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# 60 DAY RAPID REVISION (RARE) SERIES Prelims 2025

## UPSC/IAS Prelims 2025

## RaRe Notes Compilations

### Geography Part 1


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## SYLLABUS

### 1. Geomorphology

- Earth's Interior - Types of Earthquake (Seismic) Waves
- Earth's Layers: Crust, Mantle & Core
- Fundamentals of Geomagnetism.
- Earth Movements: Endogenetic Earth Movements
- Earth Movements: Exogenetic Earth Movements | Weathering
- Continental Drift Theory - Evidence in Support of Continental Drift
- Geosynclines.
- Tectonics: Sea Floor Spreading & Paleomagnetism
- Isostasy.
- Theory of Plate Tectonics - Indian Plate Movement
- Ocean – Ocean Convergence - Island Arc Formation
- Continent – Ocean Convergence - Formation of Fold Mountains
- Continent – Continent Convergence - Formation of Himalayas
- Types of Mountains - Classification of Mountains
- Fold Mountains & Block Mountains (most important types of mountains)
- Important mountain ranges
- Volcanism
- Volcanic Landforms: Extrusive & Intrusive
- Volcanism Types Based on Out Flow of Lava: Exhalative, Effusive, Explosive and Subaqueous
- Hotspot Volcanism: Hawaiian Hotspot & Reunion Hotspot
- Earthquakes: Causes and Types of Earthquake Waves
- Tsunami: Propagation of Tsunami Waves
- Rock Types: Igneous, Sedimentary & Metamorphic Rocks
- Fluvial Erosional Landforms
- Glacial Landforms: Erosional and Depositional
- Marine Landforms and Cycle of Erosion
- Arid Landforms: Wind Eroded & Water Eroded
- Karst Landforms & Cycle of Erosion
- Important Lakes on Earth & Facts About Lakes
- Plateau Formation & Types of Plateaus | Major Plateaus of The World

### 2. Location and physiography of India

- Geological development
- Political geography including India's neighbours, border and frontiers etc.
- Physiographic regions
- Cratons
- Regions
    - The Himalayas
    - The Peninsular Plateau
    - Indo-Gangetic plain
    - Thar Desert
    - Coastal plains and ghats

**Q.1) Consider the following statements:**

Statement-I: Mercury, Venus, Earth and Mars are called as the terrestrial planets.
Statement-II: They have thick atmosphere, mostly of helium and hydrogen.

**Which one of the following is correct in respect of the above statements?**

a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I
b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I
c) Statement-I is correct, but Statement-II is incorrect
d) Statement-I is incorrect, but Statement-II is correct

**Q.1) Solution (c)**

**Explanation:**

- Our Solar system consists of eight planets. Out of the eight planets, mercury, venus, earth and mars are called as the inner planets as they lie between the sun and the belt of asteroids the other four planets are called the outer planets. They are also called Terrestrial, meaning earth-like as they are made up of rock and metals, and have relatively high densities. **Hence, statement 1 is correct.**
- The rest four planets (Jupiter, Saturn, Neptune and Uranus) are called Jovian or Gas Giant planets. Jovian means Jupiter-like. Most of them are much larger than the terrestrial planets and have thick atmosphere, mostly of helium and hydrogen. All the planets were formed in the same period sometime about 4.6 billion years ago. **Hence, statement 2 is not correct.**

**Q.2) Consider the following statements:**

1. The position of the earth when it is farthest from the sun is called perihelion.
2. The earth is farthest from the sun on 3$^{rd}$ January.
3. The annual insolation received by the earth on 4$^{th}$ July is more than the amount received on 3$^{rd}$ January.

**How many of the above statements is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.2) Solution (d)**

**Explanation:**

- The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the earth and the sun. During its revolution around the sun, when the earth is farthest from the sun, it is called aphelion. **Hence, statement 1 is not correct.**
- The earth is farthest from the sun (152 million km) on 4th July. On 3rd January, the earth is the nearest to the sun (147 million km). This position is called perihelion. **Hence, statement 2 is not correct.**
- The annual insolation received by the earth on 3rd January is slightly more than the amount received on 4th July. However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation. Hence, this variation in the solar output does not have great effect on daily weather changes on the surface of the earth. **Hence, statement 3 is not correct.**

**Q.3) Consider the following statements:**

1. The total radiation energy received from the Sun per unit of time per unit of area is called solar constant.
2. The insolation received at the earth's surface varies from tropics to the poles.
3. Equator receives more insolation than the tropics.

**How many of the above statements is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.3) Solution (b)**

**Explanation:**

- Solar constant is the total radiation energy received from the Sun per unit of time per unit of area. It is most accurately measured from satellites where atmospheric effects are absent. The value of the constant is approximately 1.366 kilowatts per square metre. **Hence, statement 1 is correct.**
- The insolation received at the surface varies from about 320 Watt/m2 in the tropics to about 70 Watt/m2 in the poles. Maximum insolation is received over the subtropical deserts, where the cloudiness is the least. **Hence, statement 2 is not correct.**
- Equator receives comparatively less insolation than the tropics. Generally, at the same latitude the insolation is more over the continent than over the oceans. In winter, the

middle and higher latitudes receive less radiation than in summer. **Hence, statement 3 is not correct.**

**Q.4) Consider the following statements:**

1. The early atmosphere largely contained water vapour, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen.
2. The present composition of earth's atmosphere is chiefly contributed by oxygen and carbon dioxide.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.4) Solution (a)**

**Explanation:**

- The early atmosphere largely contained water vapour, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen. The process through which the gases were outpoured from the interior is called degassing. Continuous volcanic eruptions contributed water vapour and gases to the atmosphere. As the earth cooled, the water vapour released started getting condensed. **Hence, statement 1 is correct.**
- The present composition of earth's atmosphere is chiefly contributed by nitrogen and oxygen. It is composed of nitrogen (78%), oxygen (21%), argon (0.9%), carbon dioxide (0.04%) and various trace gases. A variable amount of water vapour is also present in the atmosphere (approx. 1% at sea level) and it decreases with altitude. **Hence, statement 2 is not correct.**

**Table 8.1 : Permanent Gases of the Atmosphere**

| *Constituent* | *Formula* | *Percentage by Volume* |
|---|---|---|
| Nitrogen | $N_2$ | 78.08 |
| Oxygen | $O_2$ | 20.95 |
| Argon | Ar | 0.93 |
| Carbon dioxide | $CO_2$ | 0.036 |
| Neon | Ne | 0.002 |
| Helium | He | 0.0005 |
| Krypto | Kr | 0.001 |
| Xenon | Xe | 0.00009 |
| Hydrogen | $H_2$ | 0.00005 |

**Q.5) Consider the following epochs:**

1. Pleistocene
2. Holocene
3. Eocene
4. Miocene

**Arrange the given epochs in chronological order using the code given below:**

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

**Q.5) Solution (d)**

**Explanation:**

- The Paleogene period is divided into--from oldest to youngest--the Paleocene, Eocene, and Oligocene epochs. The Neogene is divided into the Miocene and Pliocene epochs. Finally, the Quaternary is divided into the Pleistocene and Holocene epochs. **Hence, option d is the correct answer.**

**Geological Time Scale**

| *Eons* | *Era* | *Period* | *Epoch* | *Age/ Years Before Present* | *Life/ Major Events* |
|---|---|---|---|---|---|
| | Cainozoic (From 65 million years to the present times) | Quaternary | Holocene | 0 - 10,000 | Modern Man |
| | | | Pleistocene | 10,000 - 2 million | Homo Sapiens |
| | | Tertiary | Pliocene | 2 - 5 million | Early Human Ancestor |
| | | | Miocene | 5 - 24 million | Ape: Flowering Plants and Trees |
| | | | Oligocene | 24 - 37 million | Anthropoid Ape |
| | | | Eocene | 37 - 58 Million | Rabbits and Hare |
| | | | Palaeocene | 57 - 65 Million | Small Mammals : Rats – Mice |
| | Mesozoic 65 - 245 Million Mammals | Cretaceous | | 65 - 144 Million | Extinction of Dinosaurs |
| | | Jurassic | | 144 - 208 Million | Age of Dinosaurs |
| | | Triassic | | 208 - 245 Million | Frogs and turtles |
| | Palaeozoic 245 - 570 Million | Permian | | 245 - 286 Million | Reptile dominate-replace amphibians |
| | | Carboniferous | | 286 - 360 Million | First Reptiles: Vertebrates: Coal beds |
| | | Devonian | | 360 - 408 Million | Amphibians |
| | | Silurian | | 408 - 438 Million | First trace of life on land: Plants |
| | | Ordovician | | 438 - 505 Million | First Fish |
| | | Cambrian | | 505 - 570 Million | No terrestrial Life : Marine Invertebrate |
| Proterozoic | Pre-Cambrian 570 Million - 4,800 Million | | | 570 - 2,500 Million | Soft-bodied arthropods |
| Archean | | | | 2,500 - 3,800 Million | Blue green Algae: Unicellular bacteria |
| Hadean | | | | 3,800 - 4,800 Million | Oceans and Continents form – Ocean and Atmosphere are rich in Carbon dioxide |
| Origin of Stars | 5,000 - 13,700 Million | | | 5,000 Million | Origin of the sun |
| Supernova | | | | 12,000 Million | Origin of the universe |
| Big Bang | | | | 13,700 Million | |

**Q.6) Consider the following:**

1. Gravitation
2. Magnetic field
3. Seismic activity
4. Rocks from mining areas

**Which of the above are indirect sources to know about the interior of the earth?**

a) 1 and 2 only
b) 1, 2 and 3 only
c) 2, 3 and 4 only
d) 1, 2, 3 and 4

**Q.6) Solution (b)**

**Explanation:**

- Analysis of properties of matter indirectly provides information about the interior. Some of the indirect sources to know about the interior of the earth include gravitation, magnetic field, and seismic activity. Surface rocks or the rocks we get from mining areas are examples of direct sources. **Hence, option b is the correct answer.**

**Q.7) Consider the following statements:**

1. All natural earthquakes take place in the lithosphere.
2. Lithosphere refers to the portion of depth up to 200 km from the surface of the earth.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.7) Solution (c)**

**Explanation:**

- An earthquake in simple words is shaking of the earth. It is a natural event. It is caused due to release of energy, which generates waves that travel in all directions. All natural earthquakes take place in the lithosphere. **Hence, statement 1 is correct.**
- Lithosphere refers to the portion of depth up to 200 km from the surface of the earth. It includes the brittle upper portion of the mantle and the crust, the outermost layers of Earth's structure. It is bounded by the atmosphere above and the asthenosphere (another part of the upper mantle) below. **Hence, statement 2 is correct.**

**Q.8) With reference to earthquakes, consider the following statements about P-waves:**

1. The P-waves are the first to arrive at the surface.
2. These are similar to sound waves.
3. These can travel only through solid materials.

