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Q.1) With respect to the seismic waves consider the following statements:

1. Primary waves travel to and fro in the line of propagation and travel only in liquid medium
2. Secondary waves travel perpendicular to the line of propagation and they travel both in solid and liquid medium.

Which amongst the above statements is /are correct?

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

Q.1) Solution (d)

Basic Information:

- Seismic waves are waves of energy that travel through the Earth's layers, and are a result of earthquakes, volcanic eruptions, magma movement, large landslides and large man-made explosions that give out low-frequency acoustic energy.
- The place of occurrence of an earthquake is called 'focus' and the place which experiences the seismic event first is called 'epicenter'.
- Epicenter is located on the earth's surface and focus is always inside the earth.
- The propagation velocity of seismic waves depends on density and elasticity of the medium as well as the type of wave. Velocity tends to increase with depth through Earth's crust and mantle, but drops sharply going from the mantle to the outer core.
- Seismic waves are generally divided into 1. Primary waves, 2. Secondary waves and 3. Surface waves.

Primary waves:

- They are called longitudinal waves or compressional waves and are analogous to sound waves where particles move to and fro in the line of propagation.
- They travel both in solid and liquid medium.

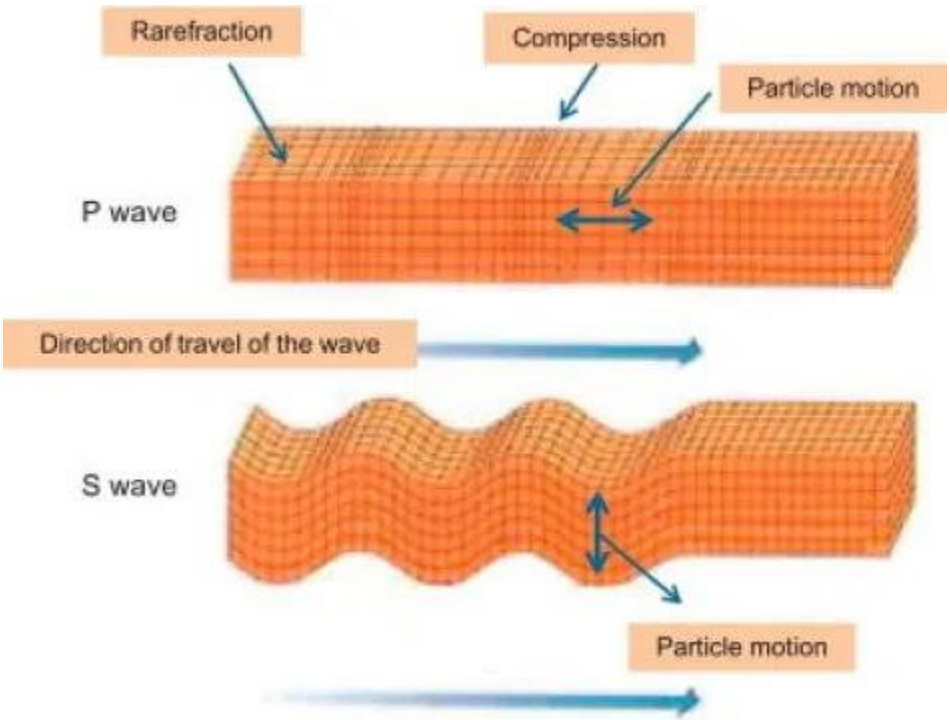
Secondary Waves:

- They are called transverse or distortional waves and are analogues to the water ripples where particles move perpendicular to the line of propagation.
- They cannot travel through liquid medium.

Surface waves:

- They are called long period waves

- They generally affect only the surface of the earth and die at smaller depth but are considered destructive compared to the ‘p’ and ‘s’ waves.



Statement Analysis:

Statement 1	Statement 2
Incorrect	**Incorrect**
Primary waves travel both in solid and liquid medium.	Secondary waves travel only in solid medium.

Q.2) Various sources of energy (Heat) act as force for the movement of plates in the earth crust. Which among the following are the sources of such energy?

1. Radioactive decay
2. Tidal forces generated due to attraction between SUN and MOON.
3. Residual heat from earth’s formation.

Choose the correct option.

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

Q.2) Solution (b)

Basic Information:

- As per the Plate tectonic theory, the surface of the earth and the interior are dynamic. The mobile rock beneath the rigid plates is believed to be moving in a circular manner.
- Heat within the earth comes from two main sources: radioactive decay and residual heat. This heat melts the rock beneath the plates and gives mobility. The mobile rock beneath the rigid plates is believed to be moving in a circular manner. The heated material rises to the surface, spreads and begins to cool, and then sinks back into deeper depths. This cycle is repeated over and over to generate a convection cell. This slow movement of mantle below the plates drives their movement.

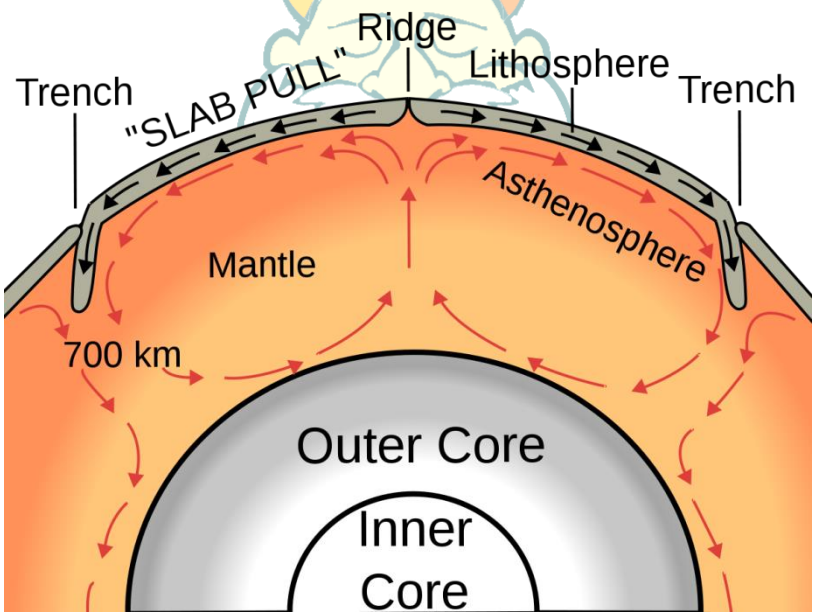


Image: Convective cell

- The radioactive decay of naturally occurring chemical elements like uranium, thorium, and potassium releases energy in the form of heat which slowly migrates toward the Earth's surface.

- Residual heat is gravitational energy left over from the formation of the Earth 4.6 billion years ago by the "falling together" and compression of cosmic debris.

Q.3) Which among the following is the evidence of Continental Drift theory proposed by Alfred Wegener?

a) Presence of Volcanic ridges along the mid-atlantic seabed.

b) Evidence of paleomagnetism along the atlantic seabed.

c) Evidence of Carboniferous glaciation of Brazil, South Africa and peninsular India.

d) Evidence of earthquakes along the coasts of the Atlantic ocean.

Q.3) Solution (c)

Basic Information:

According to Alfred Wegener's Continental drift theory earth's land had once been joined into a single supercontinent surrounded by an ocean. This continental mass started breaking up about 200 million years ago. Since then the pieces had moved to their present positions and are still moving.

Evidences in support of the theory

1. **"Jig saw" fit-** Wegener was struck by the geographical similarity between the opposite coasts of the Atlantic Ocean. The outlines of the two coasts appears to be the detached portion of the other ie. The east coast of north and South America can be exactly fit into the left coast of Africa and Europe.
2. **Geological structure**- there is remarkable similarity in geological structure along the two coasts of Atlantic. The best example is provided by the Appalachian mountains of North America which come right up to the coast and continue their trend across the ocean in old Hercynian Mountains of south west Ireland, Wales and central Europe. The opposite coasts of Africa and Brazil display even greater resemblance in their structure and rocks.

