, including Sivajothi Parvath, Agasthiyar Hills, and Southern Kailash.
- The Kalakkad Mundanthurai Tiger Reserve is located in this region.

#### **Mahendragiri Hills**

- The test facility for satellite propulsion systems belonging to the Indian Space Research Organisation (ISRO) is situated at the foothills of this mountain range.

#### **Eastern Ghats**

- Unlike the Western Ghats, the Eastern Ghats consist of a discontinuous chain of hills.
- The Javadi, Shevaroy, Kalvarayan, Kolli, and Pachaimalai hills are the major hill ranges of the Eastern Ghats located in Tamil Nadu.

#### **Javadi Hills**

- An extension of the Eastern Ghats, these hills span across the Tiruvannamalai and Vellore districts; the

range effectively serves as a natural boundary separating these two districts.

- The highest peak in this range is Melpattu.
- The Kavalur Observatory, established in 1967, is located here.
- Many parts of the Javadi Hills are composed of bluish-grey granite rocks.

#### **Kalvarayan Hills**

- The name 'Kalvarayan' is derived from the word 'Karalar,' the ancient name of the indigenous tribal community currently inhabiting the region.
- Together with the Javadi and Shevaroy hills, this range acts as a watershed divide, separating the river basins of the Cauvery and Palar rivers.

#### **Shevaroy Hills**

- The Shevaroy hill range is situated in close proximity to the city of Salem.
- The name of this mountain range is derived from 'Shevaroyan,' the name of the local deity worshipped in the region.
- 'Solaikkaradu,' a peak located within this range with an elevation of 1,620 meters, stands as the highest peak in the southern section of the Eastern Ghats.
- The Yercaud hill station, known as the "Ooty of the Poor," is situated in this mountain range.
- The Servarayan Temple located here marks the highest point in this region (1623 m).

| S. No | Peaks in the Eastern Ghats | Height (in meters) |
|-------|----------------------------|--------------------|
| 1.    | Servarayan Hills           | 1,623              |
| 2     | Pazhamalai                 | 1,500              |
| 3.    | Urugamalai                 | 1,486              |
| 4.    | Kuttirayan                 | 1,395              |
| 5.    | Muganur                    | 1,279              |
| 6.    | Valasamalai                | 1,034              |

#### **Kolli Hills**

- Kolli Hills is a small mountain range located in the Namakkal district.
- The Arapaleeswarar Temple is a significant pilgrimage site situated within this mountain range.

#### **Pachaimalai**

- This appears as a low-lying hill range spanning across the districts of Tiruchirappalli, Perambalur, and Salem.

#### **Plateaus**

- The plateau region in Tamil Nadu is situated between the Western Ghats and the Eastern Ghats.
- It is roughly triangular in shape and covers an area of approximately 60,000 square kilometers.
- The Baramahal Plateau, located in the northwestern part of Tamil Nadu, forms a part of the Mysore Plateau.
- The districts of Dharmapuri and Krishnagiri are situated within this plateau region.
- The Coimbatore Plateau is situated between the Nilgiris and Dharmapuri districts. The Moyar River separates this plateau from the Mysore Plateau.

1. Which of the following sectors are \_\_\_\_\_ severely affected by Global Warming?

- (i) Agriculture and Environment
- (ii) Agriculture and Industrial sector
- (iii) Agriculture, Horticulture, and Environment
- (iv) Industrial sector
- (a) (i) and (ii)                      (b) (i) and (iii)
- (c) (iii) only                      (d) (i) and (iv)
- (e) Answer not known

2. Choose the correct statement(s) regarding Monsoon:

- (i) Most of the monsoon rainfall is caused by low-pressure depressions in the Arabian Sea and the Bay of Bengal.
- (ii) The amount of rainfall increases as the distance from the coast increases.
- (iii) During the Southwest Monsoon, the eastern coastal region of Tamil Nadu remains dry.
- (a) (i) is correct
- (b) (i) and (iii) are correct
- (c) (ii) and (iii) are correct
- (d) (i) and (ii) are correct
- (e) Answer not known

3. Choose the incorrect pair regarding forest types in India and their species:

- (1) Evergreen Forest — Rosewood, Toon, Ebony, Gurjan
- (2) Monsoon Forest — Silver Fir, Walnut, Deodar, White Willow
- (3) Equatorial Forests — Chir, Blue Pine, Spruce, Cypress
- (a) (1) only                      (b) (1) and (3) only
- (c) (2) only                      (d) (2) and (3) only
- (e) Answer not known