**Which of the above statements is/are correct?**

a) 1 only
b) 1 and 2 only
c) 1 and 3 only

d) 1, 2 and 3

**Q.8) Solution (b)**

**Explanation:**

- Earthquake waves are basically of two types- body waves and surface waves. There are two types of body waves. They are called P and S-waves. P-waves move faster and are the first to arrive at the surface and are also called 'primary waves.' The surface waves are the last to report on seismograph and are more destructive. **Hence, statement 1 is correct.**
- The P-waves are similar to sound waves. They leave behind a trail of compressions and rarefactions on the medium they move through. P waves are also called pressure waves for this reason. Certain animals, such as dogs, can feel the P waves much before an earthquake hits the crust. **Hence, statement 2 is correct.**
- They travel through gaseous, liquid and solid materials. On the other hand, S-waves can travel only through solid materials. This characteristic of the S-waves is quite important and it has helped scientists to understand the structure of the interior of the earth. **Hence, statement 3 is not correct.**

**Q.9) Consider the following statements:**

1. The scale used to measure magnitude of the earthquake is known as the Richter scale.
2. The Richter scale ranges from 1 to 12.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.9) Solution (a)**

**Explanation:**

- The earthquake events are scaled either according to the magnitude or intensity of the shock. The magnitude scale is known as the Richter scale, while the intensity scale is named after Mercalli, an Italian seismologist. The intensity scale takes into account the visible damage caused by the event. **Hence, statement 1 is correct.**
- The Richter scale range measures earthquakes from a magnitude of 1 (smallest) to a magnitude of 10 (largest). It is a base-10 logarithmic scale, meaning that each order of magnitude is 10 times more intensive than the last one. The range of Mercalli scale or intensity scale is from 1-12. **Hence, statement 2 is not correct.**

**Q.10) Consider the following statements about 'crust' of the Earth:**

1. Crust is the outermost solid part of the earth.
2. Continental crust is thinner as compared to the oceanic crust.
3. The upper portion of the crust is called asthenosphere.

**Which of the above statements are correct?**

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

**Q.10) Solution (a)**

**Explanation:**

- Earth has three layers: the crust, the mantle, and the core. It is the outermost solid part of the earth. It is brittle in nature and is made of solid rocks and minerals. Beneath the crust is the mantle, which is also mostly solid rocks and minerals, but punctuated by malleable areas of semi-solid magma. At the centre of Earth is a hot, dense metal core. **Hence, statement 1 is correct.**
- The thickness of the crust varies under the oceanic and continental areas. Oceanic crust is thinner as compared to the continental crust. The mean thickness of oceanic crust is 5 km whereas that of the continental is around 30 km. The continental crust is thicker in the areas of major mountain systems. It is as much as 70 km thick in the Himalayan region. **Hence, statement 2 is correct.**
- The portion of the interior beyond the crust is called the mantle. The mantle extends from Moho's discontinuity to a depth of 2,900 km. The upper portion of the mantle is called asthenosphere. **Hence, statement 3 is not correct.**

**Q.11) Consider the following description:**

They appear on the surface only after the denudational processes remove the overlying materials. They cover large areas, and at times, assume depth that may be several km. These are granitic bodies and the cooled portion of magma chambers.

**Which of the following describes the above most appropriately?**

a) Lacoliths
b) Batholiths
c) Lapoliths
d) Phacoliths

**Q.11) Solution (b)**

**Explanation:**

- Batholith is a large body of magmatic material that cools in the deeper depth of the crust develops in the form of large domes. They appear on the surface only after the denudational processes remove the overlying materials. They cover large areas, and at times, assume depth that may be several km. These are granitic bodies. Batholiths are the cooled portion of magma chambers. **Hence, option b is the correct answer.**

**Q.12) Consider the following statements:**

1. These are the most explosive volcanoes on the earth's surface.
2. The Hawaiian volcanoes are the most famous examples of shield volcanoes.
3. The shield volcanoes are mostly made up of basalt, and thus are not very steep.

**Which of the above statements are correct?**

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

**Q.12) Solution (b)**

**Explanation:**

- Caldera are the most explosive of the earth's volcanoes. They are usually so explosive that when they erupt, they tend to collapse on themselves rather than building any tall structure. The Apolaki Caldera is a volcanic caldera with a diameter of 150 kilometres (93 mi), making it the world's largest caldera. **Hence, statement 1 is not correct.**
- Barring the basalt flows, the shield volcanoes are the largest of all the volcanoes on the earth. The Hawaiian volcanoes are the most famous examples of shield volcanoes. Mauna Loa, the largest volcano on Earth in terms of volume and area covered, is a shield volcano located in Hawaii. **Hence, statement 2 is correct.**
- The shield volcanoes are mostly made up of basalt, a type of lava that is very fluid when erupted. For this reason, these volcanoes are not steep. They become explosive if somehow water gets into the vent; otherwise, they are characterised by low-explosivity. **Hence, statement 3 is correct.**

**Q.13) Consider the following elements:**

1. Iron
2. Magnesium
3. Silicon
4. Oxygen

**Arrange the above elements present in the earth's crust in descending order:**

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

**Q.13) Solution (d):**

**Explanation:**

- About 98% of the total crust of the earth is composed of eight elements like oxygen, silicon, aluminium, iron, calcium, sodium, potassium and magnesium in the descending order and the rest is constituted by titanium, hydrogen, phosphorous, manganese, sulphur, carbon, nickel and other elements. **Hence, option d is the correct answer.**

**Table 5.1 : The Major Elements of the Earth's Crust**

| *Sl. No.* | *Elements* | *By Weight(%)* |
|---|---|---|
| 1. | Oxygen | 46.60 |
| 2. | Silicon | 27.72 |
| 3. | Aluminium | 8.13 |
| 4. | Iron | 5.00 |
| 5. | Calcium | 3.63 |
| 6. | Sodium | 2.83 |
| 7. | Potassium | 2.59 |
| 8. | Magnesium | 2.09 |
| 9. | Others | 1.41 |

**Q.14) With reference to Quartz, consider the following statements:**

1. It is one of the most important components of sand and granite.
2. It is a soft mineral soluble in hot water.
3. It is white or colourless.

**Which of the above statements are correct?**

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

**Q.14) Solution (c)**

**Explanation:**

- Quartz is one of the most important components of sand and granite. It consists of silica. It is the second most abundant mineral in Earth's crust after feldspar. It occurs in nearly all acid igneous, metamorphic, and sedimentary rocks. **Hence, statement 1 is correct.**
- It is a hard mineral virtually insoluble in water. It is highly resistant to weathering and tends to concentrate in sandstones and other detrital rocks. It is an essential mineral in such silica-rich felsic rocks as granites, granodiorites, and rhyolites. **Hence, statement 2 is not correct.**
- It is white or colourless and used in radio and radar. It is one of the most important components of granite. China, Japan, and Russia are the world's primary producers of quartz. **Hence, statement 3 is correct.**

**Q.15) Consider the following statements about Metamorphic rocks:**

1. Metamorphic rocks form under the action of pressure, volume and temperature (PVT) changes.
2. Sandstone, limestone and shale are the examples of metamorphic rocks.

**Which of the above statements is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.15) Solution (a)**

**Explanation:**

- The word metamorphic means 'change of form'. These rocks form under the action of pressure, volume and temperature (PVT) changes. Metamorphism occurs when rocks are forced down to lower levels by tectonic processes or when molten magma rising through the crust comes in contact with the crustal rocks or the underlying rocks are subjected to great amounts of pressure by overlying rocks. **Hence, statement 1 is correct.**
- Sandstone, conglomerate, limestone, shale, loess etc. are examples of sedimentary rocks. Gneissoid, granite, syenite, slate, schist, marble, quartzite etc. are some examples of metamorphic rocks. **Hence, statement 2 is not correct.**

**Q.16) Consider the following statements about the Interior of the Earth:**

1. The core is the dense layer of the earth, composed mainly of iron and nickel.
2. The outermost solid part of the earth is denser than the mantle.
3. The E-prime layer is the outermost layer of the core formed due to the penetration of surface water deep into the planet.

**Which of the statement/s given above is/are correct?**

a) 1 and 2 only
b) 2 and 3 only
c) 1 and 3 only
d) 1, 2 and 3

**Q.16) Solution (c)**

**Explanation:**

- The innermost layer surrounding the earth's centre is called the core, which is about 3500 km in radius.
- Core is the most dense layer of the earth with its density range from 9.5 to 14.5 and sometimes even higher. It is composed mainly of iron and nickel thus commonly known as Nife. **Hence statement 1 is correct.**
- The core consists of two sub-layers. The inner one is solid and the outer one is semi-liquid.
- The mantle contains more iron and magnesium compared to the crust.
- The mantle is denser than the crust because the temperature and pressure inside the Earth increase with depth. **Hence statement 2 is incorrect.**
- Earth comprises four primary layers such as an inner core at the planet's centre, surrounded by the outer core, mantle, and crust.

- The formation of a new enigmatic layer called the E prime layer at the outermost part of Earth's core is a result of surface water penetrating deep into the planet, altering the composition of the metallic liquid core's outermost region. **Hence statement 3 is correct.**

**Q.17) With reference to the layers of the earth, consider the following statements:**

1. Several layers of varying thickness are a notable feature in sedimentary rocks.
2. Lacustrine sedimentary rocks are formed by wind in desert areas.

**Which of the above statement/s is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.17) Solution (a)**

**Explanation:**

- Sedimentary rocks formed as a result of the deposition of the insoluble mechanically transported material in the form of bedded deposits, sheets, and layers of various sizes.
- Sedimentary rocks are generally layered rocks because of the deposition of similar or dissimilar in colour, grain size, or mineral composition, sediments one over another in a basin. These deposits through compaction turn into rocks. This process is called lithification.
- In many sedimentary rocks, the layers of deposits retain their characteristics even after lithification. Hence, a number of layers of varying thickness are witnessed in the sedimentary rocks. **Hence statement 1 is correct.**
- The individual rock particles are first broken from rocks and then transported by running water, ocean currents, glaciers, or even by wind from one place to another.
- The process by which rock-forming material is laid down is called sedimentation or deposition. It may settle in calmer waters of lakes or oceans or at places where the transporting agent has no longer enough energy to carry them farther. These are identified as riverine, lacustrine (formed by the lake), glacial, or aeolian (formed by wind) sedimentary rocks regarding their deposition near rivers, lakes, glaciers, or deserts respectively. Therefore, Lacustrine sedimentary rocks are not formed by wind in desert areas. **Hence statement 2 is incorrect.**

**Q.18) Consider the following:**

1. Mercury
2. Venus
3. Earth
4. Mars

**How many of the above-mentioned are considered terrestrial planets?**

a) Only one
b) Only two
c) Only three
d) All four

**Q.18) Solution (d)**

**Explanation:**

Terrestrial planets are planets that are made up of mostly rock and metal and have a solid, rocky surface. They are also known as inner planets or rocky planets. The four terrestrial planets in our solar system are Mercury, Venus, Earth, and Mars. These planets are also the four innermost planets in the solar system. **Hence option d is correct.**

**Q.19) Consider the following statements:**

1. They are like light waves and travel at right angles to the direction of the wave propagation.
2. An increase in the density of the rocks increases the velocity of the wave**.**

**The above statements are referring to which of the following seismic waves?**

a) Primary waves
b) Surface waves
c) Mechanical waves
d) Secondary waves

**Q.19) Solution (d)**

**Explanation:**

There are two types of seismic waves: Body waves and Surface waves.
There are two types of Body Waves. They are called P and S-waves.