3. **Permo-carboniferous glaciations**- it presents a strong proof that at one point of time these land masses were assembled together , since the evidence of this glaciation are found in Brazil, Falkland island, South Africa, Indian peninsula as well as Australia. It is difficult to explain these extensive glaciations on the basis of existing distribution of

landmass and water. According to Wegener at the time of Pangaea, the South Pole was situated near Durban of the present coast of South Africa.

4. **Similar Fossil remains of terrestrial animals** are found on both coasts of the Atlantic. This cannot be possible if the two landmasses were not joined as it is quite impossible for these animals to swim across the Atlantic.

Q.4) What does the term 'Isostasy' refer to?

a) Mechanical stability between the upstanding relief features and low lying basins on a rotating earth.
b) Line joining similar relief features on the earth's surface.
c) Line joining similar relief features on ocean bed.
d) Energy equilibrium attained in the earth's interior due heat transfer between various layers within the earth.

Q.4) Solution (a)

Basic Information:

- The term "Isostasy" is derived from "Isostasios", a word of Greek language meaning the state of being in balance.
- Different relief features of varying magnitude for example mountains, plateaus, plains, lakes etc standing on the earth's surface are probably balanced by certain definite principal on a rotating earth. Otherwise, these would have not been maintained in their present form.
- Any disturbance in this balance results in violent earth movements and tectonic events.
- Thus 'Isostasy' is defined as the mechanical stability between the upstanding relief features and the low lying basins on a rotating earth.

Q.5) Which of the following landforms are formed by wind?

1. Yardang
2. Loess
3. Sand spit
4. Arete
5. Zeugen

Choose the correct option.

a) 1, 2 and 3 only
b) 1, 2 and 5 only
c) 1, 2, 3 and 5 only
d) All of the above

Q.5) Solution (b)

Explanation:

Agents	Erosive landforms	Depositional Landforms
Fluvial / Water channel/river	V-Shape valley, potholes, waterfalls, plunge pools, cascades, rapids, meanders	Oxbow lake, flood plain, braided channel, riverine island, natural levees, delta,
Aeolian/Wind	Blowout, mushroom rock, Yardang, Driekanter, Demoiselles, zeugen	Sand dunes, siefs, Nephka, Loess
Glacial	Arete, Cirque, Horn, U-shape valley, Hanging valley, Fjord	Outwash plain, eskers, drumlin, kettle holes, kame, morain
Sea waves	Notch, Cave, stack, cove,	Beach, sand bar, hook, loop, tombolo

Q.6) Which among the following are active volcanoes?

1. Mt. Cameroon.
2. Mt. Vesuvius.
3. Mt. Chimborazo.
4. Mt. Etna.
5. Mt Stromboli.

Choose the correct option

a) 2, 4 and 5 only
b) 1, 2, 4 and 5 only
c) 2, 3, 4 and 5 only
d) All of the above

Q.6) Solution (b)

Basic Information:

Active Volcanoes	Dormant Volcanoes	Extinct Volcanoes.
Mt. Cameroon, Mt Etna, Mt. Vesuvius, Mt Stromboli, Mt Saint Helena, Barren Island, Mt.Fuji.	Mauna Kea, Mt. Kilimanjaro, Mt. Hood, Mt.Pelee	Mt. Chimborazo, Ben Navis, Mt Kulal, Mt. Buninyong.

Q.7) "Gutenberg Discontinuity" in the earth's interior is found between which layers?

a) Between mantle and core.

b) Between upper and lower crust.

c) Between upper mantle and lower mantle.

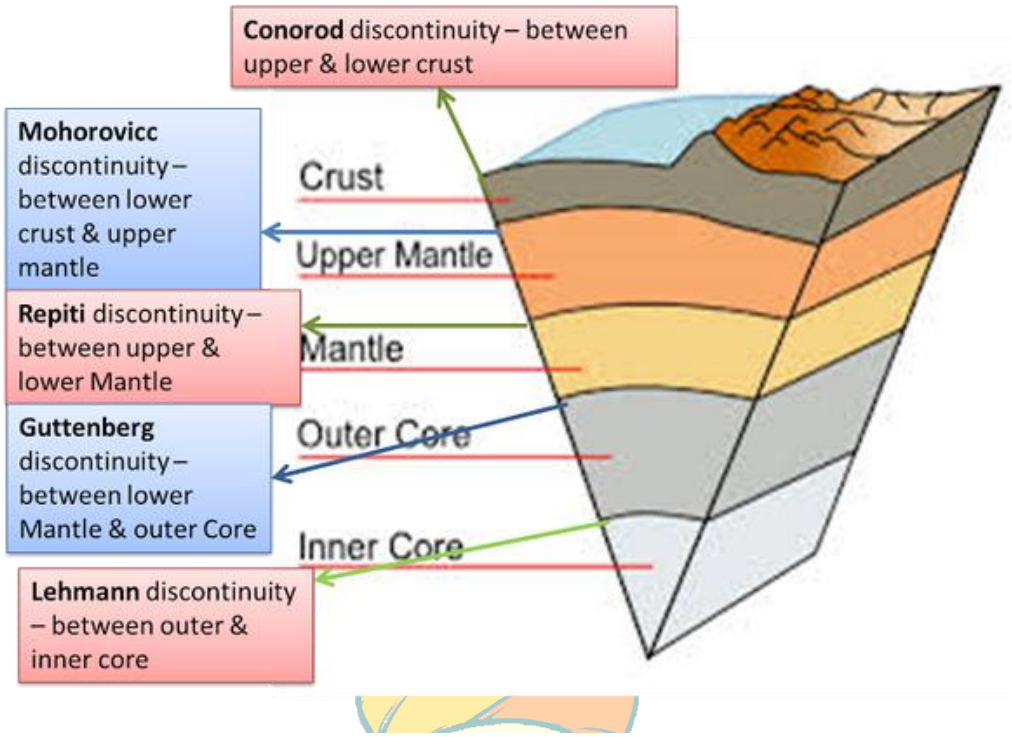
d) Between crust and mantle.

Q.7) Solution (a)

Basic Information:

Layers and discontinuities according to chemical properties

Discontinuity	Layer/Sub layer
Conrad Discontinuity	Upper crust and lower crust
Mohorovicic Discontinuity	Crust and mantle
Repetti Discontinuity	Upper mantle and lower mantle
Gutenberg Discontinuity	Mantle and core
Lehman Discontinuity	Outer core and inner core



Q.8) The drainage pattern of an area depends on various factors. Which among the following are the factors controlling the drainage pattern?

1. Rock type.
2. Geologic Structure.
3. Denudational history.
4. Climatic Conditions.

Choose the correct option

a) 1, 2 and 4 only
b) 1 and 2 only
c) 1, 2 and 3 only
d) All of the above

Q.8) Solution (d)

Basic Information:

- The flow of water through a particular channel is called drainage.
- In geomorphology, drainage systems, also known as river systems, are the patterns formed by the streams, rivers, and lakes in a particular drainage basin.

- Drainage pattern means spatial arrangement and form of drainage system in terms of geometrical shapes in the areas of different rock types, geologic structure, climatic conditions and denudational history.
- Various drainage patterns include.
    1. **Trellised Drainage pattern**: In this form the primary tributaries flow in parallel and secondary tributaries join them at right angles. Majorly found in higher altitudes of Himalayas.
    2. **Dendritic Drainage pattern**: In this form, the network of tributaries of various orders and magnitudes of the trunk or the master stream resembles the branches and roots of a tree. Best examples include the basins of river Cauvery, Mahanadi etc.
    3. **Radial Drainage pattern**: In this form, the streams diverge from central higher point. examples include the drainage pattern formed by South Koel, Subarnarekha in the Ranchi Plateau.
    4. **Centripetal Drainage pattern**: In this form, the streams converge at a point which is generally a depression or a basin. Best example is the Kathmandu Valley of Nepal.
    5. **Annular Drainage pattern**: In this form, the tributaries of the master stream are developed in the form of a circle. The sonapet dome of Uttaranchal presents the best example of this type of pattern.