4. Which of the following are caused by earthquakes?

- (i) Lightning                      (ii) Landslides
- (iii) Thunder                      (iv) Tsunami
- (v) Flood
- (a) (ii), (iv) and (v)                      (b) (i), (ii) and (iii)
- (c) (ii) only                      (d) (ii) and (v)
- (e) Answer not known

5. Biochemical Oxygen Demand (BOD) is the amount of oxygen consumed during the use of \_\_\_\_\_ in water.

- (a) Microorganisms                      (b) Plants
- (c) Animals                      (d) Algae
- (e) Answer not known

6. Among the following tribes, who act as pastoralists (cattle herders)?

- (a) Dimar                      (b) Kevats
- (c) Rawats                      (d) Bhils
- (e) Answer not known

7. Assertion [A]: The development of a country depends on its infrastructure.

Reason [R]: Transport and Communication are the backbone of economic development.

- (a) Both [A] and [R] are correct; [R] is the correct explanation of [A].
- (b) [A] is correct but [R] is incorrect.
- (c) Both [A] and [R] are correct but [R] is not the correct explanation of [A].
- (d) Both [A] and [R] are incorrect.
- (e) Answer not known

8. Assertion [A]: Climate, landform, soil, and natural resources control the distribution of population.

Reason [R]: Birth and Death rates do not affect the distribution of population.

- (a) [A] is correct but [R] is incorrect.
- (b) [A] is incorrect but [R] is correct.
- (c) Both [A] and [R] are correct and [R] is the correct explanation of [A].
- (d) Both [A] and [R] are correct but [R] is not the correct explanation of [A].
- (e) Answer not known

9. Choose the correct statement(s) regarding Soil:

- (1) The soil of the North Indian plains is mostly deposited by Himalayan rivers.
- (2) The soil popularly known as Black Soil is rich in Iron Oxide.
- (3) Soil originated from the Deccan Plateau is fertile and has a high moisture-retention capacity.
- (a) (1) only is correct                      (b) (1) and (3) are correct
- (c) (2) and (3) are correct                      (d) (1) and (2) are correct
- (e) Answer not known

10. Select the correct statement(s) about the Malwa Plateau:

- (1) It slopes towards the East with an average height of 600 meters.
- (2) The Chambal and its tributaries flow through most parts of the plateau.
- (3) The Malwa Plateau is located in Rajasthan, Gujarat, and Madhya Pradesh.
- (a) (1) only is correct
- (b) (1) and (3) are correct
- (c) (2) and (3) are correct
- (d) (1) and (2) are correct
- (e) Answer not known

**11. Which of the following statements are correct regarding Carbon Monoxide emissions?**

- (1) It is caused by incomplete combustion of fuel.  
 (2) It comes from petrol-fueled vehicles.  
 (3) Long-term emission causes nausea.  
 (a) (1) and (2) only      (b) (2) and (3) only  
 (c) (1), (2) and (3)      (d) (1) and (3)  
 (e) Answer not known

**12. Match the following Shifting Cultivation types with their Regions:**

| Shifting Cultivation | Region      |
|----------------------|-------------|
| (a) Ladang           | 1. Malaysia |
| (b) Milpa            | 2. Vietnam  |
| (c) Roca             | 3. Brazil   |
| (d) Ray              | 4. Mexico   |

|     | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (a) | 1   | 4   | 3   | 2   |
| (b) | 3   | 4   | 1   | 2   |
| (c) | 4   | 2   | 3   | 1   |
| (d) | 2   | 3   | 4   | 1   |

(e) Answer not Known

**13. Assertion [A]: Migration is the movement of people between regions and territories.**

**Reason [R]: Migration can be internal or international.**

- (a) Assertion [A] is correct but Reason [R] is incorrect.  
 (b) Assertion [A] is incorrect and Reason [R] is correct.

