

60 DAY RAPID REVISION (RARE) SERIES

UPSC/IAS Prelims 2022

Test Compilation

Week 5 & 6

Geography



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Q.1) Consider the following statements regarding distribution of Water on Earth's surface:

1. The amount of Freshwater on the earth's surface is only 5 %
2. The percentage of water present in Streams and Rivers is more than Lakes.
3. The percentage of water present in the Atmosphere is more than Soil Moisture

Which of the following statements is/are correct ?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) None of the above

Q.1) Solution: (d)

Basic Info:

About 71% of our earth is covered by water. Out of which 97% of the earth's water is found in the oceans. 3% of the earth's water is fresh.

Distribution of Water in %

- Ocean = 97.25
- Ice caps and glaciers= 2.05
- Groundwater = 0.68
- Lakes = 0.01
- Soil Moisture = 0.005
- Atmosphere = 0.001
- Streams and Rivers = 0.0001
- Biosphere = 0.00004

Q.2) Which of the following is/ are reasons for the formation of Continental Shelves:

1. Relative rise in sea level
2. Submergence of a part of a continent
3. Sedimentary deposits brought down by rivers

Select from the codes given below:

- a) 1, 2 and 3
- b) 2 and 3 only

- c) 1 and 3 only
- d) 1 and 2 only

Q.2) Solution: (a)**Basic Info:**

The continental shelf is the extended margin of each continent occupied by relatively shallow seas and gulfs. It is the shallowest part of the ocean showing an average gradient of 1° or even less. The shelf typically ends at a very steep slope, called the shelf break.

The shelf is formed mainly due to

- Relative rise in sea level
- Submergence of a part of a continent
- Sedimentary deposits brought down by rivers

The width of the continental shelves vary from one ocean to another. The average width of continental shelves is about 80 km. These shelves are almost absent or very narrow along some of the margins like the coasts of Chile, the west coast of Sumatra, etc. On the contrary, the Siberian shelf in the Arctic Ocean, the largest in the world, stretches to 1,500 km in width.

The depth of the shelves also varies. It may be as shallow as 30 m in some areas while in some areas it is as deep as 600 m.

The continental shelves are covered with variable thicknesses of sediments brought down by rivers, glaciers, wind, from the land and distributed by waves and currents. Massive sedimentary deposits received over a long time by the continental shelves, become the source of fossil fuels.

Q.3) Consider the following statements with respect to the Ocean deposits:

1. Pelagic deposits are found on the continental shelves and slopes.
2. Terrigenous deposits are found over deep sea plains.

Which of the following statements is/are correct ?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

d) Neither 1 nor 2

Q.3) Solution: (d)

Basic Info:

John Murray has classified ocean deposits into two broad categories based on the settlement locations.

1. The terrigenous deposits: These are found on the continental shelves and slopes and mainly consist of the rock material derived because of wear and tear.

2. The pelagic deposits: These are found over deep sea plains. These deposits mainly consist of organic remains of plants and animals.

1. Terrigenous Deposits:

- Terrigenous deposits are derived from the wear and tear of land and volcanic and organic products found majorly in the continental slope and shelf areas.

- On the basis of size of particles, the terrigenous deposits may be categorised into three classes— mud, sand and gravel.

2. Pelagic deposits:

-Pelagic deposits comprise 75% of the total sea floor. They consist of both organic and inorganic materials.

- Organic materials are in the form of a kind of liquid mud, called ooze, which contains shells and skeletons of various marine organisms.

- The ooze is said to be calcareous when the shell is made of calcium carbonate.

-Inorganic materials are in the form of red clay of volcanic origin.

-The chief constituents of red clay are silicon and aluminium dioxide, while other constituents include iron, manganese, phosphorus and radium. The red clay is the most widely spread pelagic deposit and covers 38% of the sea floor.

Q.4) Which of the following statement is most appropriate regarding Geysers and Hot Springs?

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

- b) Geysers spout hot water continuously while hot springs spout water intermittently.
- c) Geysers spout hot water without any explosion while Hot springs spout hot water explosively.
- d) Geysers spout hot water explosively while hot springs spout hot water without any explosion.