Q.9) Which among the following is the major difference between the 'Geysers' and 'Hot Springs'?

a) Geysers spout hot water without any explosion while Hot springs spout hot water explosively.

b) Geysers are found in any part of the world while hot springs are specific to volcanic areas.

c) Geysers spout hot water explosively while hot springs spout hot water without any explosion.

d) Geysers spout hot water continuously while hot springs spout water intermittently.

Q.9) Solution (c)

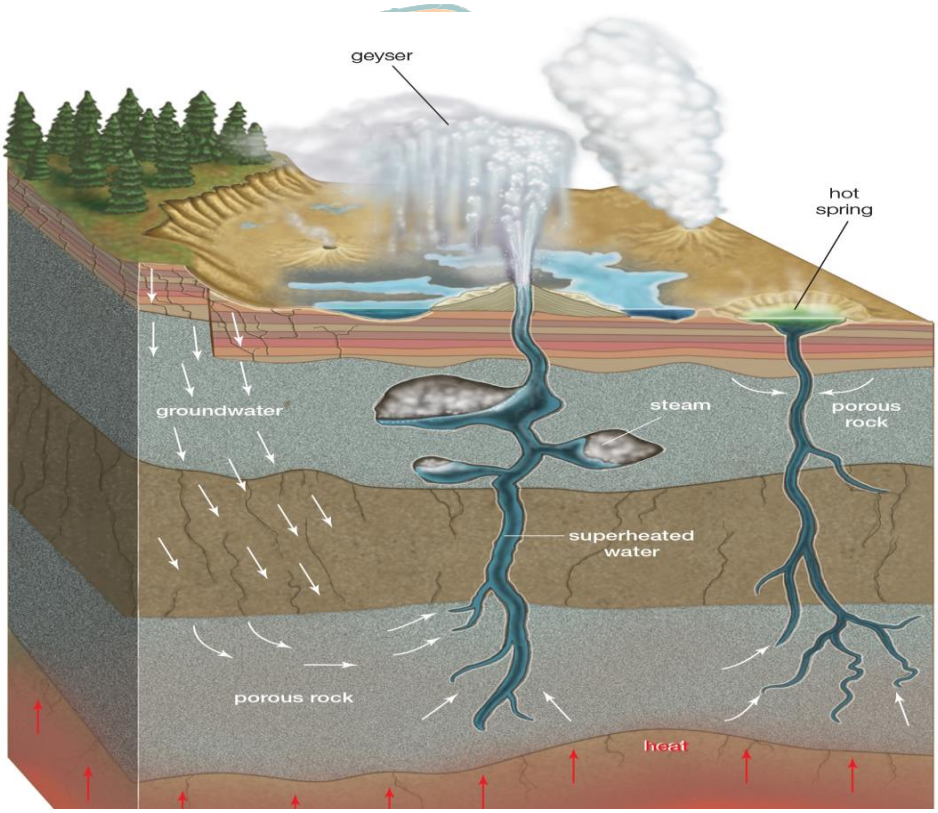
Basic Information:

Geysers:

- Geysers are fountains of hot water and superheated steam that may spout up to a height of 150 feet from the earth's beneath.
- The jet of water is usually emitted with an explosion.
- They are associated with volcanic regions or volcanic activity.
- Examples include Great Geyser of Iceland, Yellowstone National Park etc.

Hot Springs:

- In hot springs water rises to the surface without any explosion.
- In this water sinks deep enough beneath the surface to be heated by the interior forces.
- Such springs contain dissolved minerals.
- Examples include the hot springs of Yellowstone national park.



Q.10) Which among the following landforms are associated with the mature stage of development?

1. Gorges
2. Wide river valleys

3. Oxbow lakes.
4. Waterfalls
5. Meanders

Choose the correct option

a) 2, 3 and 5 only
b) 1, 2, 3 and 4 only
c) 1, 3, 4 and 5 only
d) All of the above

Q.10) Solution (a)

Basic Information:

According to the Davis's Cycle of Erosion there are three stages in the landform development. Youth stage, Matured stage and old stage

Stage of Development	Landforms
Youth	V-shaped valleys, rapids, streams, gorges, waterfalls
Mature	Wide shaped valleys, meanders, Oxbow lakes, river capture
Old stage	Undulating plain, Peneplain

Q.11) What does the term 'Knickpoint' in landform development refer to?

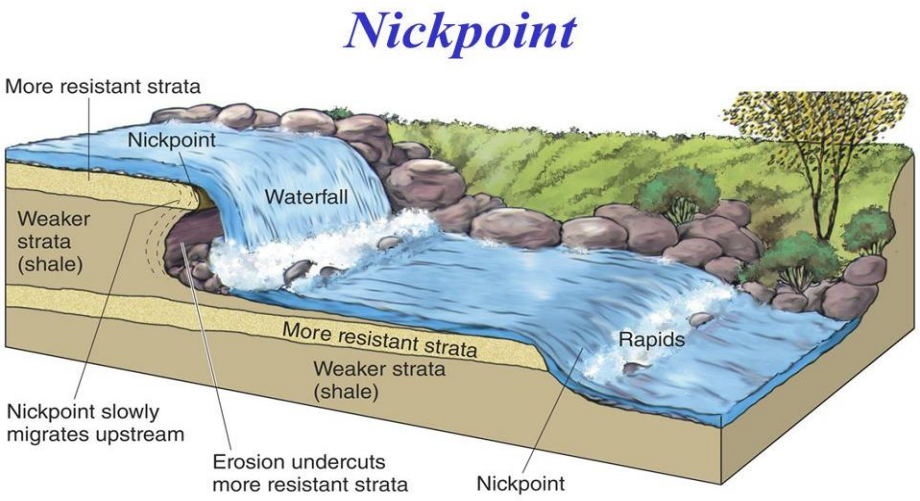
a) An elevated platform from which glacier descends.
b) Sharp bend in the river flow.
c) Part of a river where there is a sharp change in channel slope.
d) A landform associated with the old stage of development in denudational chronology.

Q.11) Solution (c)

Basic Information:

- In geomorphology, a knickpoint or Nickpoint is part of a river or channel where there is a sharp change in channel slope, such as a waterfall or lake.
- Knickpoints reflect different conditions and processes on the river, often caused by previous erosion due to glaciation or variance in lithology.

- In the cycle of erosion model, knickpoints advance one cycle upstream, or inland, replacing an older cycle.
- They are the result of rejuvenation.



Q.12) With respect to the Igneous rocks consider the following statements.

1. They are crystalline in structure.
2. They contain fossils.
3. They are resistant.

Which of the above statements is/are correct ?

a) 1 only
b) 1 and 3 only
c) 1 and 2 only
d) All three.

Q.12) Solution (b)

Basic Information:

- Igneous rock or magmatic rock, is one of the three main rock types, the others being sedimentary and metamorphic.
- They are formed by the cooling and solidification of molten rock from beneath the earth's crust.

Properties:

1. They are crystalline in structure.
2. They do not occur in strata (layers) and do not contain fossils.

3. They are hard and resistant compared to other rocks.

- In terms of origin there are two main classes of igneous rocks.
    1. Plutonic Rocks: These are formed at some depth in the earth's crust. They have cooled and solidified slowly so that large easily recognisable crystals have been formed. e.g, granite, gabbro etc.
    2. Volcanic rocks: They are molten rocks poured out of volcanoes as lavas. They solidify rapidly on earth's surface. e,g basalt.