- (c) Both Assertion [A] and Reason [R] are correct.  
 (d) Both Assertion [A] and Reason [R] are incorrect.  
 (e) Answer not known

**14. Which of the following is incorrectly matched?**

- (1) Trans-Siberian Railway – Connects the Baltic Sea and the Pacific Ocean.  
 (2) Trans-Caspian Railway – Connects Central Asia and Japan.  
 (3) Canadian Pacific Railway – Connects the Atlantic Ocean and the Indian Ocean.  
 (4) Trans-Continental Railway – Connects Buenos Aires and Valparaíso.  
 (a) (1) only      (b) (2) only  
 (c) (3) only      (d) (4) only  
 (e) Answer not known

**15. Match the following Lakes with their States:**

| Lakes                 | States            |
|-----------------------|-------------------|
| (a) Kolleru Lake      | 1. Rajasthan      |
| (b) Loktak Lake       | 2. Kerala         |
| (c) Sambhar Lake      | 3. Manipur        |
| (d) Sasthamkotta Lake | 4. Andhra Pradesh |

|     | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (a) | 4   | 1   | 3   | 2   |
| (b) | 3   | 4   | 2   | 1   |
| (c) | 4   | 3   | 1   | 2   |
| (d) | 2   | 4   | 3   | 1   |

(e) Answer not known

**ANSWER KEY**

|     |     |     |     |     |     |     |     |     |     |    |     |    |     |    |     |    |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|----|-----|----|-----|----|-----|-----|-----|
| 1.  | (c) | 2.  | (b) | 3.  | (c) | 4.  | (a) | 5.  | (a) | 6. | (c) | 7. | (a) | 8. | (a) | 9. | (b) | 10. | (c) |
| 11. | (c) | 12. | (a) | 13. | (c) | 14. | (c) | 15. | (c) |    |     |    |     |    |     |    |     |     |     |

**TNPSC PREVIOUS YEAR QUESTIONS**

**1. Arrange the following mountain ranges from North to South and select the correct answer using the code given below.**

1. Karakoram Range      2. Ladakh Range  
 3. Pir Panjal Range      4. Zaskar Range  
 (a) 1, 2, 3 and 4      (b) 2, 1, 4 and 3  
 (c) 2, 1, 3 and 4      (d) 1, 2, 4 and 3  
 (e) Answer not known

**2. Match the following:**

**List I – Mountain Pass | List II – State**

| List I          | List II              |
|-----------------|----------------------|
| (a) Bom La      | 1. Sikkim            |
| (b) Khardung La | 2. Jammu & Kashmir   |
| (c) Nathu La    | 3. Himachal Pradesh  |
| (d) Shipki La   | 4. Arunachal Pradesh |

|     | (a)        | (b)        |
|-----|------------|------------|
| (a) | 2, 4, 3, 1 | 2, 3, 1, 4 |
| (c) | 4, 2, 3, 1 | 2, 1, 4, 3 |

(e) Answer not known

**3. Where is the Sivalik Hill located?**

- (a) Outer Himalayas      (b) Greater Himalayas  
 (c) Sub-Himalayas      (d) Central Himalayas  
 (e) Answer not known

**4. Assertion (A): The height of the Eastern Himalayas increases rapidly, unlike the Western Himalayas.**

**Reason (R): The world's highest peaks, Everest and Kanchenjunga, are located near the plains of Bihar and West Bengal.**

- (a) Both (A) and (R) are correct, and (R) is the correct explanation of (A)  
 (b) Both (A) and (R) are correct, but (R) is not the correct explanation of (A)  
 (c) (A) is correct, but (R) is incorrect  
 (d) (A) is incorrect, but (R) is correct  
 (e) Answer not known

**48. Match the following river systems with their rivers:**

- |                              |               |
|------------------------------|---------------|
| (a) Indus River System       | 1. Panchganga |
| (b) Brahmaputra River System | 2. Jhelum     |
| (c) Godavari River System    | 3. Bhima      |
| (d) Krishna River System     | 4. Sankosh    |

- |                      |                |
|----------------------|----------------|
| (a) 3, 2, 1, 4       | (b) 2, 4, 1, 3 |
| (c) 2, 1, 4, 3       | (d) 2, 1, 3, 4 |
| (e) Answer not known |                |

**49. The two main streams of the Ganga, Alaknanda and Bhagirathi, unite together at**

- |                      |                 |
|----------------------|-----------------|
| (a) Devprayag        | (b) Karnaprayag |
| (c) Vishnuprayag     | (d) Rudraprayag |
| (e) Answer not known |                 |

**50. Match the following Hydro-power stations with their states:**

- |              |  |                |
|--------------|--|----------------|
| (a) Balimela |  | 1. Maharashtra |
| (b) Girna    |  | 2. Odisha      |
| (c) Akrimota |  | 3. Assam       |
| (d) Kopili   |  | 4. Gujarat     |