P-waves move faster and are the first to arrive at the surface. These are also called primary waves. The P waves are similar to sound waves. They travel through gaseous, liquid, and solid materials.
Secondary waves arrive at the surface with some time lag. These are called secondary waves. They can travel only through solid materials. Secondary (S) waves are known as transverse waves. These waves travel at right angles to the direction of the wave propagation. These waves seem to be like light waves. Secondary (S) waves travel only through the solid state of matter. An increase in the density of rocks increases the velocity of the waves and vice versa. The velocity of S waves varies from 3.25 km per second at or near the surface to 7.0 km per second in the interior. **Hence option d is correct**

**Q.20) Which of the following statements are considered as main assumptions of the steady-state theory?**

1. The universe has existed forever and will exist forever.
2. Matter is continuously created to fill in space created by the expansion.
3. The universe appears basically the same at all places and at all times.

**How many of the statement/s is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.20) Solution (d)**

**Explanation:**

Hoyle's concept of a steady state considered the universe to be roughly the same at any point in time. However, with greater evidence becoming available about the expanding universe, the scientific community at present favours the argument of expanding the universe.
Steady-state theory in cosmology was developed in 1948 as an alternative to the Big Bang theory. The main assumptions of the steady-state theory:

- The universe has existed forever and will exist forever.
- Matter is continuously created to fill in space created by the expansion.
- The universe appears basically the same at all places and at all times.
- The universe is in a state of dynamic equilibrium.
- The expansion of the universe is smooth and constant.

**Hence option d is correct.**

**Q.21) With reference to northern fertile plains, consider the following statements.**

1. The Tarai belt is known for the cultivation of Sugarcane and fodder.
2. Bhangar plains lie above the flood limits of the river.
3. The general slope of Punjab Haryana plains is from North East to South West

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) None

**Q.21) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| Tarai lies South of Bhabar. This is a zone of excessive dampness, thick forests, rich wildlife, and a malarial climate. In most of the northern states, from Haryana to Bihar, the Tarai forests have been cleared and plains are used for agriculture now. The Tarai belt is known for the cultivation of Sugarcane, rice, wheat, maize, oil seeds, pulses, and fodder. | Bhangar is the upland alluvial tracts formed by the old alluvium. They lie above the flood limits of the river and hence are not renewed yearly. The soil is dark in colour, rich in humus, and very productive. | The general slope of Punjab Haryana plains is from North East to South West. It is drained by the Tributaries of Indus – Satluj, Beas and Ravi. Because of the presence of so many rivers, it is full with Khadar soil which is highly productive and well irrigated. It is separated from the Ganga plains by Delhi Ridge. |

**Q.22) Which of the following statements is correct about the Khadar Plain?**

1. Khadar plains are ecologically sensitive areas.
2. Deltaic Plains of India is an extension of Khadar Plains.
3. This plain is formed by the river system of the Indus.

**Select the correct answer using the code given below:**

a) 1 and 2 only
b) 2 only
c) 2 and 3 only
d) 1, 2 and 3

**Q.22) Solution (d)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| Khadar plains are ecologically sensitive areas and support rich wildlife. This is highly fertile and most of this land is also reclaimed for agriculture. | Deltaic Plains of India is an extension of Khadar Plains. It consists mainly of old mud, new mud, and marsh. In this region, the uplands are called 'Chars' while marshy areas are called 'Bils'. Bhangar and Khadar plains have characteristic features of the mature stage of fluvial erosional and depositional landforms such as sand bars, meanders, oxbow lakes, and braided channels. | Rajasthan Plain is formed by the river system of the Indus. It lies to the west of Aravallis. The Khadir is called Nali in northern Haryana which is the fertile prairie tract between the Ghaggar river and the southern limits of the Saraswati channel depression that gets flooded during the rains. |

**Q.23) Which of the following statements is incorrect about Ganga Plains?**

1. The general slope of the upper Ganga plain from North to South.
2. The Middle Ganga Plain covers the complete Uttar Pradesh excluding central Uttar Pradesh.
3. The lower Ganga plain includes the Ganga – Yamuna doab and Rohilkand division.

**Select the correct answer using the code given below:**

a) 1 and 2 only
b) 2 only

c) 2 and 3 only
d) 3 only

**Q.23) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Incorrect** | **Incorrect** |
| The upper Ganga Plain includes the Ganga – Yamuna doab, Rohilkand division, and parts of the Agra Division. The general slope is from North to South. It is one of the most productive parts of India in where the Green Revolution was a big success. | The Middle Ganga Plain includes central and eastern UP and the plain of Bihar up to Muzaffarpur. It has thick alluvial deposits with less Kankar formations. Being a low gradient plain, rivers often change their course. | The Lower Ganga Plain extends from Patna to the Bay of Bengal. Moving Eastward, the river suddenly changes its course towards the South and drains into Bay of Bengal. The upper Ganga Plain includes the Ganga – Yamuna doab, Rohilkand division, and parts of the Agra Division. |

**Q.24) Which of the following mountain ranges is not part of the Cordilleran region in North America?**

a) Rocky Mountains
b) Sierra Nevada
c) Cascade Range
d) Appalachian Mountains

**Q.24) Solution (d)**

**Explanation:**

Cordillera is a system of mountain ranges that often consist of a number of more or less parallel chains. Cordilleras are an extensive feature in the Americas and Eurasia. In North America the Rocky Mountains, the Sierra Nevadas, and the mountains between them are collectively known as the Cordilleras, and the entire area has been termed the Cordilleran

region. The term Cordillera is used with a directional modifier (e.g., Cordillera Oriental) to differentiate the various chains of the Andes Mountains as they extend through Colombia, Venezuela, Bolivia, and other countries in South America. **(Hence option d is incorrect)**

**Q.25) What is the term used to describe the abrupt southward bends of the Himalayas at their eastern and western extremities?**

a) Flexural bends
b) Syntaxial bends
c) Tectonic bends
d) Orographic bends

**Q.25) Solution (b)**

**Explanation:**

The general East-West trend of the Himalayas has terminated abruptly at the eastern and western extremities and ranges are sharply bent southwards in deep knee bend flextures. These are called Syntaxial bends. **(Hence option b is correct)**

**Q.26) What are the unconsolidated deposits found in the foreland basins of Mizoram?**

a) Alluvium
b) Loess
c) Molasses
d) Till

**Q.26) Solution (c)**

**Explanation:**

Mizoram is known as the LAND OF ROLLING MOUNTAINS, i.e. it has a huge number of mountain formations, most mountains are accompanied by the formation of a foreland basin or in simple terms valley-type depression that runs parallel to mountains. These depressions accumulate with unconsolidated deposits known as Molasses basin. **(Hence option c is correct)**

**Q.27) Consider the following statements.**

1. The Dooars are the alluvial floodplains in north-eastern India.
2. Rohi are the fertile tracts of land in the Rajasthan plains.

**Which of the following statements given above is/are incorrect?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.27) Solution (d)**

**Explanation:**

| **Statement 1** | **Statement 2** |
|---|---|
| **Correct** | **Correct** |
| The Dooars or Duars are the alluvial floodplains in north-eastern India that lie south of the outer foothills of the Himalayas and north of the Brahmaputra River basin. | Rohi are the fertile tracts of land in the Rajasthan plains composed of Rajasthan Bagar, which is a semi-arid plain in the eastern side of the desert. |

**Q.28) Which of the following statements is correct about the Peninsular plateau?**

1. The general elevation of the plateau is from the east to the west.
2. It spreads over three Indian states only.
3. An extension of the peninsular plateau is seen in the form of the Shillong and Karbi-Anglong plateau.

**Select the correct answer using the code given below:**

a) 1 and 2 only
b) 2 only
c) 2 and 3 only
d) 3 only

**Q.28) Solution (d)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Incorrect** | **Incorrect** | **Correct** |
| Rising from the height of 150 m above the river plains up to an elevation of 600-900 m is the irregular triangle known as the Peninsular Plateau. The general elevation of the plateau is from the west to the east, which is also proved by the pattern of the flow of rivers. | The Peninsular Plateau is a triangular-shaped tableland. It is part of an ancient land mass called Gondwana Level. The plateau has broad and shallow valleys and rounded hills. It is spread over the states of Gujarat, Maharashtra, Bihar, Karnataka and Andhra Pradesh. | Rising from the height of 150 m above the river plains up to an elevation of 600-900 m is the irregular triangle known as the Peninsular Plateau. Delhi Ridge in the northwest, (extension of Aravalis), the Rajmahal Hills in the east, the Gir range in the west, and the Cardamom hills in the south constitute the outer extent of the Peninsular plateau. However, an extension of this is also seen in the northeast, in the form of the Shillong and Karbi-Anglong plateau. |

**Q.29) With reference to the North Central Highlands, consider the following statements.**

1. The Great Boundary Fault separates Aravallis from the Vindhyan mountains.
2. The Malwa Plateau is bordered by the Vindhyan range in the North and Bundelkhand plateau in the East.
3. Baghelkhand region is drained by the Narmada and Son rivers.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) None

**Q.29) Solution (b)**

**Explanation:**

| Statement 1 | Statement 2 | Statement 3 |
|---|---|---|
| **Correct** | **Incorrect** | **Correct** |
| The Aravallis runs from North East to South West for 800 km between Delhi to Gujarat. The Great Boundary Fault (GBF) separates Aravallis from the Vindhyan mountains. | The Malwa Plateau is bordered by the Aravallis in the North, the Vindhyan range in the South, and the Bundelkhand Plateau in the East. Malwa plateau has two drainage systems, one towards the Arabian Sea (Narmada and Mahi) and the other towards the Bay of Bengal (Chambal, Sind, Betwa, Ken). | Baghelkhand includes the plateaus of Satna and Rewa in MP and Mirzapur in UP. Its elevation varies from 150 – 1200 m with uneven relief. The region is drained by the Narmada and Son Rivers. |

**Q.30) Consider the following statements.**

1. Karnataka Plateau spans in the state of Karnataka only.
2. The plateau of Telangana consists of Cuddapah rock formations.
3. Palakkad Gap connects the Kerala coast and Tamil Nadu highlands.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) None

**Q.30) Solution (b)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Incorrect** | **Correct** | **Correct** |
| The Karnataka Plateau plateau spans in the state of Karnataka and the Cannanore and Kozhikode districts of Kerala. The plateau has an average elevation of 600 – 900 m. The Northern upland of Karnataka plateau is called Malnad while the Southern part is called Maidan. It is drained by the Kaveri and Tungabhadra rivers. | The plateau of Telangana consists of Dharwar and Cuddapah rock formations. The area of Telangana State forms part of Southern Precambrian Tectonic Province or Southern Peninsular Shield and the shield elements are described under Dharwar Craton consisting of greenstone -granite suite with relative stability yielding relative older radiometric ages followed by intra-cratonic basins and are bordered by Eastern Ghats Mobile Belt (EGMB) having high-grade granulites with younger thermal events. | The Tamil Nadu uplands lie between the South Sahyadris and Tamil Nadu coastal plains. It is largely covered by Archean Rocks. At places, there are Cuddapah and Alluvial Formations. Between Coimbatore and Annamalai, there is a broad gap, known as Palakkad Gap. This is about 25 km wide and connects the Kerala coast and Tamil Nadu highlands. |

**Q.31) Which of the following statements are correct about Western Ghats?**

1. The western slope of Sahyadri is strep while the Eastern slope is gentle.
2. The windward side of the Western Ghats receives very little rainfall as compared to eastward.
3. Samudram Falls on the Kaveri River is the highest waterfall in India.
4. Sahyadris lies on the Western edge of the Deccan plateau.