Q.4) Solution: (d)

Basic Info:

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.5) Consider the following statements regarding Estuaries:

1. Estuaries form a transition zone between river environments and maritime environments known as ecotone.
2. Estuaries are subject both to marine influences and riverine influences.

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.5) Solution: (c)**Basic Info:****Estuaries:**

-An estuary is a partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it and with a free connection to the open sea.

Estuaries are formed due to rise in sea level, movement of sand and sandbars, glacial processes and tectonic processes.

Estuaries form a transition zone between river environments and maritime environments known as ecotone.

Estuaries are subject both to marine influences such as tides, waves, and the influx of saline water and to riverine influences such as flows of freshwater and sediment.

The mixing of seawater and freshwater provides high levels of nutrients both in the water column and in sediment making estuaries among the most productive natural habitats in the world.

Examples of estuaries are river mouths, coastal bays, tidal marshes, lagoons and deltas.

Q.6) Consider the following pairs:**Ocean Current****Adjacent Coast**

- | | |
|-----------------------|--------------------------------|
| 1. Agulhas Current : | Eastern coast of Africa |
| 2. Irminger Current : | Coast of Alaska |
| 3. Humboldt Current : | Western coast of South America |

Which of the following pairs are correctly matched ?

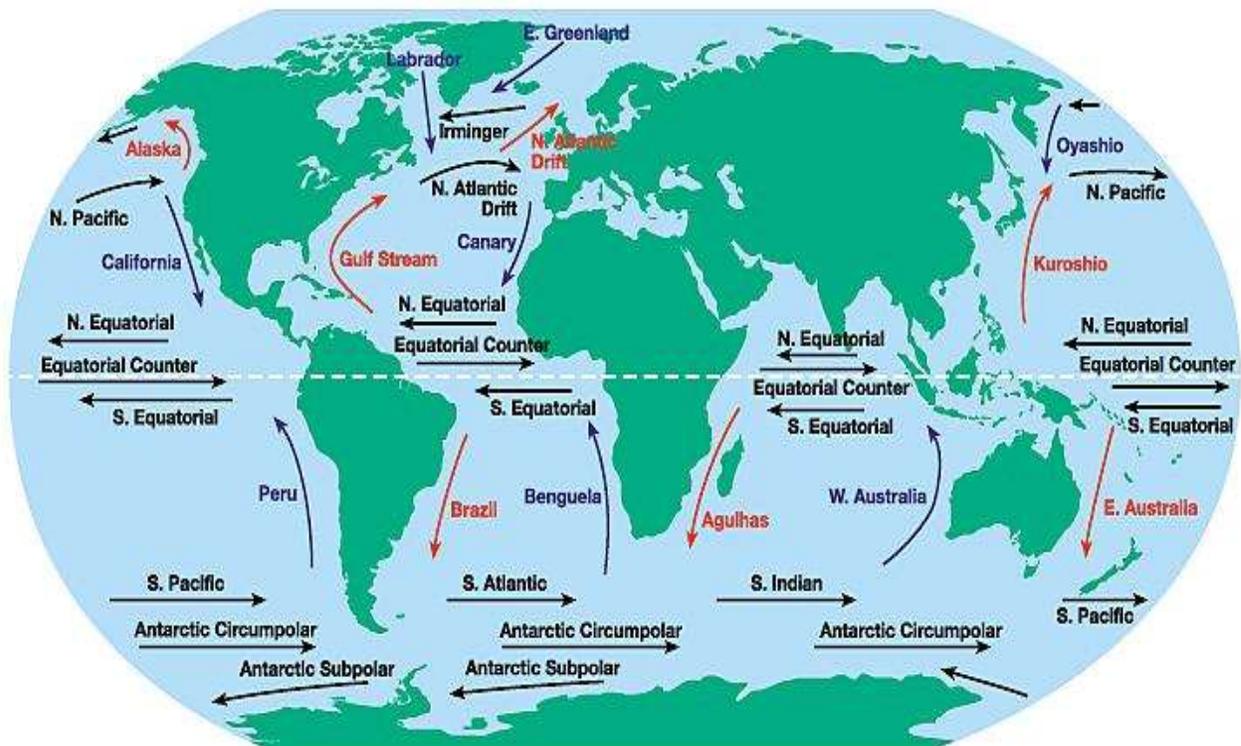
- a) 1 and 3 only
- b) 2 and 3 only
- c) 1 and 2 only
- d) 1, 2 and 3