- |                      |                |
|----------------------|----------------|
| (a) 2, 1, 4, 3       | (b) 1, 2, 3, 4 |
| (c) 4, 3, 2, 1       | (d) 4, 1, 2, 3 |
| (e) Answer not known |                |

**51. Method used to determine the polymer used for a water treatment plant**

- |                      |               |
|----------------------|---------------|
| (a) JAR test         | (b) RBC       |
| (c) Trickling filter | (d) Bio tower |
| (e) Answer not known |               |

**52. In major floods, there is high concentration of \_\_\_\_\_.**

- |                      |            |
|----------------------|------------|
| (a) Rocks            | (b) Stones |
| (c) Sediments        | (d) Fish   |
| (e) Answer not known |            |

**53. Which of the following is the right-bank tributary of the Godavari River?**

- |                      |               |
|----------------------|---------------|
| (a) Purna            | (b) Manjira   |
| (c) Penganga         | (d) Indravati |
| (e) Answer not known |               |

**54. \_\_\_\_\_ river streams disappear at Hanumangarh (in Bikaner).**

- |                      |             |
|----------------------|-------------|
| (a) Vipasa           | (b) Chambal |
| (c) Hakra            | (d) Kosi    |
| (e) Answer not known |             |

**55. \_\_\_\_\_ rivers are known as perennial rivers.**

- |                         |                         |
|-------------------------|-------------------------|
| (a) Peninsular rivers   | (b) West flowing rivers |
| (c) East flowing rivers | (d) Himalayan rivers    |
| (e) Answer not known    |                         |

**56. Which river is known as Tsangpo in Tibet?**

- |                      |               |
|----------------------|---------------|
| (a) Damodar          | (b) Manas     |
| (c) Brahmaputra      | (d) Mahananda |
| (e) Answer not known |               |

**57. Consider the following statement. Parson valley is associated with?**

- |                         |                 |
|-------------------------|-----------------|
| (1) Hydroelectric power | (2) Solar power |
| (3) Nuclear power       | (4) Wind power  |

**Which of the above is correct?**

- |                      |         |
|----------------------|---------|
| (a) (2), (3)         | (b) (1) |
| (c) (1), (4)         | (d) (4) |
| (e) Answer not known |         |

**58. Largest producer of green energy**

- |                      |                      |
|----------------------|----------------------|
| (a) Solar energy     | (b) Hydroelectricity |
| (c) Wind power       | (d) Geothermal power |
| (e) Answer not known |                      |

**59. Which of the following is a west-flowing river in India?**

- |                      |              |
|----------------------|--------------|
| (a) Mahanadi         | (b) Krishna  |
| (c) Narmada          | (d) Godavari |
| (e) Answer not known |              |

**60. The largest west-flowing river of Peninsular India is**

- |                      |               |
|----------------------|---------------|
| (a) Mahi             | (b) Sabarmati |
| (c) Narmada          | (d) Luni      |
| (e) Answer not known |               |

#### ANSWER KEY

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.  | (d) | 2.  | (c) | 3.  | (a) | 4.  | (a) | 5.  | (c) | 6.  | (d) | 7.  | (a) | 8.  | (c) | 9.  | (d) | 10. | (b) |
| 11. | (b) | 12. | (a) | 13. | (c) | 14. | (c) | 15. | (d) | 16. | (c) | 17. | (b) | 18. | (b) | 19. | (a) | 20. | (b) |
| 21. | (a) | 22. | (d) | 23. | (b) | 24. | (a) | 25. | (b) | 26. | (a) | 27. | (b) | 28. | (a) | 29. | (b) | 30. | (b) |
| 31. | (a) | 32. | (c) | 33. | (a) | 34. | (c) | 35. | (d) | 36. | (a) | 37. | (c) | 38. | (c) | 39. | (b) | 40. | (b) |
| 41. | (b) | 42. | (a) | 43. | (b) | 44. | (b) | 45. | (b) | 46. | (a) | 47. | (a) | 48. | (b) | 49. | (a) | 50. | (a) |
| 51. | (a) | 52. | (c) | 53. | (b) | 54. | (c) | 55. | (d) | 56. | (c) | 57. | (b) | 58. | (b) | 59. | (c) | 60. | (c) |