**Select the correct answer using the code given below**:

a) 1 and 3 only
b) 1 and 4 only
c) 2, 3, and 4 only
d) 2 and 3 only

**Q.31) Solution (b)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** | **Statement 4** |
|---|---|---|---|
| **Correct** | **Incorrect** | **Incorrect** | **Correct** |
| The Western Ghats run parallel to the western coast for about 1600 km in the north-south direction from the mouth of the Tapi River to Kanyakumari. The western slope of Sahyadri is strep while the Eastern slope is gentle. | The windward side of the Western Ghats receives very high rainfall. Because of this, it has tropical rainforests. It is one of the biodiversity hotspots of the World. | Most of the important rivers of Peninsular India Godavari, Krishna, and Kaveri originate from the Western Ghats. Jog Falls on the Sharavati River is the highest waterfall in India. | The Western Ghats or Sahyadris lie on the Western edge of the Deccan plateau. It runs parallel to the western coast for about 1600 km. The average elevation of the Western Ghats is 1000 metres. |

**Q.32) Which of the following statements is correct about the Eastern Ghats?**

1. They run parallel to the east coast from the south of Mahanadi valley to the Nilgiri hills.
2. The area is drained by the Mahanadi and Godavari River systems.
3. The Eastern and the Western Ghats meet each other at the Nilgiri hills.

**Select the correct answer using the code given below:**

a) 1 and 2 only
b) 2 only
c) 2 and 3 only
d) 1, 2 and 3 only

**Q.32) Solution (d)**

**Explanation**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| The Eastern Ghats are discontinuous low belt. Their average elevation is 600 m. They run parallel to the east coast from the south of Mahanadi Valley to the Nilgiri hills. | The eastern ghat area is drained by the Mahanadi, Godavari, Krishna, and Kaveri river systems. The Nilgiri hills join the Western & Eastern Ghats in the south. The Western Ghats form one of the major watersheds of India, feeding many perennial river systems that drain almost 40% of the land area of the country. | The Western Ghats meet with the Eastern Ghats at Nilgiris before continuing south. There is also a massive crater impact happened which created an impact in between Nilgiri and Palani Hills which is named as Kavery Crater which is considered to be the third largest crater impact on earth. |

**Q.33) Which of the following is a consequence of the broader mountain topography in Karnataka?**

a) Higher temperatures
b) Lower humidity
c) More frequent droughts
d) Higher rainfall

**Q.33) Solution (d)**

**Explanation:**

The mountain topography in Karnataka is broader. Due to the greater width of the mountains, the rain-bearing winds have to necessarily travel a longer distance and have more time for the drops to coalesce and precipitate as rainfall, resulting in higher rainfall. In contrast, the narrow width of the Ghats in Maharashtra allows the rain-bearing wind to cross over to the leeward side rapidly before precipitation can occur. **(Hence option d is correct).**

**Q.34) With reference to Indian deserts, consider the following statements.**

1. The Indian desert was under the sea during the Mesozoic era.
2. Indian desert is the ninth largest desert in the world.
3. Except Luni River, all other streams appear only at the time of rainfall.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
**d)** None

**Q.34) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| It is believed that during the Mesozoic era, the Indian desert was under the sea. This can be corroborated by the evidence available at the wood fossils park at Aakal and marine deposits around Brahmsar, near Jaisalmer (The approximate age of the wood fossils is estimated to be 180 million years). | The Indian Desert lies towards the western margin of Aravali Hills. It is also called the Thar Desert. It is the ninth-largest desert in the world. It spreads over the states of Gujarat and Rajasthan. | Indian desert has semi-arid and arid weather conditions. It receives less than 150 mm of rainfall per year. The vegetation cover is low with thorny bushes. Luni is the main river in this area. All other streams appear only at the time of rainfall otherwise they disappear into the sand. |

**Q.35) Which of the following river forms the eastern boundary of the Thar Desert?**

a) Indus River
b) Yamuna River
c) Brahmaputra River
**d)** Sutlej River

**Q.35) Solution (d)**

**Explanation:**

The Indian Desert lies towards the western margin of Aravali Hills. It is also called the Thar Desert. The Thar Desert is bounded on the northwest by the Sutlej River, on the east by the Aravalli Range, on the south by the salt marsh known as the Rann of Kutch (parts of which are sometimes included in the Thar), and on the west by the Indus River. **(Hence option d is correct)**

**Q.36) Which of the following statements is correct about the Eastern Coastal Plains?**

1. The Eastern Coastal Plains lie between the Eastern Ghats and the Bay of Bengal.
2. The rivers flowing through this coastal plain do not form any delta.
3. These plains are also known as Northern Circars in the northern part between the Kaveri and Krishna rivers.

**Q.36) Solution (a)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Incorrect** |
| The Eastern Coastal Plains refers to a wide stretch of landmass of India, lying between the Eastern Ghats and the Bay of Bengal. | Deltas of many of India's rivers form a major portion of the eastern coastal plains. The Mahanadi, Godavari, Kaveri, and Krishna rivers drain these plains. The western coastal plains are narrow in the middle and get broader towards the north and south. The rivers flowing through this coastal plain do not form any delta. | The Eastern Coastal Plains is locally known as Northern Circars in the northern part between the Mahanadi and Krishna rivers and Coromandel Coast in the southern part between the Krishna and Kaveri rivers. Together these are known as eastern coastal plains. |

**Q.37) Consider the following statements regarding the Coastal Plains of India:**

**Statement I:** The Western Coastal Plains are suitable for the development of ports and harbors.
**Statement II:** The Western Coastal Plains are an example of emergent coastal plains.
**Statements III:** The Western Coastal Plains are characterized by the development of extensive deltas.

**Which one of the following is correct in respect of the statements given above?**

a) Both statement -II and statement -III are correct and both of them explain statement -I.
b) Both statement -II and statement -III are correct, but only one of them explains statement -I.
c) Only one of the statements II and III is correct, and that explains statement -I.
d) Neither Statement -II nor statement -III is correct.

**Q.37) Solution (d)**

**Explanation:**

- The Coastal plains of India are divided into two parts: the western coastal plains- plains between arabian sea coast and western ghats; and the eastern coastal plains- plains between bay of bengal coast and eastern ghats.
- The Western coastal plain provides natural conditions for the development of ports and harbors. Kandla, Mazagaon, JLN port Navha Sheva, Marmagao, Mangalore, Cochin, etc. are some of the important natural ports located along the west coast. **Hence, Statement I is correct.**
- The western coastal plains are an example of submerged coastal plain. Because of this submergence, it is a narrow belt and provides natural conditions for the development of ports and harbours. **Hence, statement II is incorrect.**
- The western coastal plains extend from the Gujarat coast in the north to the Kerala coast in the south. The western coast may be divided into following divisions – the Kachchh and Kathiawar coast in Gujarat, Konkan coast in Maharashtra, Goan coast in Karnataka and Malabar coast in Kerala.
- The rivers flowing through the western coastal plains do not form any delta. The eastern coastal plains have well-developed deltas, formed by the rivers flowing eastward in to the Bay of Bengal. These include the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri. Hence**, Statement III is incorrect**.

- **Hence, Neither Statement -II nor statement -III is correct.**

**Q.38) Which of the following islands in the Arabian Sea are located off the Kerala coast?**

a) Andaman and Nicobar Islands
b) Lakshadweep and Minicoy
c) Maldive Islands
d) Chagos Archipelago

**Q.38) Solution (b)**

**Explanation:**

The islands of the Arabian sea include Lakshadweep and Minicoy. These are scattered between 8°°N-12°°N and 71°°E -74°°E longitude. These islands are located at a distance of 220 km-440 km off the Kerala coast. The entire island group is built of coral deposits. There are approximately 36 islands of which 11 are inhabited. **(Hence option b is correct)**

**Q.39) With reference to the Malda fault, consider the following statements:**

1. It separates the Meghalaya plateau from the Chotanagpur plateau.
2. It is located in the state of Meghalaya.
3. It is also known as Garo-Rajmahal Gap.

**Which of the statements given above is/are correct?**

a) 1 and 2 only
b) 3 only
c) 1 and 3 only
d) 2 and 3 only

**Q.39) Solution (c)**

**Explanation:**

- The Meghalaya Plateau is detached from the Indian peninsula by Malda Gap. It was formed by down-faulting. Thus, the north-eastern parts are separated from the Chotanagpur plateau by the Malda fault. **Hence Statement 1 is correct.**
- Malda Gap is located in the state of West Bengal (and not Meghalaya). The Meghalaya plateau has been separated from the peninsular block by a wide gap known as the Malda Gap. **Hence Statement 2 is incorrect.**
- Malda fault is also known as Garo-Rajmahal Gap. An extension of the Meghalaya plateau can also be seen in the Karbi Anglong hills of Assam. **Hence Statement 3 is correct.**

**Q.40) Consider the following Neighbouring Countries of India:**

1. China
2. Nepal
3. Bangladesh
4. Pakistan

**Arrange the countries given above in the descending order of their border length with India:**

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

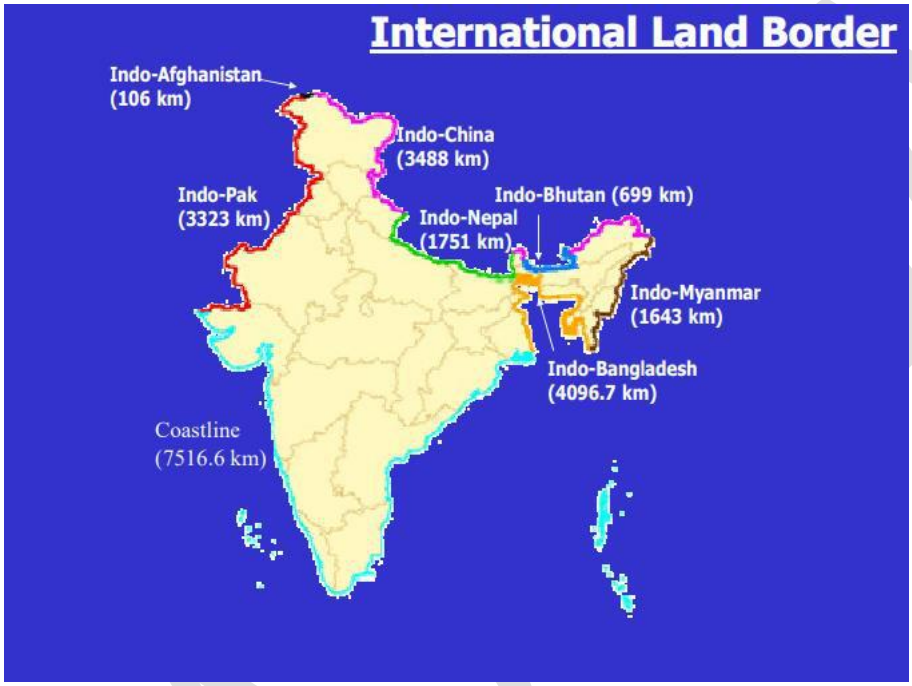
**Q.40) Solution (a)**

**Explanation:**

- India shares its land boundaries with Pakistan and Afghanistan in the northwest, China (Tibet), Nepal and Bhutan in the north and Myanmar and Bangladesh in the east. The southern neighbours across the sea consist of the two island countries, namely Sri Lanka and Maldives.
- **Option a is correct:** India has 15,106.7 Km of land border and a coastline of 7,516.6 Km including island territories. The length of our land borders with neighbouring

countries in descending order is as under-

| Name of the country | Length of the border (in Km) |
|---|---|
| Bangladesh | 4,096.7 |
| China | 3,488 |
| Pakistan | 3,323 |
| Nepal | 1,751 |
| Myanmar | 1,643 |
| Bhutan | 699 |
| Afghanistan | 106 |
| **Total** | **15,106.7** |




**Q.41) Which of the following are the favourable conditions for temperature inversion?**

1. Cloudless and clear sky
2. Short winter night
3. Dry air near the ground surface
4. The slow movement of air

**Select the correct answer using the code below:**

a) 1, 2 and 4
b) 2, 3 and 4
c) 1, 3 and 4
d) 1, 2, 3 and 4

**Q.41) Solution (c)**

**Statement Analysis:**

**Temperature inversion** is a reversal of the normal behaviour of temperature in the troposphere. Under this meteorological phenomenon, a layer of warm air lies over the cold air layer.