Q.6) Solution: (a)**Basic Info:**

-The Agulhas Current is the western boundary current of the South-West Indian Ocean. It flows down the east coast of Africa. The source water at its northern end is derived from Mozambique channel eddies and the East Madagascar Current, but the greatest source of water is recirculation in the southwest Indian Ocean sub-gyre. Hence pair 1 is correctly matched.

-The Irminger Current is a north Atlantic ocean current setting westward off the southwest coast of Iceland. It is composed of relatively warm and saline waters from the eastern North Atlantic that are fed by the North Atlantic Drift. The Irminger Current is part of the North Atlantic subpolar gyre. Hence pair 2 is not correctly matched.

-The Humboldt Current, also called the Peru Current, is a cold, low-salinity ocean current that flows north along the western coast of South America. Hence pair 3 is correctly matched.



Q.7) Arrange the following sections of the ocean relief as they occur from the coast to the deep sea.

1. Continental Slope
2. Continental Rise
3. Abyssal plain
4. Continental Shelf

Select the correct answer using the code given below.

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

Q.7) Solution: (b)

Basic Info: -The ocean floors can be divided into four major divisions: (i) the Continental Shelf; (ii) the Continental Slope; (iii) the Deep Sea Plain; (iv) the Oceanic Deeps.

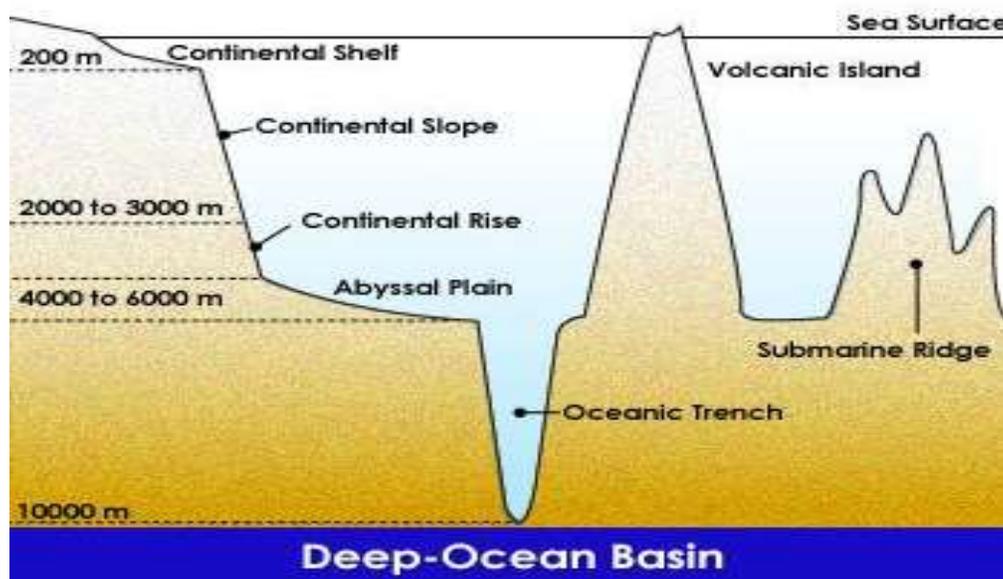
-Besides, these divisions there are also major and minor relief features in the ocean floors like ridges, hills, sea mounts, guyots, trenches, canyons, etc.

Continental Shelf: The continental shelf is the extended margin of each continent occupied by relatively shallow seas and gulfs. It is the shallowest part of the ocean showing an average gradient of 1° or even less.

Continental Slope: The continental slope connects the continental shelf and the ocean basins. It begins where the bottom of the continental shelf sharply drops off into a steep slope.