Statement Analysis:

Statement 1	Statement 2	Statement 3
Correct	**Incorrect**	**Correct**
They are normally crystalline in structure	They do not contain fossils. Sedimentary rocks contain fossils.	They are hard and resistant due to the slow process of cooling and solidification.

Q.13) With respect to the metamorphic rocks consider the following pairs:

	Parent rock	Metamorphic rock
1.	Clay	Slate.
2.	Sandstone	Marble.
3.	Granite	Gneiss.
4.	Shale	Schist.

Which of the above pairs are correctly matched?

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

Q.13) Solution (c)

Explanation:

- The metamorphic rock structure and feature depends on the parent rock. Through various agents of climate and time period the parent rock converts into metamorphic rock.

Parent rock	Metamorphic rock
Clay	Slate
Limestone	Marble
Sandstone	Quartzite
Granite	Gneiss
Shale	Schist and slate
Coal	Graphite

Q.14) Which one of the following statements is the correct definition of Exorheic drainage basins?

a) These are inland drainage basins which do not drain into the ocean.
b) These are drainage basins that ultimately drain into the ocean.
c) These are drainage basins having features of erosional surfaces.
d) These are drainage basins in the karst Cuesta Topography.

Q.14) Solution (b)

Basic Information:

- An endorheic basin is a limited drainage basin that normally retains water and allows no outflow to other external bodies of water, such as rivers or oceans, but converges instead into lakes or swamps, permanent or seasonal, that equilibrate through evaporation. Such a basin may also be referred to as a closed or terminal basin or as an internal drainage system or interior drainage basin.
- Exorheic, or open lakes drain into a river, or other body of water that ultimately drains into the ocean.

Q.15) Landforms produced by the chemical weathering of carbonate rocks are called Karst Topography. Which among the following are necessary conditions for the formation of Karst topography?

1. Presence of massive limestones.
2. Carbonate rocks should be non-porous.
3. Carbonate rocks should be highly folded and faulted.
4. Substantial rainfall in the area.

Choose the correct option

a) 1, 3 and 4
b) 1, 2 and 4
c) 1, 2 and 3
d) All of the above

Q.15) Solution (d)

Basic Information:

- Karst is a topography formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterized by underground drainage systems with sinkholes and caves.

Conditions for development of Karst topography:

- Limestone must be massive, thickly bedded.
- Limestones should not be porous wherein permeability is largely controlled by joints and not by mass of the limestone. If they are porous then water will pass through the rock mass and the whole rock will become weak and will collapse.
- The carbonate rocks should be very close to the ground surface so that rainwater may easily and quickly infiltrate into the beds of limestone and may corrode the rocks to form solutional landforms.
- The limestones should be highly folded, fractured or faulted.
- There should be enough rainfall so that the required amount of water is available to dissolve carbonate rocks.

Q.16) With respect to the hypothesis of Sea-Floor spreading, consider the following statements.

1. Occurrence of shallow-foci earthquakes along mid-oceanic ridges.
2. Similar magnetic properties of rocks equidistant on either side of the crest of the mid-oceanic ridges.

Which among the above statements is/are correct?

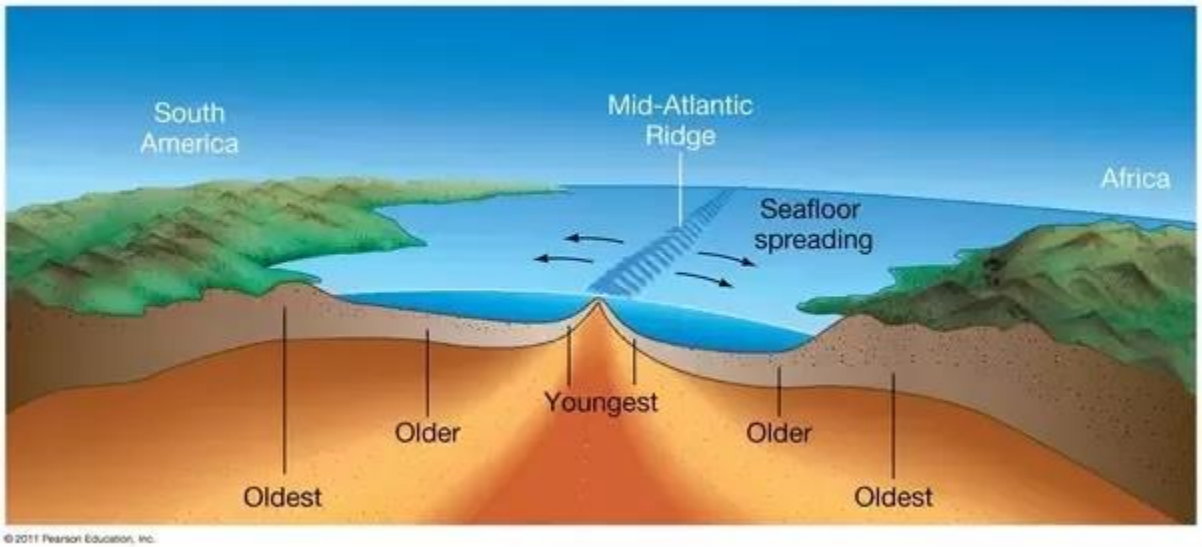
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2

Q.16) Solution (c)

Basic Information:

Sea-Floor Spreading:

- Seafloor spreading is a process that occurs at mid-ocean ridges, where new oceanic crust is formed through volcanic activity and then gradually moves away from the ridge.
- Seafloor spreading helps explain continental drift in the theory of plate tectonics.
- The hypothesis of seafloor spreading was forwarded by Harry Hammond Hess.
- The ocean floor that gets pushed due to volcanic eruptions at the crest, sinks down at the oceanic trenches and gets consumed. Hence the oceanic crust is simultaneously formed at the mid-oceanic ridge and consumed at oceanic trenches. Thus, ocean crust rocks are much younger than the continental rocks.



Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
	According to the hypothesis of seafloor spreading, constant eruptions at the crest of oceanic ridges caused the rupture of the oceanic crust and the new lava wedges into it, pushing the oceanic crust on either side. Thus

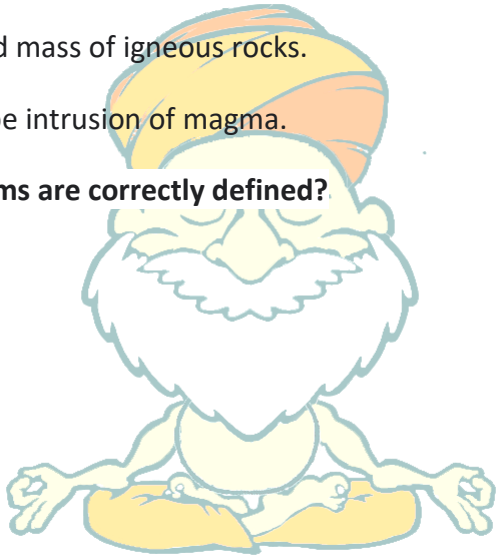
In the mid-oceanic ridge areas, the earthquake foci have shallow depths.	the rocks equidistant on either side of the crest of mid-oceanic ridges show remarkable similarities in terms of the period of formation, chemical compositions and magnetic properties.

Q.17) With respect to the intrusive landforms consider the following

1. Sills: Horizontal intrusion of magma.
2. Phacolith: Dome-shaped mass of igneous rocks.
3. Laccolith: lens shaped mass of igneous rocks.
4. Lopolith: Saucer shape intrusion of magma.