The favourable conditions for temperature inversion are:

- Cloudless and clear sky - Loss of heat through terrestrial radiation proceeds more rapidly without any obstruction. **Hence statement 1 is correct.**
- Long winter night - Loss of heat by terrestrial radiation from the ground surface during the night may exceed the amount of incoming solar radiation. **Hence statement 2 is incorrect.**
- Dry air near the ground surface - It limits the absorption of the radiated heat from the Earth's surface. **Hence statement 3 is correct.**
- The slow movement of air - It results in no transfer or mixing of heat in the lower layers of the atmosphere. **Hence statement 4 is correct.**
- Snow-covered ground surface - This results in a maximum loss of heat through the reflection of incoming solar radiation.

**Q.42) Consider the following statements:**

1. The equatorial low-pressure belt extends from the equator to 20$^{o}$N to 20$^{o}$S latitudes.
2. The sub-polar low-pressure belts extend between 45$^{o}$N and the Artic Circle in the northern hemisphere.
3. The sub-tropical high-pressure belts extend from the tropics to 35$^{o}$N latitudes in both hemispheres.

**How many of the statements is/are correct?**

a) Only one
b) Only two
c) All three
d) None

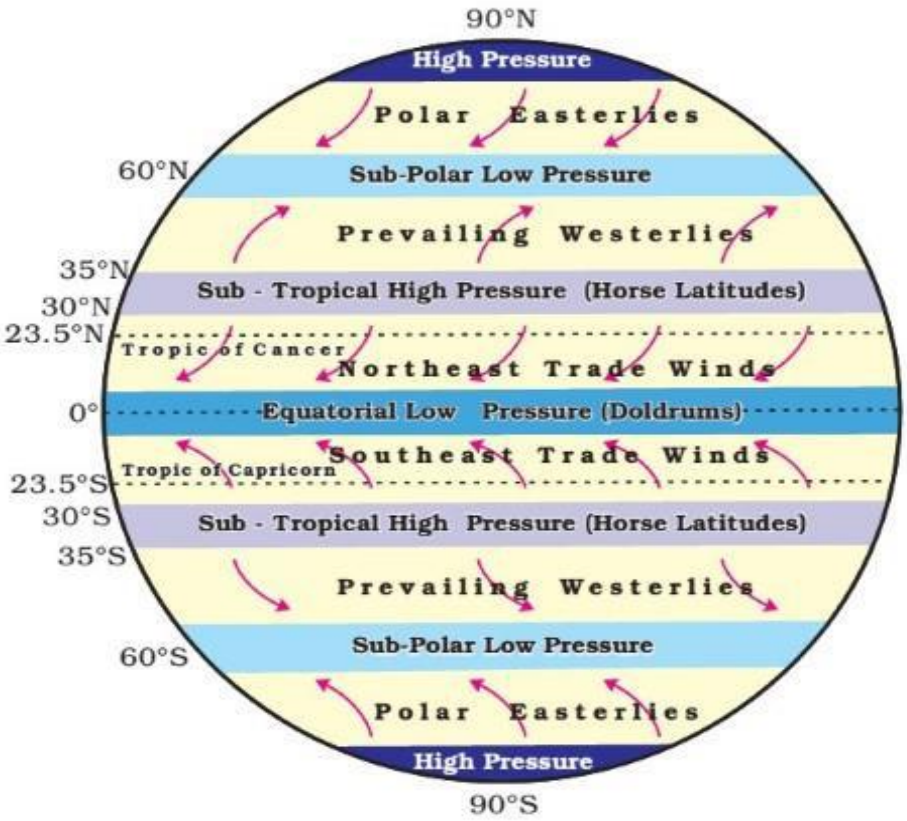
**Q.42) Solution (b)**

**Statement Analysis:**

- The equatorial low-pressure belt extends from the equator to 10$^{o}$N to 10$^{o}$S latitudes.
- The sun shines almost vertically on the equator throughout the year. As a result, the air gets warm and rises over the equatorial region producing equatorial low pressure. **Hence statement 1 is incorrect.**

- The sub-polar low-pressure belts extend between 45°N and the Arctic Circle in the northern hemisphere and between 45°S and the Antarctic Circle in the southern hemisphere. **Hence statement 2 is correct.**
- The sub-tropical high-pressure belts extend from the tropics to 35°N latitudes in both hemispheres.
- In the northern hemisphere, it is called the North sub-tropical high-pressure belt and in the southern hemisphere, it is called the South sub-tropical high-pressure belt. **Hence statement 3 is correct.**

**Q.43)**




*Major Pressure Belts and Wind System*

**Consider the following statements regarding Trade Winds:**

1. They blow from the sub-tropical high-pressure areas towards the equatorial low-pressure belt.
2. They flow as the north-eastern trades in the northern hemisphere and the south-eastern trades in the southern hemisphere.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.43) Solution (c)**

**Statement Analysis:**

- The trade winds are those blowing from the sub-tropical high-pressure areas towards the equatorial low-pressure belt. **Hence statement 1 is correct.**
- Therefore, these are confined to a region between 30°N and 30°S throughout the earth's surface.
- They flow as the north-eastern trades in the northern hemisphere and the south-eastern trades in the southern hemisphere. **Hence statement 2 is correct.**
- Trade winds are descending and stable in areas of their origin (sub-tropical high-pressure belt), and as they reach the equator, they become humid and warmer after picking up moisture on their way.
- The trade winds from two hemispheres meet at the equator, and due to convergence they rise and cause heavy rainfall.

**Q.44) Consider the following pairs:**

| Local wind | Type of wind |
|---|---|
| 1. Mistral | Warm |
| 2. Chinook | Warm |
| 3. Loo | Warm |
| 4. Bora | Cold |

**How many pair/s is/are correctly matched?**

a) One pair
b) Two pairs
c) Three pairs
d) Four pairs

**Q.44) Solution (c)**

**Statement Analysis:**

| Local wind | Type of wind |
|---|---|
| 1. Mistral | Cold |
| 2. Chinook | Warm |
| 3. Loo | Warm |
| 4. Bora | Cold |
| 5. Gregale | Cold |
| 6. Pampero | Cold |
| 7. Sirocco | Warm |

| | |
|---|---|
| 8. Foehn | Warm |
| 9. Zonda | Warm |

**Hence option c is correct.**

**Q.45) Consider the following statements:**

1. Land and sea breezes are prevalent on the narrow strips along the coasts or a lake.
2. Land and sea breezes are caused due to the differential heating of land and water.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.45) Solution (c)**

**Statement Analysis:**

- Land and sea breezes are prevalent on the narrow strips along the coasts or a lake. **Hence statement 1 is correct.**
- Land and sea breezes are diurnal (daily) cycles, in which the differential heating of land and water produces low and high pressures. **Hence statement 2 is correct.**
- During the day when a landmass gets heated more quickly than the adjoining sea or large lake; air expands and rises. This process produces a local low-pressure area on land.
- Sea breeze then develops, blowing from the water (high pressure) towards the land (low pressure).
- The sea breeze begins to develop shortly before noon and generally reaches its greatest intensity during mid-day to late afternoon. These cool winds have a significant moderating influence in coastal areas.
- At night, the land and the air above it cool more quickly than the nearby water body.
- As a result, land has high pressure while the sea has comparatively a low-pressure area.
- The gentle wind begins to blow from land (high pressure) towards the sea (low pressure). This is known as a land breeze.

**Q.46) Consider the following statements regarding the significance of Jet Streams:**

1. They help in the maintenance of latitudinal heat balance by mass exchange of air.
2. They exercise an influence on the movement of air masses which may cause prolonged drought or flood conditions.

3. They help in determining the weather and the path and intensity of frontal precipitation and frontal cyclones.

**Select the correct answer using the code below:**

a) 1 and 2
b) 2 and 3
c) 1 and 3
d) 1, 2 and 3

**Q.46) Solution (d)**

**Statement Analysis:**

The strong and rapidly moving circumpolar upper westerly air circulation in a narrow belt of a few hundred kilometres width in the upper limit of the troposphere is called a jet stream.

The significance of Jet Streams:

- They help in the maintenance of latitudinal heat balance by mass exchange of air. **Hence statement 1 is correct.**
- The sub-tropical jet stream and some temporary jet streams together influence Indian monsoon patterns.
- They exercise an influence on the movement of air masses which may cause **prolonged drought or flood conditions**. **Hence statement 2 is correct.**
- Polar front jets help in determining the weather because they usually separate colder air and warmer air.
- Polar front jets also play a major role in determining the path and intensity of frontal precipitation and frontal cyclones. **Hence statement 3 is correct.**

**Q.47) Which of the following factors influence atmospheric stability and instability?**

1. Pressure
2. Topography
3. Humidity
4. Temperature

**Select the correct answer using the code below:**

a) 1 and 3 only
b) 2 and 4 only
c) 2, 3 and 4
d) 1, 2, 3 and 4

**Q.47) Solution (d)**

**Statement Analysis:**

Atmospheric stability and instability refer to the behaviour of air in the Earth's atmosphere. Stable air is characterized by a tendency to resist vertical motion, while unstable air is characterized by a tendency to rise and form clouds and precipitation.
The factors that influence atmospheric stability and instability are:

- Pressure: High-pressure systems are associated with stable atmospheric conditions, while low-pressure systems are associated with unstable conditions and the potential for storms and severe weather. **Hence statement 1 is correct.**
- Topography: The mountain ranges and other topographic features can affect atmospheric stability and instability by forcing air to rise or sink and creating areas of high and low pressure. **Hence statement 2 is correct.**
- Humidity: The amount of moisture in the air can affect atmospheric stability and instability, with moist air being more likely to rise and form clouds and precipitation. **Hence statement 3 is correct.**
- Temperature: Warm air is less dense than cold air and tends to rise, while cold air is denser and tends to sink. This creates differences in pressure that can lead to the formation of clouds and precipitation. **Hence statement 4 is correct.**

**Q.48) Consider the following statements regarding the classification of clouds based on the altitude**

1. Stratocumulus is a high cloud.
2. Nimbostratus is a low cloud.
3. Cirrostratus is a middle cloud.

**How many of the given statement/s is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.48) Solution (a)**

**Statement Analysis:**

| **Type of clouds** | **Clouds names** |
|---|---|
| High Clouds | • Cirrus<br>• Cirrostratus<br>• Cirrocumulus |

| | |
|---|---|
| Middle Clouds | • Altostratus<br>• Altocumulus |
| Low Clouds | • Stratocumulus<br>• Nimbostratus |

**Hence option a is correct.**

**Q.49) Consider the following statements:**

1. The precipitation in the form of hard-rounded pellets is known as hail.
2. The raindrop that evaporates before reaching the earth is known as sleet.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.49) Solution (a)**

**Statement Analysis:**

- The precipitation in the form of hard-rounded pellets is known as hail. Its size ranges from 5 mm and 50 mm. **Hence statement 1 is correct.**
- The raindrop that evaporates before reaching the earth is known as virage.
- Sleet is a frozen raindrop and refrozen melted snow. It is a mixture of snow and rain or merely partially melted snow. **Hence statement 2 is incorrect.**

**Q.50) Which of the following conditions are necessary for the formation of dew?**

1. Clear sky
2. Calm air
3. Low relative humidity
4. Cold and long nights

**Select the correct answer using the code below:**

a) 1, 3 and 4
b) 2 and 3 only
c) 3 and 4 only
d) 1, 2 and 4

**Q.50) Solution (d)**

**Statement Analysis:**

- When the moisture is deposited in the form of water droplets on cooler surfaces of solid objects (rather than nuclei in the air above the surface) such as stones, grass blades, and plant leaves, it is known as dew.
- The ideal conditions for its formation are a clear sky, calm air, high relative humidity, and cold and long nights. **Hence option d is correct.**
- For the formation of dew, the dew point must be above the freezing point.