Continental Rise: The continental rise is found between the continental slope and the abyssal plain. It represents the final stage in the boundary between continents and the deepest part of the ocean. At the bottom of the continental slope, one will find the continental rise, an underwater hill composed of tons of accumulated sediments.

Abyssal Plain: The abyssal plain is an underwater plain on the deep ocean floor, usually found at depths between 4,000 metres and 6,000 metres. It lies between the foot of a continental rise and a mid-ocean ridge.



Q.8) With reference to Artesian basin, consider the following statements:

1. An artesian basin is a low-lying region where groundwater is cramped under pressure from surrounding layers of rock.
2. These basins are usually found where an aquifer is present in a syncline.
3. The Great Artesian Basin is one of the largest underground water reservoirs in the world.

Which of the following statements is/are correct ?

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

Q.8) Solution: (d)

Basic Info:

An artesian basin is a low-lying region where groundwater is cramped under pressure from surrounding layers of rock. These basins are usually found where an aquifer is present in a syncline, by impenetrable layers above as well as below.

Whenever a fissure breaks the surface, the underground water blow up. This results in the rising of the water level to a point where hydrostatic equilibrium has been achieved.

The Great Artesian Basin is one of the largest underground water reservoirs in the world. It underlies approximately 22 per cent of Australia, occupying an area of over 1.7 million square kilometres beneath the arid and semi-arid parts of Queensland, New South Wales, South Australia and the Northern Territory.

Q.9) Consider the following statements:

1. Atlantic Meridional Overturning Circulation (AMOC) carries warm surface waters from the tropics towards the Northern Hemisphere, where it cools and sinks.
2. Antarctic Circumpolar Current is the only current that flows completely around the globe.

Which of the following statements is/are correct ?

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

Q.9) Solution: (c)

Basic Info:

According to the recently released IPCC's Report, Atlantic Meridional Overturning Circulation (AMOC) is losing its stability and is very likely to decline over the 21st century.

About AMOC:

It is a large system of ocean currents.

It is the Atlantic branch of the ocean conveyor belt or ThermoHaline Circulation (THC), and distributes heat and nutrients throughout the world's ocean basins.

Working of AMOC:

AMOC carries warm surface waters from the tropics towards the Northern Hemisphere, where it cools and sinks.

It then returns to the tropics and then to the South Atlantic as a bottom current. From there it is distributed to all ocean basins via the Antarctic Circumpolar Current.

The ACC is the most important current in the Southern Ocean, and the only current that flows completely around the globe.

Implications of decline of AMOC:

Without a proper AMOC and Gulf Stream, Europe will be very cold.

Gulf Stream, a part of the AMOC, is a warm current responsible for mild climate at the Eastern coast of North America as well as Europe.

An AMOC shutdown would cool the northern hemisphere and decrease rainfall over Europe.

It can also have an effect on the El Nino.

Q.10) “Glacial Lake Atlas of Ganga Basin” was released by which of the following?

- a) Central Water Commission
- b) National Ganga River Basin Authority (NGRBA)
- c) Department of Water Resources, River Development & Ganga Rejuvenation
- d) Ministry of Environment, Forest and Climate Change (MoEFCC)

Q.10) Solution:(c)

Basic Info:

The Department of Water Resources, River Development, and Ganga Rejuvenation (DoWR, RD & GR) released the Glacial Lake Atlas of Ganga Basin.

About the Glacial Lake Atlas:

- The present glacial lake atlas is based on the inventoried glacial lakes in part of Ganga River basin from its origin to foothills of Himalayas covering a catchment area of 2,47,109 sq. km.
- Glacial Lake Atlas is to Be Used In Carrying Out Climate Change Impact Analysis And Disaster Mitigation Planning
- The study portion of Ganga River basin covers part of India and transboundary region.
- The Ganga River Basin Atlas is brought out under the National Hydrology Project (NHP).
- The atlas is prepared with the efforts of the National Remote Sensing Centre (NRSC), ISRO under the National Hydrology Project (NHP).

Q.11) Consider the following statements:

1. Fukutoku-Okanoba is submarine volcano situated near Japan
2. Submarine volcanoes are located mainly near Mid-Oceanic Ridges

Which of the following statements is/are correct ?