Which of the above landforms are correctly defined?

a) 1 only
b) 1 and 4 only
c) 2 and 3 only
d) All four



Q.17) Solution (b)

Basic Information:

- Volcanic landforms are divided into extrusive and intrusive landforms based on whether magma cools within the crust or above the crust.
- Magma while thrusting its way up to the surface may cool and solidify within the crust as plutonic rocks resulting in intrusive landforms.
- Magma that reach the surface and solidify form the extrusive landforms.

Intrusive landforms:

- **Sills:** When an intrusion of molten magma is made horizontally along the bedding planes of sedimentary rocks, the resulting intrusion is called a Sill.

- **Dyke:** Magma injected vertically are called Dykes.
- **Laccolith:** It is a large blister with a dome-shaped upper surface and a level base fed by the pipe like conduit from below.
- **Lopolith**: It is saucer shaped intrusion.
- **Phacolith**: It is a lens-shaped intrusion.

Q.18) What does the term 'Nappe' refer to?

a) A recumbent fold with one of its limbs perpendicular to the other.

b) A monoclinal fold with both limbs at gentle slope.

c) A symmetrical fold with both limbs inclined to each other.

d) Sheet of rock that has been moved a distance of about 2 km or more from its original position by faulting or folding.

Q.18) Solution (d)

Basic Information:

- In geomorphology Nappe refers to a large body or sheet of rock that has been moved a distance of about 2 km or more from its original position by faulting or folding.
- It is the result of complex folding mechanisms caused by intense horizontal movement and resulting compressive force.
- A nappe may be the hanging wall of a low-angle thrust fault (a fracture in the rocks of the Earth's crust caused by contraction), or it may be a large recumbent fold (i.e., an undulation in the stratified rocks of the Earth's crust having an essentially horizontal axial plane).
- Both processes position older rocks over younger rocks.
- In places, erosion may cut into the nappe so deeply that a circular or elliptical patch of the younger, underlying rock is exposed and completely surrounded by the older rock; this patch is called a fenster, or window.

Q.19) Consider the following statements with respect to fold mountains.

1. They are the youngest mountains on the earth's surface.
2. These are formed due to the folding of the igneous rocks only.

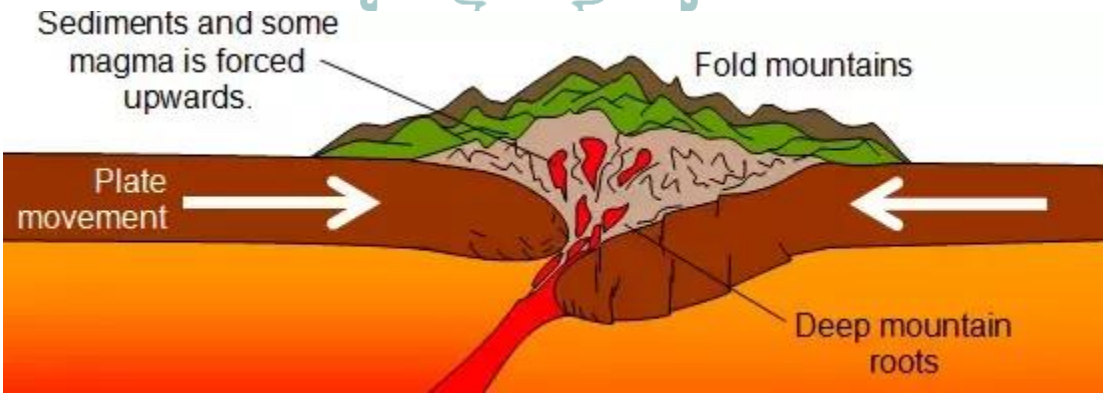
Which among the above statement is/are correct?

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

Q.19) Solution (a)

Basic Information:

- Fold mountains are formed due to folding of crustal rocks by compressive forces generated by endogenetic forces coming from within the earth.
- These are the youngest, highest and extensive mountains of the world and are found in all continents.
- Examples include Rockies, Andes, Alps, Himalayas etc.
- On the basis of the nature of folds they are categorised into simple folded mountains (folds are arranged in simple wave-like pattern) and complex folded mountains (they have complex structure of intensely compresses folds).



Statement analysis:

Statement 1	Statement 2
Correct	**Incorrect**
Fold mountains are the youngest compared to block mountains on the earth's surface.	The lithological characteristics of folded mountains reveal that these have been formed due to folding of **sedimentary and**

	Igneosu rocks by strong compressive forces. Folding is rarely seen in metamorphic rocks.

Q.20) 'Exfoliation' is a type of

a) Mechanical weathering caused by fluvial processes.
b) Chemical weathering caused by glacial processes.
c) Mechanical weathering caused by unloading and expansion.
d) Chemical weathering caused due to acid rain.

Q.20) Solution (c)

Basic Information:

- Weathering is the breaking down of rocks, soil, and minerals as well as wood and artificial materials through contact with the Earth's atmosphere, water, and biological organisms. Weathering occurs in situ (on site), that is, in the same place, with little or no movement.

There are two types of weathering

1. Physical or mechanical weathering.
2. Chemical weathering.

Exfoliation:

- It is a form of mechanical weathering. Also known as onion weathering.
- It refers to the peeling off concentric shells of rocks due to combined actions of heat and wind in the arid and semi-arid regions and monsoon lands.
- It is more common over crystalline rocks.
- When a mass of rock is exposed by weathering and removal of the overlying rock, there is a decrease in the confining pressure on the rock, and the rock expands. This unloading promotes cracking of the rock, known as exfoliation.
- The outer shells of the rocks become loose due to alternate expansion and contraction due to high temperature during day time and comparatively low temperature during night time respectively and these loosened shells are removed (peeled off) by strong winds.
- Example: Kanke dome near Ranchi exhibits the best example of such a weathering process.

Q.21) With respect to the geological history of India consider the following statements.

1. Over two-thirds of the peninsular surface is covered by Archaean rock Gneiss.
2. Gondwana rocks contain about 98 percent of coal reserves of India.

Which of the above statements are correct?

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

Q.21) Solution (c)

Basic Information:

- Geologically Indian rock system can be divided into four major divisions.
    1. The Archaean Rock System (about 4000-1000 million years ago)
    2. The Purana Rock System (1400-600 million year ago)
    3. The Dravidian Rock System (600-300 million years ago)
    4. The Aryan Rock System (300 million years ago to recent times)
- The Archaean system is the oldest and they include two groups 1. Archaean group of Gneiss and Schists and 2. Dharwar system.
- The Purana system includes two major groups 1. The Cuddapah system and 2. The Vindhyan system.
- The Dravidian system is mostly found in extra-peninsular regions and they consist of abundant fossils. The rocks of cambrian, Ordovician, Silurian, Devonian and Carboniferous periods are included in the Dravidian system.
- The Aryan rock system is the newest and includes Gondwana rock system, Triassic system, Jurassic system, tertiary system (Eocene, Oligocene, Miocene and Pleistocene)) and Cretaceous system. The Deccan Trap of the peninsular block belongs to this period.

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
The Archaean system of Gneiss covers about two-thirds of the peninsular block. They are azoic and highly crystalline in structure.	The Gondwana system belongs to the Aryan rock system. It consists of sandstones with some shales and clays. They are continental origin, fluviatile and lacustrine deposits laid down in geosynclinal troughs on ancient

	plateau surface. The main areas of these rocks are in the peninsula along the Damodar valley in Jharkhand, along Mahanadi valley in Chhattisgarh and Orissa, in southern parts of Madhyapradesh and a series of troughs along the Godavari. Economically they are significant because over 98 percent of the coal reserves of India belong to this rock system.

Q.22) Which of the following are categorised as glacial lakes in India?