**Q.51) Consider the following statements:**

1. Tropical cyclones form only on seas whereas temperate cyclones can form both on land and sea.
2. Tropical cyclones are confined to $35^o$ – $65^o$ N and S of the equator whereas temperate cyclones are confined to $10^o$ – $30^o$ N and S of the equator.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.51) Solution (a)**

**Statement Analysis:**

- Tropical cyclones have a thermal origin whereas temperate cyclones originate due to Coriolis force, movement of air masses, etc.
- Tropical cyclones form only on seas whereas temperate cyclones can form both on land and sea. **Hence statement 1 is correct.**
- In a tropical cyclone, heavy rainfall occurs but does not last beyond a few hours. If the cyclone stays in place, the rainfall may continue for many days.
- In a temperate cyclone, rainfall is slow and continues for many days, sometimes even weeks.
- Tropical cyclones are confined to $10^o$ – $30^o$ N and S of the equator whereas temperate cyclones are confined to $35^o$ – $65^o$ N and S of the equator. **Hence statement 2 is incorrect.**

**Q.52) Consider the following statements regarding Orographic Rainfall:**

1. In this type of rainfall, the leeward side gets heavy rainfall.

2. This rainfall is commonly seen in mountainous areas and along hills.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.52) Solution (b)**

**Statement Analysis:**

- When wind forces moist air landwards towards the mountain's terrain then the mountain further lifts the moist air in an upward direction that is into the atmosphere.
- Once the air reaches the atmosphere it cools down and undergoes a precipitation process. It is called orographic rainfall.
- The principal characteristic behind the orographic rainfall is that the windward slope gets heavy rainfall and the leeward side gets little rainfall which is known as the rain-shadow area. **Hence statement 1 is incorrect.**
- Mountains act as an obstacle that forces the vapour to rise which leads to orographic rainfall. This rainfall is commonly seen in mountainous areas and along hills. **Hence statement 2 is correct.**

**Q.53) Consider the following statements regarding Convectional Rainfall:**

1. It occurs when air on the surface of the earth is heated by the sun.
2. It usually occurs during the winter or the coldest part of the day.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.53) Solution (a)**

**Statement Analysis:**

- The formation of convectional rainfall occurs when air is on the surface of the earth or a few metres above the surface of the earth it is heated by the sun. **Hence statement 1 is correct.**

- Once the air is heated it becomes lighter and further, this lighter air rises and cools down and condenses on the condensation nuclei which are present in the atmosphere. This is because only a small surface of the area is covered by converging air.
- As soon as air converges it gets condense to form a thick cumulus cloud. As the cloud rises it becomes unstable and because of this instability cloud drops on the ground in the form of raindrops or rainfall.
- Convectional rainfall occurs usually in the summer or the hotter part of the day. **Hence statement 2 is incorrect.**
- The equatorial region and internal part of the continents mainly in the Northern hemisphere receive conventional rainfall.

**Q.54) Consider the following statements regarding the Urban Heat Island:**

1. It is a phenomenon in which certain pockets within a city are experiencing a higher heat load than its surrounding area.
2. It is caused due to buildings and houses in cities made up of concrete where the heat is trapped and not able to dissipate easily.
3. Green vegetation like plants, trees, and forests are prominent factors in regulating the incidences of urban heat islands.

**How many of the above statement/s is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.54) Solution (c)**

**Statement Analysis:**

- The urban heat island is a phenomenon in which certain pockets within a city are experiencing a higher heat load than its surrounding area. **Hence statement 1 is correct.**
- It is caused by buildings and houses in cities made up of concrete where the heat is trapped and not able to dissipate easily.
- Buildings in cities are often made of glass, bricks, cement, and concrete. All of them are dark-coloured materials, which attract and absorb more heat.
- For building simple urban dwellings to complex infrastructures, carbon-absorbing materials like asphalt and concrete are needed for the expansion of cities. They trap huge amounts of heat which increases the mean surface temperatures of urban areas. **Hence statement 2 is correct.**
- Green vegetation like plants, trees, and forests are prominent factors in regulating the incidences of urban heat islands.
- Transpiration is the phenomenon that plants carry to regulate temperature. **Hence statement 3 is correct.**

**Q.55) Consider the following statements regarding Rossby Waves:**

1. They are formed when polar air moves toward the Equator while tropical air is moving poleward.
2. They are a natural phenomenon that can be observed only in the atmosphere.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.55) Solution (a)**

**Statement Analysis**:

- Rossby waves are formed when polar air moves toward the Equator while tropical air is moving poleward. **Hence statement 1 is correct.**
- In planetary atmospheres, they are due to the variation in the Coriolis effect (When temperature contrast is low, the speed of the jet stream is low, and the Coriolis force is weak leading to meandering) with latitude.
- Rossby waves are a natural phenomenon that can be observed in the atmosphere and oceans due to the rotation of the earth. **Hence statement 2 is incorrect.**
- The existence of these waves explains the low-pressure cells (cyclones) and high-pressure cells (anticyclones).

**Q.56) Consider the following statements:**

1. The vertical transfer of heat by the movement of mass from one place to another is called convection.
2. The horizontal transfer of heat by the winds is called advection.
3. The transfer of heat at the zone of contact between the atmosphere and the earth's surface is called radiation.

**How many of the above statement/s is/are correct?**

a) Only one
b) Only two
c) All three
d) None

**Q.56) Solution (b)**

**Statement Analysis:**

- The vertical transfer of heat by the movement of mass from one place to another is called convection.
- The air of the lower layers of the atmosphere gets heated either by the earth's radiation or by conduction. The heating of the air leads to its expansion. Its density decreases and it moves upwards. **Hence statement 1 is correct.**
- The horizontal transfer of heat by the winds is called advection.
- The temperature of a place will rise if it lies on the path of winds coming from a warmer region.
- The temperature of a place will fall if it lies on the path of winds coming from a colder region. **Hence statement 2 is correct.**
- The transfer of heat at the zone of contact between the atmosphere and the earth's surface is called conduction.
- When the source of heat transmits heat directly to an object through heat waves, it is known as radiation. It is the process by which solar energy reaches the earth and the earth loses energy to outer space. **Hence statement 3 is incorrect.**

**Q.57) Consider the following statements:**

1. A line representing points of equal atmospheric pressure is called an isotherm.
2. A line representing points of equal temperature is called an isobar.

**Which of the statement/s given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.57) Solution (d)**

**Statement Analysis:**

- A line representing points of equal atmospheric pressure is called an isobar. **Hence statement 1 is incorrect.**
- A line representing points of equal temperature is called an isotherm. **Hence statement 2 is incorrect.**

**Q.58) Consider the following conditions:**

1. Clear sky
2. High relative humidity
3. Air temperature below freezing point
4. Cold night

**How many of the above are the conditions required for the formation of frost?**

a) Only one
b) Only two
c) Only three
d) All four

**Q.58) Solution (d)**

**Statement Analysis:**

Frost is water vapour, or water in gas form, that becomes solid. It usually forms on objects like cars, windows, and plants that are outside in air that is saturated or filled with moisture.
Conditions for the formation of frost are:

- It develops when the surface's temperature falls below the dew point of the surrounding air. It forms rapidly when the air is calm as the wind cannot carry away the heat from the surface, allowing it to cool more quickly.
- Its formation and saturation of the air are more likely to occur when there is a greater value of the relative humidity, the nearer the temperature of the air to the dew point temperature.
- It forms when the surface temperature falls below the dew point of the surrounding air during cold and long nights. On cold nights, when there is a greater temperature difference between the surface and the air, frost formation is more likely to happen. Also, longer nights give the surface more time to cool down.
- When condensation occurs below the freezing point (0° C), i.e., when the dew point is at or below the freezing point, frost forms on cold surfaces. Except that the air temperature must be at or below freezing point, the ideal conditions for the development of white frost are the same as those for the formation of dew.
  **Hence option d is correct.**

**Q.59) Consider the following pairs:**

| **Atmospheric Layer** | **Feature** |
|---|---|
| Troposphere | It contains the largest percentage of the mass of the total atmosphere. |
| Stratosphere | The coldest temperatures in Earth's atmosphere occur in this layer. |
| Mesosphere | It is the transitional zone between Earth's atmosphere and interplanetary space. |

**How many of the above pair/s is/are matched correctly?**

a) Only one

b) Only two
c) All three
d) None

**Q.59) Solution (a)**

**Statement Analysis:**

The atmosphere can be divided into layers based on its temperature. These layers are the troposphere, the stratosphere, the mesosphere, and the thermosphere. A further region, beginning about 500 km above the Earth's surface, is called the exosphere.

- The troposphere is the atmospheric layer closest to the planet and contains the largest percentage (around 80%) of the mass of the total atmosphere. Temperature and water vapor content in the troposphere decreases rapidly with altitude. The troposphere contains 99% of the water vapor in the atmosphere. Water vapor concentrations vary with latitude. They are greatest above the tropics, where they may be as high as 3%, and decrease toward the polar regions.
- The mesosphere is a layer extending from approximately 30 to 50 miles (50 to 85 km) above the surface and is characterized by decreasing temperatures. The coldest temperatures in Earth's atmosphere occur at the top of this layer, the mesopause, especially in the summer near the pole.
- The exosphere is the most distant atmospheric region from Earth's surface. In the exosphere, an upward travelling molecule can escape to space (if it is moving fast enough) or be pulled back to Earth by gravity (if it isn't) with little probability of colliding with another molecule. The altitude of its lower boundary, known as the thermopause or exobase, ranges from about 150 to 300 miles (250-500 km) depending on solar activity. The exosphere is a transitional zone between Earth's atmosphere and interplanetary space.

**Hence option a is correct.**

**Q.60) These clouds are towering or plume-shaped multi-level clouds that have an intimidating appearance. These clouds are also referred to as thunderclouds and they are the only type of clouds that can produce hail, thunder, and lightning.**

The above paragraph refers to which of the following types of cloud?

a) Cumulus
b) Cumulonimbus
c) Cirrostratus
d) Nimbostratus

**Q.60) Solution (b)**

**Statement Analysis:**

Cumulonimbus Clouds are towering or plume-shaped multi-level clouds that have an intimidating appearance. These clouds are also referred to as thunderclouds and they are the only type of clouds that can produce hail, thunder, and lightning. They are formed when there is a rapid rise or movement of warm and moist air. They can form at heights of more than 20 kilometer and are formed by the upward movement of warm, moist air. **Hence option b is correct.**

**Q.61) Which of the following statements are correct about Indian drainage system?**

1. Nearly 77 percent of the drainage area is oriented towards the Bay of Bengal.
2. Arabian Sea and Bay of Bengal drainages are separated from each other through the Delhi ridge.