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

Q.11) Solution: (c)**Basic Info:****About Fukutoku-Okanoba volcano:**

- In Sept 2021, Fukutoku-Okanoba Submarine Volcano exploded in the Pacific Ocean, off Japan that may poses a risk to the passage of planes and ships.
- The Fukutoku-Okanoba volcano is situated about 25 metres (80 feet) below the sea five kilometres north of Japan's South Iwo Jima Island.
- The plume reached a height of 16 kilometres above the surface, posing a risk to the passage of planes and ships.

Submarine volcanoes:

- Submarine volcanoes are erupting basaltic lavas and new crust material is actively formed with substantial piles of pillow lavas.
- Submarine volcanoes are underwater vents or fissures in the Earth's surface from which magma can erupt.
- **Many submarine volcanoes are located near areas of tectonic plate formation, known as mid-ocean ridges.**
- The volcanoes at mid-ocean ridges alone are estimated to account for 75% of the magma output on Earth.

Q.12) Coral reef is a peculiar type of marine landform. In this context, consider the following statements:

1. Corals thrive only in the tropical and sub-tropical regions.
2. Depth of water is an important factor in reef formation.

3. Corals are best developed on seaward side of the reef.

Which of the following statements is/are incorrect ?

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

Q.12) Solution: (b)

Basic info:

Coral Reefs:

As a rule, **corals thrive well only in the warmer tropical seas**. But there are deep water corals also that are found in deeper and darker parts of the ocean where temperatures may be as cold as 4 degrees Celsius.

-In tropical seas, many kinds of coral animals and marine organisms such as coral polyps, calcareous algae, shell-forming creatures and lime-secreting plants live in large colonies.

-Though they are very tiny creatures, their ability to secrete calcium carbonate within their tiny cells has given rise to a peculiar type of marine landform. Each polyp resides in a tiny cup of coral and helps to form coral reefs.

-When they die, their limy skeletons are cemented into coralline limestone.

Conditions for reef formation

The reef-building corals survive best under the following conditions:

The water temperature must not fall below 68°F (20°C):

-This limits the areal distribution of corals to the tropical and sub-tropical zones.

-Again they will not flourish where there are cold currents because of the upwelling of the cold water from the depths that cools the warm surface water. This explains why coral reefs are generally absent on the western coasts of continents.

-On the other hand, the warming effect of the warm currents, e.g. the Gulf Stream, means that corals are found far to the north of the West Indies in the Atlantic Ocean. The Pacific and the Indian Oceans, however, have the most numerous coral reefs.

-There are also non-reef-building species of corals such as the 'precious corals' of the Pacific Ocean and the 'red coral' of the Mediterranean which may survive in the colder and even the deeper waters.

The depth of the water should not exceed 30 fathoms or 180 feet:

-Beyond this depth sunlight is too faint for photosynthesis to take place. This is essential for the survival of the microscopic algae, on which the coral polyps depend. Shallow water of less than 100 feet is ideal. But there should always be plenty of water as polyps cannot survive for too long out of water.

The water should be salty and free from sediment:

-Corals therefore survive best in the moving ocean water well away from the silty coasts or muddy mouths of streams.

-**The corals are best developed on the seaward side of the reef**, where constantly moving waves, tides and currents maintain an abundant supply of clear, oxygenated water. They also bring an adequate supply of food in the form of microscopic organisms.

Q.13) Which of the following are the primary forces that initiate the movement of ocean currents?

1. Wind
2. Gravity
3. Coriolis force
4. Heating by solar energy

Select from the codes given below:

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

Q.13) Solution: (c)

Basic info:

-Ocean currents are like river flow in oceans. They represent a regular volume of water in a definite path and direction.

-Ocean currents are influenced by two types of forces namely :

- (i) Primary forces that initiate the movement of water;
- (ii) Secondary forces that influence the currents to flow.

The primary forces that influence the currents are:

- wind
- gravity
- coriolis force
- heating by solar energy

-Heating by solar energy causes the water to expand. That is why, near the equator the ocean water is about 8 cm higher in level than in the middle latitudes. This causes a very slight gradient and water tends to flow down the slope.