1. Roopkund
2. Chandra tal
3. Surajkund
4. Tsongmo
5. Wular.

Choose the correct option:

a) 1, 2, 4 and 5
b) 1, 2 and 4
c) 1, 2, 3 and 5
d) All of the Above.

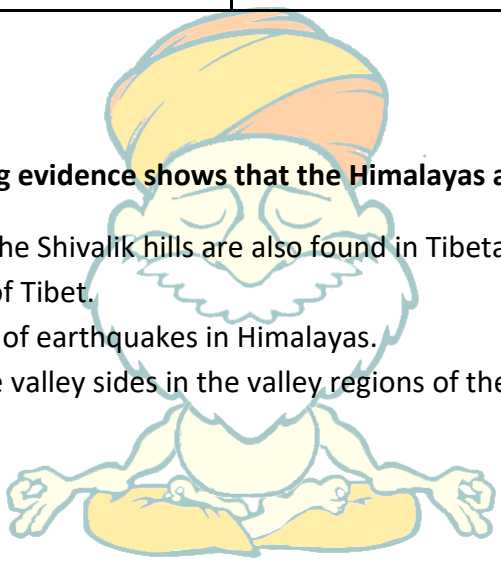
Q.22) Solution (b)

Basic Information:

List of Glacial Lakes in India:

Lake	State/region
Roopkund	Uttarakhand
Chandra Tal	Himachal Pradesh
Tsongmo	Sikkim

Homkund	Uttarakhand
Kedartal	Uttarakhand
Satopanth Tal	Uttarakhand
Suraj Tal	Himachal Pradesh
Kailash Kund	Manasarovar region.
Gurudongmar	Sikkim
Sheshnag	Kashmir
Kaunsarnag	Kashmir



Q.23) Which of the following evidence shows that the Himalayas are still rising?

1. Fossil formations of the Shivalik hills are also found in Tibetan plateau.
2. Dessication of lakes of Tibet.
3. Frequent occurrence of earthquakes in Himalayas.
4. Terraces found at the valley sides in the valley regions of the Himalayas.

Choose the correct option:

a) 1 and 3 only
b) 1, 3 and 4 only
c) 1, 2 and 3 only
d) All of the above.

Q.23) Solution (d)

Basic Information:

- Many geologists have opined that the process of upliftment of the Himalayas is not yet complete and it is still under process. Following evidence can be cited to prove that Himalayas are still rising.
    1. **Fossil Formations:**

Some fossil formations found in the Shivalik hills and the TIbet plateau are similar indicating similar climate conditions in the past in both areas. Tibetan plateau has since risen to its present elevation.

2. **Dessication of lakes:**

   Dessication of lakes has been observed within the recent past. Surrounding these lakes, the sand and gravel terraces at higher levels above the present water level proves that water stood at much higher level till recent times.

3. **Occurrence of earthquakes:**

   Indicates that Himalayas have not yet attained Isostatic Equilibrium and they still continue to rise.

4. **Youthful stage of Himalayan rivers:**

   Himalayan rivers are still in their youthful stage with proof of rejuvenation.

5. **Terraces on valley sides:**

   Terraces found at the valley sides suggests rejuvenation of the valley region due to the uplift.

Q.24) Consider the following statements.

1. Dafla, Miri, Abor and Mishmi hills in Arunachal Pradesh are part of the Shivalik range.
2. 'Duns' are the seasonal streams found on the Southern side of the Shivaliks.

Which of the above statements is/are correct?

a) 1 only
b) 2 only
c) Both 1 and 2
d) None of the above.

Q.24) Solution (a)

Basic Information:

- The Shivalik comprises the outermost range of the Himalayas and is called the outer himalayas.

- It assumes a HogBack appearance due to its steep slopes.
- It runs almost parallel to lesser himalayas for a distance of about 2400 kms from the Potwar Plateau to the Brahmaputra valley.
- The width of the Shivaliks varies from 50 kms in Himachal Pradesh to less than 15 kms in Arunachal Pradesh.
- The Shivaliks have been formed of sands, gravels and conglomerates of the Mid-Pleistocene period.

Statement Analysis:

Statement 1	Statement 2
Correct	**Incorrect**
Shivaliks are known by different names in different areas. They are called 1. Jammu Hills in Jammu 2. Dafla, Miri, Abor and Mishmi hills in Arunachal Pradesh. 3. Dhang range 4. Dundwa range of Uttarakhand. 5. Chiria Ghat hills of Nepal.	The southern slopes of the Shivaliks are completely devoid of the forest cover particularly in Punjab and Himachal Pradesh. These are highly dissected by several seasonal streams locally called 'Chos'. 'Duns' or 'Duars' are plainal areas formed due to the draining away of the lakes in the himalayan regions. This occurs because the rivers cut their way through the ranges and drains the lakes formed earlier. The Duns are fertile areas.

Q.25) Which of the following is/are correctly matched with respect to the location of the passes of the Himalayas?

Pass	State
1. Aghil Pass	Jammu and Kashmir
2. Chang la	Himachal Pradesh.
3. Bom Di la	Sikkim
4. Shipki la	Himachal Pradesh

Choose the correct option:

a) 1 and 4 only
b) 1 and 3 only
c) 1, 3 and 4 only
d) All of the above.

Q.25) Solution (a)

Basic Information:

Name of the state	Name of the passes
Jammu Kashmir,	Mintaka Pass, Parpik Pass, Khunjerab pass, Aghil Pass, Banihal pass, Chang La, Khardung La, Lanak La, Pir panjal, Qara Tag La, Imis La, Pensi La, Zoji La
Himachal Pradesh	Bara Lacha La, Debsa Pass, Rohtang pass, Shipki la,
Uttarakhand	Lipu Lekh, Mana Pass, Mangsha Dhura, Niti Pass, Muling La.
Sikkim	Nathu la, Jelep la.
Arunachal Pradesh	Bom Di La, Dihang Pass, Yonggyap Pass, Dipher Pass, Kumjawng Pass, Hpungan Pass, Chankan Pass

Q.26) What does the term 'Tarai' with respect to physiography of Northern plains of India refer to?

a) Coarse pebble belt along the foothills of the Shivaliks.
b) A marshy tract south of the Bhabar region in the Northern plains.
c) Old alluvium belt north of Bhangar region in Northern plains.
d) Newer alluvium belt north of Bhangar region in Northern Plains.

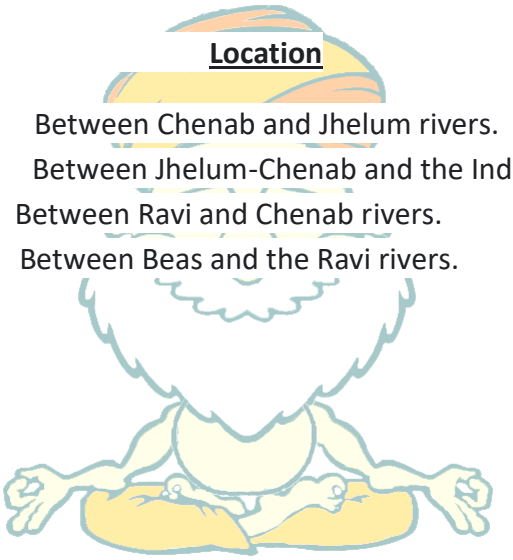
Q.26) Solution (b)

Basic Information:

- The Tarai is a lowland region in northern India and southern Nepal that lies south of the outer foothills of the Himalayas, the Sivalik Hills, and north of the Indo-Gangetic Plain.
- This lowland belt is characterised by tall grasslands, scrub savannah, sal forests and clay rich swamps.
- It is a 15-30 km wide marshy tract running parallel to the south of the Bhabar region in the Northern plains.
- Rivers reemerge in this region which makes the area wet.
- Most of the area in Punjab, Uttarpradesh and Uttarakhand is converted for agriculture purposes.