**Select the correct answer using the code given below:**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.61) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** |
|---|---|
| **Correct** | **Correct** |
| Nearly 77 per cent of the drainage area consisting of the Ganga, the Brahmaputra, the Mahanadi, the Krishna, etc. is oriented towards the Bay of Bengal while 23 per cent comprising the Indus, the Narmada, the Tapi, the Mahi and the Periyar systems discharge their waters in the Arabian Sea. | Indian drainage system may be divided on various bases. On the basis of discharge of water (orientations to the sea), it may be grouped into: (i) the Arabian Sea drainage; and (ii) the Bay of Bengal drainage. They are separated from each other through the Delhi ridge, the Aravalis and the Sahyadris. |

**Q.62) With reference to drainage patterns, consider the following statements.**

1. Dendritic systems form in V-shaped valleys.

2. A parallel drainage system is a pattern of rivers caused by steep slopes.
3. Trellis drainage pattern is found in Chota Nagpur plateau.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) None

**Q.62) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| Dendritic drainage systems are the most common form of drainage system. Dendritic systems form in V-shaped valleys; as a result, the rock types must be impervious and non-porous. In a dendritic system, there are many contributing streams (analogous to the twigs of a tree), which are then joined together into the tributaries of the main river (the branches and the trunk of the tree, respectively). They develop where the river channel follows the slope of the terrain. | A parallel drainage system is a pattern of rivers caused by steep slopes with some relief. Because of the steep slopes, the streams are swift and straight, with very few tributaries, and all flow in the same direction. This system forms on uniformly sloping surfaces, for example, rivers flowing southeast from the Aberdare Mountains in Kenya. | The geometry of a trellis drainage system is similar to that of a common garden trellis used to grow vines. As the river flows along a strike valley, smaller tributaries feed into it from the steep slopes on the sides of mountains. This pattern is found usually in old degraded areas like Chota Nagpur plateau, Deccan plateau etc. |

**Q.63) How do tributaries enter the main river in a trellis drainage system?**

a) At a 45-degree angle

b) At a 60-degree angle
c) At a 90-degree angle
d) Parallel to the main river

**Q.63) Solution (c)**

**Explanation:**

The geometry of a trellis drainage system is similar to that of a common garden trellis used to grow vines. As the river flows along a strike valley, smaller tributaries feed into it from the steep slopes on the sides of mountains. These tributaries enter the main river at approximately 90degree angle, causing a trellis-like appearance of the drainage system. This pattern is found usually in old degraded areas like Chota Nagpur plateau, Deccan plateau etc. **(Hence option c is correct)**

**Q.64) Which of the following statements is correct about drainage patterns?**

1. The streams radiate inwards from a central high point in a radial drainage system.
2. There is no coherent pattern to the rivers and lakes in a deranged drainage system.
3. In India small Himalayan streams show annular drainage pattern.

**Select the correct answer using the code given below:**

a) 1 only
b) 1 and 2 only
c) 2 and 3 only
d) 1, 2 and 3

**Q.64) Solution (c)**

**Explanation:**

| Statement 1 | Statement 2 | Statement 3 |
|---|---|---|
| **Incorrect** | **Correct** | **Correct** |
| In a radial drainage system, the streams radiate outwards from a central high point. Volcanoes usually display excellent radial drainage. In India it is nicely exhibited by Amarkantak Mountain. | A deranged drainage system is a drainage system in drainage basins where there is no coherent pattern to the rivers and lakes. It happens in areas where there has been much geological disruption. The classic example is the Canadian Shield. | In an annular drainage pattern streams follow a roughly circular or concentric path along a belt of weak rock, resembling in plan a ring-like pattern. It is best displayed by streams draining a maturely dissected structural dome or basin where erosion has exposed rimming sedimentary strata of greatly varying degrees of hardness. In India many small Himalayan streams show this pattern. |

**Q.65) Consider the following statements.**

1. The drainage basin collects all the water within the area covered by the basin and channeling it to different points.
2. All drainage basins are hydrologic units but not all hydrologic units are drainage basins.

**Which of the following statement given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and
d) Neither 1 nor 2

**Q.65) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** |
|---|---|
| **Correct** | **Correct** |
| A drainage basin or catchment area is any area of land where precipitation collects and drains off into a common outlet, such as into a river, bay, or other body of water. The drainage basin acts as a funnel by collecting all the water within the area covered by the basin and channeling it to a single point. Each drainage basin is separated topographically from adjacent basins by a perimeter, the drainage divide, making up a succession of higher geographical features (such as a ridge, hill or mountains) forming a barrier. | Drainage basins are similar but not identical to hydrologic units, which are drainage areas delineated so as to nest into a multi-level hierarchical drainage system. Hydrologic units are defined to allow multiple inlets, outlets, or sinks. In a strict sense, all drainage basins are hydrologic units but not all hydrologic units are drainage basins. |

**Q.66) With reference to drainage basins, consider the following statements.**

1. Endorheic drainage basins do not drain to an ocean.
2. The areas around Lakes of Rajasthan act as endorheic drainage basin.
3. The Great Basin in the United States is a endorheic region.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) None

**Q.66) Solution (b)**

**Explanation:**

| Statement 1 | Statement 2 | Statement 3 |
|---|---|---|
| **Incorrect** | **Correct** | **Correct** |
| Endorheic drainage basins are inland basins that do not drain to an ocean. Around 18% of all land drains to endorheic lakes or seas or sinks. The largest of these consists of much of the interior of Asia, which drains into the Caspian Sea, the Aral Sea, and numerous smaller lakes. | In endorheic bodies of standing water where evaporation is the primary means of water loss, the water is typically more saline than the oceans. An extreme example of this is the Dead Sea. In India lakes of Rajasthan, Bhopal, Bangalore acts as inland sink are area around them act as endorheic drainage basin. | Endorheic drainage basins are inland basins that do not drain to an ocean. The endorheic regions include the Great Basin in the United States, much of the Sahara Desert, the drainage basin of the Okavango River (Kalahari Basin), highlands near the African Great Lakes, the interiors of Australia and the Arabian Peninsula, and parts in Mexico and the Andes. |

**Q.67) Consider the following statements.**

1. The Trans-Himalayan Rivers originate beyond the Great Himalayas.
2. The Himalayan drainage system comprises of all the International Rivers of India.

**Which of the following statements given above is/are correct?**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.67) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** |
|---|---|
| **Correct** | **Correct** |
| On the basis of origin, two broad drainage systems are recognized, the Himalayan Drainage, the Peninsular Drainage. These rivers are again subdivided into two groups – Trans Himalayan and Himalayan. The Trans-Himalayan Rivers originate beyond the Great Himalayas. These are the Indus, the Sutlej and the Brahmaputra rivers. | Himalayan rivers are those which originate in the Himalayas and flow through the Northern Plains, e.g., the Ganga, the Yamuna and their tributaries. These rivers are useful for irrigation and navigation and the lowlands drained by them have fertile alluvial deposits. The Himalayan drainage system comprises of all the International Rivers of India i.e., Indus, Ganga and Brahmaputra. |

**Q.68) Which of the following is the reason for frequent change in course of Kosi River of Bihar?**

a) Due to heavy rainfall in its upper reaches
b) Due to the construction of dams and barrages
c) Due to the deposition of sediments in the plains
d) Due to the deforestation of its catchment area

**Q.68) Solution (c)**

**Explanation:**

River Kosi, also known as the 'sorrow of Bihar', has been notorious for frequently changing its course. The Kosi brings huge quantity of sediments from its upper reaches and deposits it in the plains. The course gets blocked, and consequently, the river changes its course. **(Hence option c is correct)**

**Q.69) Which of the following statements is correct Indus River system?**

1. It originates from a glacier near Bokhar Chu in the Kailash Mountain range.

2. It passes through Ladakh and enters into Pakistan in the Dardistan region.
3. The Indus flows in India only through Jammu and Kashmir.

**Select the correct answer using the code given below:**

a) 1 only
b) 1 and 2 only
c) 2 and 3 only
d) 1, 2 and 3

**Q.69) Solution (d)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| The Indus System It is one of the largest river basins of the world. The Indus also known as the Sindhu, is the westernmost of the Himalayan rivers in India. It originates from a glacier near Bokhar Chu (31°°15' N latitude and 81°°40' E longitude) in the Tibetan region at an altitude of 4,164 m in the Kailash Mountain range. | In Tibet, it is known as 'Singi Khamban; or Lion's mouth. After flowing in the northwest direction between the Ladakh and Zaskar ranges, it passes through Ladakh and Baltistan. It cuts across the Ladakh range, forming a spectacular gorge near Gilgit in Jammu and Kashmir. It enters into Pakistan near Chilas in the Dardistan region. | The Indus is a transboundary river of Asia and a trans-Himalayan river of South and Central Asia. The 3,180 km (1,980 mi) river rises in mountain springs northeast of Mount Kailash in Western Tibet, flows northwest through the disputed region of Kashmir, bends sharply to the left after the Nanga Parbat massif, and flows south-by-southwest through Pakistan, before emptying into the Arabian Sea near the port city of Karachi. |

**Q.70) The successive confluence of the five rivers of Punjab, the Panjnad is formed by which of the following rivers?**

a) Jhelum, Chenab, Ravi, Sutlej, and Beas

b) Indus, Jhelum, Chenab, Ravi, and Sutlej
c) Chenab, Ravi, Sutlej, Beas, and Yamuna
d) Indus, Ravi, Sutlej, Beas, and Yamuna

**Q.70) Solution (a)**

**Explanation:**

The Indus receives a number of Himalayan tributaries such as the Shyok, the Gilgit, the Zaskar, the Hunza, the Nubra, the Shigar, the Gasting and the Dras. It finally emerges out of the hills near Attock where it receives the Kabul river on its right bank. The other important tributaries joining the right bank of the Indus are the Khurram, the Tochi, the Gomal, the Viboa and the Sangar. They all originate in the Sulaiman ranges. The river flows southward and receives 'Panjnad' a little above Mithankot. The Panjnad is the name given to the five rivers of Punjab, namely the Satluj, the Beas, the Ravi, the Chenab and the Jhelum. **(Hence option a is correct)**

**Q.71) Which of the following statements are correct about tributaries of River Indus?**

1. Jhelum river joins the Chenab near Jhang in Jammu and Kashmir.
2. Ravi is the largest tributary of the River Indus.
3. The Beas flows form gorges in the Dhaoladhar range.
4. Chenab enters the Punjab plains where it meets the Satluj.