- Wind blowing on the surface of the ocean pushes the water to move. Friction between the wind and the water surface affects the movement of the water body in its course.

- Gravity tends to pull the water down the pile and create gradient variation.

- The Coriolis force intervenes and causes the water to move to the right in the northern hemisphere and to the left in the southern hemisphere.

Q.14) Consider the following statements regarding the landforms created by Ground Water?

1. Karst topography in Balkan developed by groundwater through the process of deposition.
2. Physical or mechanical removal of materials by moving groundwater is significant in developing landforms.

Select from the codes given below:

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

Q.14) Solution: (a)

Basic Info:

Ground Water:

Any limestone or dolomitic region showing typical landforms produced by the action of groundwater through the processes of solution and deposition is called Karst topography after

the typical topography developed in limestone rocks of Karst region in the Balkans adjacent to Adriatic sea.

It is this downward and horizontal movement of water that causes the rock to erode. **Physical or mechanical removal of materials by moving groundwater is insignificant in developing landforms.**

The karst topography is also characterised by erosional and depositional landforms.

- Erosional Landforms: pools, sinkholes, lapies and caves.
- Depositional Landforms: stalactites, stalagmites and pillars.

Q.15) With regard to Ocean currents, consider the following statements:

1. In the South Pacific Ocean, the South Equatorial Current flows towards the west and turns southward as the East Australian Current.
2. The cold waters of the Peru Current are partially responsible for scanty rainfall on the coast of the northern Chile and western Peru.
3. The general pattern of circulation in the southern hemisphere of the Indian Ocean is anticlockwise as that of the other oceans.

Select from the codes given below:

- a) 3 only
- b) 1, 2 and 3
- c) None of the above
- d) 1 and 3 only

Q.15) Solution: (b)

Basic Info:

In the South Pacific Ocean, the South Equatorial Current flows towards the west and turns southward as the East Australian Current.

From Tasmania, it flows as the cold South Pacific Current from west to east and crosses the Pacific Ocean along with the West Wind Drift.

On reaching the south-western coast of South America, it turns northward and flows as the cold Peru Current or Humbolt Current.

The cold waters of the Peru Current are partially responsible for making the coast of the northern Chile and western Peru with very scanty rainfall.

Peru Current eventually joins with the South Equatorial Current and completes the circuit.

The pattern of circulation of ocean currents in the Indian Ocean differs from the general pattern of circulation in the Atlantic and the Pacific Oceans. This is because the Indian Ocean is blocked by the continental masses in the north.

The general pattern of circulation in the southern hemisphere of the Indian Ocean is anticlockwise as that of the other oceans.

In the northern hemisphere, there is a clear reversal of currents in the winter and summer seasons, which are completely under the influence of the seasonal changes of monsoon winds.

Q.16) Consider the following statements regarding low sedimentary coasts:

1. Along low sedimentary coasts, the rivers appear to extend their length by building coastal plains and deltas.
2. The coastline appears smooth with occasional incursions of water in the form of lagoons and tidal creeks

Which of the following 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 Info

Low Sedimentary Coasts:

- Along low sedimentary coasts, the rivers appear to extend their length by building coastal plains and deltas.
- The coastline appears smooth with occasional incursions of water in the form of lagoons and tidal creeks. The land slopes gently into the water.
- Marshes and swamps may abound along the coasts. Depositional features dominate.

Q.17) Consider the following statements regarding Vertical Distribution of Salinity:

1. Salinity at the surface varies, where as salinity at depth is fixed.
2. The higher salinity water rests above the lower salinity dense water.

Which of the following statements is/are correct ?

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

Q.17) Solution: (a)**Basic Info****Vertical Distribution of Salinity:**

Salinity at the surface increases by the loss of water to ice or evaporation, or decreased by the input of fresh waters, such as from the rivers. Therefore at the surface salinity varies.

Salinity at depth is very much fixed, because there is no way that water is 'lost', or the salt is 'added.'

There is a marked difference in the salinity between the surface zones and the deep zones of the oceans.