Q.27) With respect to the 'Doabs' of the Punjab Plains, which of the following are correctly matched?

Doab	Location
1. Chaj Doab	Between Chenab and Jhelum rivers.
2. Sind Sagar Doab	Between Jhelum-Chenab and the Indus rivers.
3. Rachna Doab	Between Ravi and Chenab rivers.
4. Bari Boab	Between Beas and the Ravi rivers.



Choose the correct option:

a) 1 and 4 only
b) 1 and 2 only
c) 1, 2 and 3 only
d) All of the above.

Q.27) Solution (d)

Basic Information:

- The land between two rivers is known as 'Doabs'.
- They are predominantly present in the Punjab Plains in Northern India.

Doab	Between the rivers
Bist-Jalandhar Doab	Between Beas and the Sutlej
Bari Doab	Between Beas and the Ravi

Rachna Doab	Between the Ravi and the Chenab
Chaj Doab	Between the Chenab and the Jhelum
Sind Sagar Doab	Between the Jhelum-chenab and Indus.

Q.28) Consider the following Himalayan Mountains:

1. Nandadevi
2. Kamet
3. Makalu
4. Dhaulagiri

Arrange the above from west to east direction

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

Q.28) Solution (a)

Explanation:

● From west to east direction Kamet comes first followed by Nandadevi, Dhaulagiri and Makalu.

Refer to the Map below.

Q.29) Consider the following statements

1. Karewas are thick deposits of glacial clay embedded with moraines.
2. Karewas are significant for the cultivation of Zafran.

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.29) Solution (c)

Basic Information:

- Karewas are glacio-fluvial lacustrine deposits of the Pliestocene age.
- They are predominant in the Valley of kashmir and the Bhadarwah of the Jammu division.
- Karewas were formed during the Pleistocene Period (1 million years ago), when the entire Valley of Kashmir was under water. Due to the rise of Pirpanjal, the drainage was impounded and a lake of about 5000 sq. km area was developed and thus a basin was formed. Subsequently, the lake was drained through Bramulla gorge. The deposits left in the process are known as karewas. The thickness of karewas is about 1400 m.

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
They are lacustrine deposits of glacial clay embedded with the moraines and other deposits.	The valley of Kashmir is known for Zafran cultivation (local name for Saffron) grown in the Karewa soils.

Q.30) What does the term 'Dhrian' with respect to Rajasthan deserts refer to?

a) Shifting sand dunes.
b) Oasis in the middle of the desert.
c) Dried up lakes.
d) Small Underground streams.

Q.30) Solution (a)

Basic Information:

- The sand dunes which are shifted as the windblown sand settlement in the Thar Desert are called the Dhrians.
- This is the local name which is given to the sand dunes of the Rajasthan Thar Desert.
- The depression of the sand which is blown from the Thar Desert of Rajasthan is called the Dhand.
- 'Rohi' is the fertile tract formed due to the drainage of the small streams originating from the Aravallis.

Q.31) Which of the following are categorised as saline lakes?

1. Sambhar lake.
2. Chilika lake.
3. Kolleru Lake.
4. Pulicat Lake.

5. Loktak lake

Choose the correct option:

a) 1, 2 and 4
b) 1, 2 and 3
c) 1, 2, 3 and 4
d) All of the above.

Q.31) Solution (a)

Basic Information:

Saline Water Lakes in India	Freshwater Lakes in India
Sambhar lake, Chilika lake, Pulikat lake, Pongong Tso lake, Vembanad lake, Degana lake, Didwana lake, Kuchaman in Rajasthan etc	Kolleru lake, Loktak lake, Sardar Sarovar lake, Indira Sagar lake, Chandratal, suraj tal, Deepor Beel. Sheshnag, Tso Moriri etc.

Q.32) Consider the following statements with respect to the peninsular plateau of India.

1. 'Malnad' refers to the rolling plains with low granitic hills in southern India.
2. The topography of Ranchi Plateau in Chotanagpur division is marked by the rounded hills of massive granite.

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.32) Solution (b)

Basic Information:

- The peninsular plateau constitutes the largest physiographic division of India facing Bay of Bengal in the east and the Arabian Sea in the west.
- It is like a tableland composed of the old crystalline, igneous and metamorphic rocks

- Its maximum length from Pachmarhi in the North to Cape Camorin in the South is 1600 Km and its maximum width from Sahyadri in the west to the Rajmahal Hills in the east is 1400 Kms.
- The plateau can be divided into five distinct subdivisions. 1. The Western Hills, 2. North Deccan Plateau, 3. South Deccan Plateau, 4. Eastern Plateau and 5. Eastern Hills.

Statement Analysis:

Statement 1	Statement 2
Incorrect	**Correct**
'Malnad' refers to the hilly area bordering the Sahyadri in the Karnataka plateau (South Deccan Plateau).	The Chotanagpur plateau in Eastern India consists of Ranchi Plateau and the Hazaribagh plateau.
'Maidan' refers to the rolling plains in north Karnataka consisting of the small granitic hills.	Ranchi plateau consists of the rounded granitic hills and slightly elevated terraces of older flood plains.

Q.33) Consider the following statements.

1. The Nilgiris join the Sahyadris near Gudalur.
2. The western ghats is separated from the main Sahyadri range by the palghat gap.

Which of the above statements is/are correct?

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

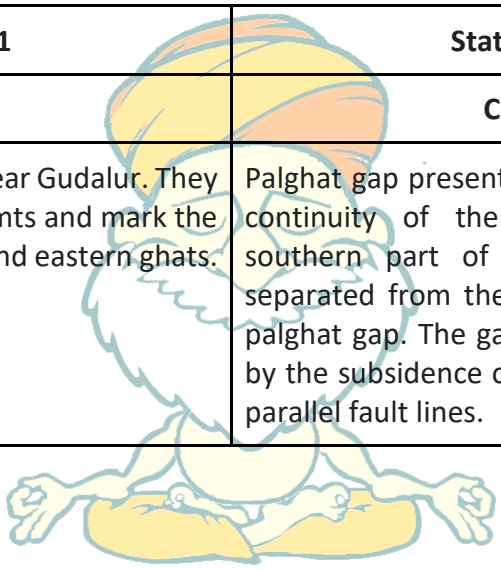
Q.33) Solution (c)

Basic Information:

- The Western Ghats or the Sahyadris form the western edge of the Deccan tableland.
- They run in north-south direction parallel and close to the Arabian Sea coast from Tapi valley (21 degree North latitude) to a little north of Kanniyakumari (11 degree North Latitude) for a distance of 1600 kms.
- Western ghats are steep sided, terraced, flat topped hills or cliffs presenting steppe topography.
- They are subdivided into 1. Northern Section (from 21-16 degree north latitude), 2. Middle Sahyadri (from 16 degree upto Nilgiris) and 3. The Southern section (From Palghat gap upto kanyakumari).

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
Nilgiris join the Sahyadris near Gudalur. They rise abruptly to over 2000 mts and mark the junction of western ghats and eastern ghats.	Palghat gap presents a sudden break in the continuity of the Sahyadri range. The southern part of the western ghats is separated from the main sahyadris by the palghat gap. The gap is a rift valley formed by the subsidence of the land between two parallel fault lines.



Q.34) Brahmaputra is the longest river in North-eastern India. With reference to this river, consider the following statements.

1. It originates in the Chemayungdung glacier of the Kailash range near Manasarovar lake.
2. It enters India in the Indian state of Arunachal Pradesh where it is known as the Siang river.