**Select the correct answer using the code given below:**

a) 1 and 3 only
b) 2 and 4 only
c) 1, 3 and 4 only
d) 1, 2 and 4 only

**Q.71) Solution (a)**

**Explanation:**

| Statement 1 | Statement 2 | Statement 3 | Statement 4 |
|---|---|---|---|
| **Correct** | **Incorrect** | **Correct** | **Incorrect** |
| The Jhelum, an important tributary of the Indus, rises from a spring at Verinag situated at the foot of the Pir Panjal in the south-eastern part of the valley of Kashmir. It flows through Srinagar and the Wular lake before entering Pakistan through a deep narrow gorge. It joins the Chenab near Jhang in Pakistan. | The Chenab is the largest tributary of the Indus. It is formed by two streams, the Chandra and the Bhaga, which join at Tandi near Keylong in Himachal Pradesh. Hence, it is also known as Chandrabhaga. The river flows for 1,180 km before entering into Pakistan. | The Beas is another important tributary of the Indus, originating from the Beas Kund near the Rohtang Pass at an elevation of 4,000 m above the mean sea level. The river flows through the Kullu valley and forms gorges at Kati and Largi in the Dhaoladhar range. It enters the Punjab plains where it meets the Satluj near Harike. | The Beas river flows through the Kullu valley and forms gorges at Kati and Largi in the Dhaoladhar range. It enters the Punjab plains where it meets the Satluj near Harike. |

**Q.72) Which of the following statements is correct the Ganga System?**

1. The Bhagirathi meets the Alaknanda at Devprayag.
2. The Alaknanda has its source in the Kafni glacier above Badrinath.
3. Ramganga, Gomati and Son are the left bank tributaries of river Ganga.

**Select the correct answer using the code given below:**

a) 1 only
b) 1 and 3 only
c) 2 and 3 only
d) 1, 2 and 3

**Q.72) Solution (b)**

**Explanation:**

| Statement 1 | Statement 2 | Statement 3 |
|---|---|---|
| **Correct** | **Incorrect** | **Correct** |
| The Ganga rises in the Gangotri glacier near Gaumukh (3,900 m) in the Uttarkashi district of Uttarakhand. Here, it is known as the Bhagirathi. It cuts through the Central and the Lesser Himalayas in narrow gorges. At Devprayag, the Bhagirathi meets the Alaknanda; hereafter, it is known as the Ganga. | The Alaknanda has its source in the Satopanth glacier above Badrinath. The Alaknanda consists of the Dhauli and the Vishnu Ganga which meet at Joshimath or Vishnu Prayag. | Ganga river system is the largest in India having a number of perennial and non-perennial rivers originating in the Himalayas in the north and the Peninsula in the south, respectively. The Son is its major right bank tributary. The important left bank tributaries are the Ramganga, the Gomati, the Ghaghara, the Gandak, the Kosi and the Mahananda. The river finally discharges itself into the Bay of Bengal near the Sagar Island. |

**Q.73) Which of the following river is formed by the confluence of the Kaligandak and Trishulganga?**

a) Chambal
b) Gandak
c) Ghaghara
d) Sarda

**Q.73) Solution (c)**

**Explanation:**

The Gandak comprises two streams, namely Kaligandak and Trishulganga. It rises in the Nepal Himalayas between the Dhaulagiri and Mount Everest and drains the central part of Nepal. It

enters the Ganga plain in Champaran district of Bihar and joins the Ganga at Sonpur near Patna. **(Hence option c is correct)**

**Q.74) With respect to rivers of India, consider the following statements.**

1. The Kosi is an antecedent river that forms Sapt Kosi after uniting with the river Arun.
2. The Ramganga rises in the Garhwal hills and joins the Ganga near Haridwar.
3. The Barakar is the main tributary of river Damodar.
4. The Son joins the Ganga as its last left bank tributary in West Bengal.

**How many of the above statements are correct?**

a) Only one
b) Only two
c) Only three
d) All four

**Q.74) Solution (b)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** | **Statement 4** |
|---|---|---|---|
| **Correct** | **Incorrect** | **Correct** | **Incorrect** |
| The Kosi is an antecedent river with its source to the north of Mount Everest in Tibet, where its main stream Arun rises. After crossing the Central Himalayas in Nepal, it is joined by the Son Kosi from the West and the Tamur Kosi from the east. It forms Sapt Kosi after | The Ramganga is comparatively a small river rising in the Garhwal hills near Gairsain. It changes its course to the southwest direction after crossing the Shiwalik and enters into the plains of Uttar Pradesh near Najibabad. Finally, it joins the Ganga near Kannauj. | The Damodar occupies the eastern margins of the Chotanagpur Plateau where it flows through a rift valley and finally joins the Hugli. The Barakar is its main tributary. | The Mahananda is another important tributary of the Ganga rising in the Darjiling hills. It joins the Ganga as its last left bank tributary in West Bengal. The Son is a large south bank tributary of the Ganga, originating in the Amarkantak plateau. After forming a series of waterfalls at the |

| | | | |
|---|---|---|---|
| uniting with the river Arun. | | | edge of the plateau, it reaches Arrah, west of Patna, to join the Ganga. |

**Q.75) Which of the following statement is correct about the Brahmaputrariver system.**

1. It originates in the Chemayungdung glacier of the Kailash range.
2. The Rango Tsangpo is the left bank tributary of Brahmaputra.
3. In Bangladesh, the Tista joins Brahmaputra on its right bank.

**Select the correct answer using the code given below:**

a) 1 only
b) 1 and 3 only
c) 2 and 3 only
d) 1, 2 and 3

**Q.75) Solution (b)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Incorrect** | **Correct** |
| The Brahmaputra, one of the largest rivers of the world, has its origin in the Chemayungdung glacier of the Kailash range near the Mansarovar lake. From here, it traverses eastward longitudinally for a distance of nearly 1,200 km in a dry and flat region of southern Tibet, where it is known as the Tsangpo, which means 'the purifier.' | The Rango Tsangpo is the major right bank tributary of Brahmaputra river in Tibet. It emerges as a turbulent and dynamic river after carving out a deep gorge in the Central Himalayas near Namcha Barwa (7,755 m). | In Bangladesh, the Tista joins it on its right bank from where the river is known as the Jamuna. It finally merges with the river Padma, which falls in the Bay of Bengal. The Brahmaputra is well-known for floods, channel shifting and bank erosion. |

**Q.76) Which of the following statement is correct about the Peninsular drainage system?**

1. The Peninsular drainage system is older than the Himalayan drainage system.
2. The Krishna is the east flowing Peninsular River which rises in Sahyadri
3. Most of the Peninsular rivers except Narmada and Tapi flow from east to west.

**Select the correct answer using the code given below:**

a) 1 only
b) 1 and 2 only
c) 2 and 3 only
d) 3 only

**Q.76) Solution (b)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Incorrect** |
| The Peninsular drainage system is older than the Himalayan one. This is evident from the broad, largely-graded shallow valleys, and the maturity of the rivers. The Western Ghats running close to the western coast act as the water divide between the major Peninsular rivers, discharging their water in the Bay of Bengal and as small rivulets joining the Arabian Sea. | The Krishna is the second largest eastflowing Peninsular river which rises near Mahabaleshwar in Sahyadri. Its total length is 1,401 km. The Koyna, the Tungbhadra and the Bhima are its major tributaries. Of the total catchment area of the Krishna, 27 per cent lies in Maharashtra, 44 per cent in Karnataka and 29 per cent in Andhra Pradesh and Telangana. | Most of the major Peninsular rivers except Narmada and Tapi flow from west to east. The Chambal, the Sind, the Betwa, the Ken, the Son, originating in the northern part of the Peninsula belong to the Ganga river system. The other major river systems of the Peninsular drainage are – the Mahanadi the Godavari, the Krishna and the Kaveri. Peninsular rivers are characterised by fixed course, absence of meanders and nonperennial flow of water. The Narmada and the Tapi which flow through the rift valley are, however, exceptions. |

**Q.77) Which of the following state has the largest portion of the Godavari River's catchment area?**

a) Maharashtra
b) Madhya Pradesh
c) Chhattisgarh
d) Andhra Pradesh

**Q.77) Solution (a)**

**Explanation:**

The Godavari is the largest Peninsular river system. It is also called the Dakshin Ganga. It rises in the Nasik district of Maharashtra and discharges its water into the Bay of Bengal. Its tributaries run through the states of Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha and Andhra Pradesh. It is 1,465 km long with a catchment area spreading over 3.13 lakh sq. km 49 per cent of this, lies in Maharashtra, 20 per cent in Madhya Pradesh and Chhattisgarh, and the rest in Andhra Pradesh. **(Hence option a is correct)**

**Q.78) What is the primary reason for the relatively consistent water flow in the Kaveri River throughout the year?**

a) Its origin in the Himalayas
b) Its extensive network of tributaries
c) The seasonal rainfall patterns in its catchment area
d) The construction of dams and reservoirs

**Q.78) Solution (c)**

**Explanation:**

The Kaveri rises in Brahmagiri hills (1,341m) of Kogadu district in Karnataka. Its length is 800 km and it drains an area of 81,155 sq. km. Since the upper catchment area receives rainfall during the southwest monsoon season (summer) and the lower part during the northeast monsoon season (winter), the river carries water throughout the year with comparatively less fluctuation than the other Peninsular rivers. About 3 per cent of the Kaveri basin falls in Kerala, 41 per cent in Karnataka and 56 per cent in Tamil Nadu. Its important tributaries are the Kabini, the Bhavani and the Amravati. **(Hence option c is correct)**

**Q.79) Which of the following statements are correct about Indian drainage system?**

1. Nearly 77 percent of the drainage area is oriented towards the Bay of Bengal.
2. Arabian Sea and Bay of Bengal drainages are separated from each other through the Delhi ridge.

**Select the correct answer using the code given below:**

a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

**Q.79) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** |
|---|---|
| **Correct** | **Correct** |
| Nearly 77 per cent of the drainage area consisting of the Ganga, the Brahmaputra, the Mahanadi, the Krishna, etc. is oriented towards the Bay of Bengal while 23 per cent comprising the Indus, the Narmada, the Tapi, the Mahi and the Periyar systems discharge their waters in the Arabian Sea. | Indian drainage system may be divided on various bases. On the basis of discharge of water (orientations to the sea), it may be grouped into: (i) the Arabian Sea drainage; and (ii) the Bay of Bengal drainage. They are separated from each other through the Delhi ridge, the Aravalis and the Sahyadris. |

**Q.80) With reference to drainage patterns, consider the following statements.**

1. Dendritic systems form in V-shaped valleys.
2. A parallel drainage system is a pattern of rivers caused by steep slopes.
3. Trellis drainage pattern is found in Chota Nagpur plateau.

**How many of the above statements are correct?**

a) Only one
b) Only two

c) Only three
d) None

**Q.80) Solution (c)**

**Explanation:**

| **Statement 1** | **Statement 2** | **Statement 3** |
|---|---|---|
| **Correct** | **Correct** | **Correct** |
| Dendritic drainage systems are the most common form of drainage system. Dendritic systems form in V-shaped valleys; as a result, the rock types must be impervious and non-porous. In a dendritic system, there are many contributing streams (analogous to the twigs of a tree), which are then joined together into the tributaries of the main river (the branches and the trunk of the tree, respectively). They develop where the river channel follows the slope of the terrain. | A parallel drainage system is a pattern of rivers caused by steep slopes with some relief. Because of the steep slopes, the streams are swift and straight, with very few tributaries, and all flow in the same direction. This system forms on uniformly sloping surfaces, for example, rivers flowing southeast from the Aberdare Mountains in Kenya. | The geometry of a trellis drainage system is similar to that of a common garden trellis used to grow vines. As the river flows along a strike valley, smaller tributaries feed into it from the steep slopes on the sides of mountains. This pattern is found usually in old degraded areas like Chota Nagpur plateau, Deccan plateau etc. |