The lower salinity water rests above the higher salinity dense water.

Salinity, generally, increases with depth and there is a distinct zone called the halocline, where salinity increases sharply.

Other factors being constant, increasing salinity of seawater causes its density to increase.

High salinity seawater, generally, sinks below the lower salinity water. This leads to stratification by salinity.

Q.18) With reference to Warm and Cold currents, consider the following statements:

1. Cold currents are usually found on the west coast of the continents in the low and middle latitudes.
2. Warm current are found on the east coasts of continents in high latitudes.

Which of the following statements is/are correct ?

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

Q.18) Solution: (a)

Basic Info

Ocean currents can also be classified based on temperature as cold currents and warm currents:

Cold currents bring cold water into warm water areas. These currents are usually found on the west coast of the continents in the low and middle latitudes (true in both hemispheres) and on the east coast in the higher latitudes in the Northern Hemisphere

Warm currents bring warm water into cold water areas and are usually observed on the east coast of continents in the low and middle latitudes (true in both hemispheres). **In the northern hemisphere they are found on the west coasts of continents in high latitudes.**

Q.19) Consider the following statements regarding glaciers:

1. The Pensilungpa Glacier is located in Zaskar, Ladakh.
2. The South Col glacier is the highest glacier in the world.

Which of the following statements is/are correct ?

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

Q.19) Solution: (c)

Basic Info:

The Pensilungpa Glacier is located in Zaskar, Ladakh. It is retreating due to an increase in the temperature and decrease in precipitation during winters.

South Col Glacier: The South Col is a sharp-edged col between Mount Everest and Lhotse, the highest and fourth-highest mountains in the world, respectively. (Two cirques is called a col)

At a mean elevation of 7,985 mean sea level, this glacier is the highest glacier in the world.

Recent studies have found that SCG has lost more than 54m of thickness in the last 25 years.

Q.20) Consider the following statements regarding tides:

1. Movement of water caused by meteorological effects are called surges.
2. The tide-generating force is the difference between the gravitational attraction of the moon and the centrifugal force.
3. On the surface of the earth, the horizontal tide generating forces are more important than the vertical forces in generating the tidal bulges

Which of the following statements is/are correct ?

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

Q.20) Solution: (c)

Basic Info:

The periodical rise and fall of the sea level, once or twice a day, mainly due to the attraction of the sun and the moon, is called a tide.

Movement of water caused by meteorological effects (winds and atmospheric pressure changes) are called surges. Surges are not regular like tides.

Causes for occurrences of tides:

- The moon's gravitational pull
- The sun's gravitational pull,
- Another factor is centrifugal force, which is the force that acts to counter balance the gravity.

Together, the gravitational pull and the centrifugal force are responsible for creating the two major tidal bulges on the earth.

The ‘tide-generating’ force is the difference between these two forces; i.e. the gravitational attraction of the moon and the centrifugal force.

On the surface of the earth, nearest the moon, pull or the attractive force of the moon is greater than the centrifugal force, and so there is a net force causing a bulge towards the moon.

On the opposite side of the earth, the attractive force is less, as it is farther away from the moon, the centrifugal force is dominant. Hence, there is a net force away from the moon. It creates the second bulge away from the moon.

On the surface of the earth, the horizontal tide generating forces are more important than the vertical forces in generating the tidal bulges.

Q.21) With reference to Alluvial soils in India, consider the following statements:

1. These soils constitute more than 50% of the total area of the country.
2. They typically swell and become sticky when wet and shrink when dried.
3. They are generally rich in potash and phosphorus.

Which of the following statements is/are correct ?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) None of the above

Q.21) Solution: (d)

Basic Info:

- Alluvial soils are widespread in the northern plains and the river valleys. **These soils cover about 40 per cent of the total area of the country.**

- They are depositional soils, transported and deposited by rivers and streams. Through a narrow corridor in Rajasthan, they extend into the plains of Gujarat. In the Peninsular region, they are found in deltas of the east coast and in the river valleys.