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.34) Solution (c)

Basic Information:

- The Brahmaputra, called Yarlung Tsangpo in Tibet, Siang River in Arunachal Pradesh and Luit in Assam is a trans-boundary river which flows through China, India and Bangladesh.
- It is the ninth largest river in the world by discharge, and the 15th longest.
- With its origin in the Manasarovar Lake region, near the Mount Kailash, located on the northern side of the Himalayas in Burang County of Tibet as the Yarlung Tsangpo River, it flows along southern Tibet to break through the Himalayas in great gorges (including the Yarlung Tsangpo Grand Canyon) and into Arunachal Pradesh.
- It flows southwest through the Assam Valley as Brahmaputra and south through Bangladesh as the Jamuna.
- In the vast Ganges Delta, it merges with the Padma, the popular name of the river Ganges in Bangladesh, and finally, after merging with Padma, it becomes the Meghna and from here, it flows as Meghna river before emptying into the Bay of Bengal.

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
Brahmaputra originates from the Chemayungdung glacier	It enters India in the Indian State of Arunachal Pradesh and is called Dihang or Siang locally.

Q.35) Which of the following are the tributaries of the Godavari river?

1. Penganga
2. Ib
3. Wardha
4. Wainganga
5. Jonk

Choose the correct option:

a) 1, 2 and 4

b) 1, 3 and 4
c) 1, 2, 3 and 4
d) All of the Above.

Q.35) Solution (b)

Basic Information:

Name of the river	Tributary
Ganga	Alaknanda, Pindar, Mandakini, Dhauliganga, Ramganga, Ghagra, Gandak, Kosi.
Yamuna	Chambal, Ken, Sind, Betwa.
Indus	Ravi, Chenab, Beas, Jhelum, Satluj.
Mahanadi	Ib, Mand, Hasdo, Sheonath, Ong, Jonk, Tel
Godavari	Manjra, Penganga, Wainganga, Wardha, Indravati, Sabari
Krishna	Koyna, Ghataprabha, Malaprabha, Bhima, Tungabhadra, Musi
Cauvery	Harangi, Hemavati, Shimsha, Arkavati, Lakshmana thirtha, Kabani
Narmada	Hiran, Barna, Kolar, Burher, Banjar, Shar, Tawa, Kundi
Tapi	Purna, Betul, Patki, Ganjal, Dathranj, Bokad, Amravati.

Q.36) Which fault separates Chota Nagpur Plateau from North Eastern Himalayan Mountains?

a) Bhima fault
b) Malda fault
c) Meghalaya fault
d) None of the above

Q.36) Solution (b)

Basic Information:

- In geology, a fault is a planar fracture or discontinuity in a volume of rock across which there has been significant displacement as a result of rock-mass movement. Large faults within the Earth's crust result from the action of plate tectonic forces, with the largest forming the boundaries between the plates.
- Bhima Fault is in the Bhima basin in the peninsular plateau. It has undergone significant seismic activities.
- Malda Fault is in West Bengal and separates Chotanagpur plateau from North Eastern Himalayan ranges.

Q.37) With respect to the west flowing rivers of India consider the following statements.

1. Although only about 3 percent of the arial extent of the basins of India is drained by these rivers, they contain about 18 percent of the country's water resources.
2. About six hundred small streams originate from the Western Ghats and flow into the Arabian sea.

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.37) Solution (c)

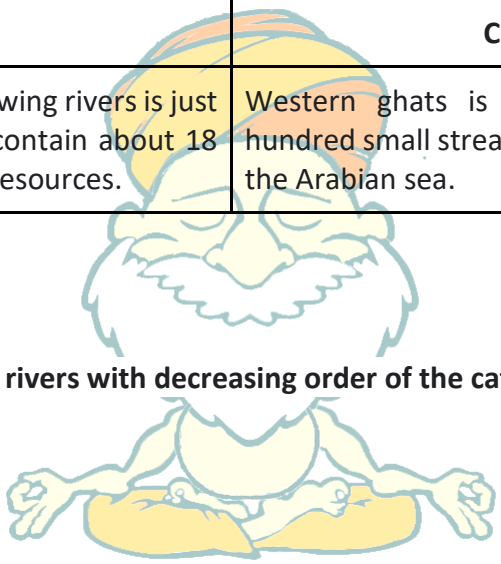
Basic Information:

- Hundreds of small streams originating in the Western Ghats flow swiftly westwards and join the Arabian Sea.

- But unique is the case of two major west flowing rivers narmada and Tapi. They originate in the Vindhyan mountains and don't form valleys but instead they flow through faults created due to the bending of the northern peninsula during the formation process of Himalayas.
- The Peninsular rivers which fall into the Arabian Sea do not form deltas, but only estuaries.
- Other west flowing rivers include Sabarmati, mahi, mandovi, Zuari, Rachol, Kalinadi, Bedti, Sharavati, Netravati, Beypore, Pannam, Bharatapuzha, Periyar, pamba etc.

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
The areal extent of west flowing rivers is just about 3 percent but they contain about 18 percent of countrys water resources.	Western ghats is the source of several hundred small streams. All of them flow into the Arabian sea.



Q.38) Arrange the following rivers with decreasing order of the catchment area.

1. Ganga
2. Brahmaputra
3. Mahanadi
4. Godavari
5. Cauvery

Choose the correct option:

a) 1-2-3-4-5
b) 1-2-3-5-4
c) 1-2-4-3-5
d) 1-4-2-3-5

Q.38) Solution (d)

Basic Information:

- Catchment area is the area of land from which the water flows into the river or lake or pond.

Name of river	Catchment areas (Sq kms)
Ganga	861452
Indus (In India)	321289
Brahmaputra	194413
Mahanadi	141589
Godavari	312812
Cauvery	81155
Krishna	258948

Q.39) With respect to Island groups in India consider the following statements.

1. The great Andaman group of Islands in the North is separated by Ten degree Channel from Nicobar group in the south.
2. Saddle peak in North Andaman is the highest peak in the Andaman and Nicobar.

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.39) Solution (c)

Basic Information:

- Andaman and Nicobar and the Lakshadweep group of Islands forms the largest group of Islands far away from the Indian Coast.
- The Andaman and Nicobar Islands, a Union territory of India comprising 572 islands of which 37 are inhabited, are a group of islands at the juncture of the Bay of Bengal and the Andaman Sea. The territory is about 150 km north of Aceh in Indonesia and separated from Thailand and Myanmar by the Andaman Sea. It comprises two island groups, the Andaman Islands (partly) and the Nicobar Islands, separated by the 150 km wide Ten Degree Channel, with the Andamans to the north of this latitude, and the Nicobars to the south. The Andaman Sea lies to the east and the Bay of Bengal to the west.
- Lakshadweep, formerly known as the Laccadive, is a group of islands in the Laccadive Sea, about 200 to 440 km off the southwestern coast of India. The islands north of 11 degree north latitude are known as Amindivi Island while those south of this latitude are called Cannonore Island. In the extreme south is the Minicoy Island.

Statement Analysis:

Statement 1	Statement 2
Correct	**Correct**
Ten degree channel separates Andaman group with the Nicobar group of Islands.	Saddle peak with height measuring 737 mts is the highest peak in the North Andaman.

Q.40) Which is the highest peak in the satpura range of peninsular India?

a) Dhupgarh
b) Astamba Dongar
c) Amarkantak
d) Guru Shikhar

Q.40) Solution (a)

Basic Information:

- Satpura is a series of seven mountains running in an east-west direction south of the Vindhyas and in between the Narmada and tapi, roughly parallel to the rivers.

- Commencing from the rajpipla hills in the west, through the mahadev hills to the Maikala range, it stretches for a distance of about 900kms.
- Dhupgarh (1350 m) near pachmarhi on Mahadev hills is the highest peak.
- The other peaks are Astamba Dongar (1325 m) and Amarkantak (1127 m).
- Guru Shikhar is highest peak in Aravalli range.