- The alluvial soils vary in nature from sandy loam to clay. **They are generally rich in potash but poor in phosphorous.**

- The colour of the alluvial soils varies from the light grey to ash grey. Its shades depend on the depth of the deposition, the texture of the materials, and the time taken for attaining maturity. Alluvial soils are intensively cultivated.

- **Black soil, not alluvial soil, swell and become sticky when wet and shrink when dried.**

Q.22) Consider the following statements regarding Regur Soil:

1. These are found mostly in the states of Maharashtra, MadhyaPradesh, Gujarat, Andhra Pradesh.
2. These are generally clayey, deep and impermeable.

Which of the following statements is/are correct ?

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

Q.22) Solution: (c)

Basic Info:

Black soils are also also known as the 'Regur Soil' or the 'Black Cotton Soil'.

Black soil covers most of the Deccan Plateau which includes parts of Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh and some parts of Tamil Nadu. In the upper reaches of the Godavari and the Krishna, and the north western part of the Deccan Plateau, the black soil is very deep.

These are generally clayey, deep and impermeable. They swell and become sticky when wet and shrink when dried. So, during the dry season, these soil develop wide cracks. Thus, there occurs a kind of 'self ploughing'.

Because of this character of slow absorption and loss of moisture, the black soil retains the moisture for a very long time, which helps the crops, especially, the rain fed ones, to sustain even during the dry season.

Q.23) Which of the following statements regarding Red soils is/are incorrect ?

1. These soil develops a reddish colour due to a wide diffusion of iron in crystalline and metamorphic rocks.
2. They are rich in nitrogen, phosphorous and humus.
3. These are not suited for the cultivation of cotton and oil seeds.

Select from the codes given below:

- a) 1 and 3 only
- b) 2 and 3 only
- c) 1 and 2 only
- d) None of the above

Q.23) Solution: (b)

Basic Info:

Red soil develops on crystalline igneous rocks in areas of low rainfall in the eastern and southern part of the Deccan Plateau. Along the piedmont zone of the Western Ghat, long stretch of area is occupied by red loamy soil.

Yellow and red soils are also found in parts of Odisha and Chattisgarh and in the southern parts of the middle Ganga plain.

The soil develops a reddish colour due to a wide diffusion of iron in crystalline and metamorphic rocks. It looks yellow when it occurs in a hydrated form.

The fine-grained red and yellow soils are normally fertile, whereas coarse-grained soils found in dry upland areas are poor in fertility.

This soil is deficient in nitrogen, humus, phosphoric acid, magnesium, and lime but fairly rich in potash, with its pH ranging from neutral to acidic.

Proper use of fertilizers and irrigation yields high production of cotton, wheat, rice, pulses, millets, tobacco, oil seeds, potatoes, and fruits.

Q.24) Consider the following statements about a soil group in India:

1. This soil is a result of intense leaching due to tropical rains.
2. These are generally not suitable for cultivation but mostly favoured in the building construction materials.

The above features best describes which of the following soil groups in India ?

- a) Red Soil
- b) Laterite Soil
- c) Black Soil
- d) Alluvial Soil

Q.24) Solution: (b)

Basic Info:

Laterite soils are formed under the conditions of high temperature and heavy rainfall with alternate wet and dry periods. **These are the result of intense leaching due to tropical rains.** Due to intensive leaching and low base exchange capacity, the laterite soils generally lack fertility.

They are mainly found on the summits of western ghats, eastern ghats and rajmahal hills.

These soils are poor in organicmatter, nitrogen, phosphate and calcium,while iron oxide and potash are in excess.Hence, laterites are not suitable for cultivation.

Laterite soils are most favoured in the building construction materials. These soils can be easily cut with a spade and don't weather much. Hence, indefinitely durable.

Q.25) The terms Urvara and Usara refers to ?

- a) Forms of Puppetry from Western India
- b) Soil Classification from Ancient India
- c) Ethnic groups of North Eastern India
- d) Art forms from Southern India

Q.25) Solution: (b)

Basic Info:

Soil is the mixture of rock debris and organic materials which develop on the earth's surface. In ancient times, soils used to be classified into two main groups – Urvara and Usara, which were fertile and sterile, respectively.

Q.26) With reference to the Tropical Thorn Forests, consider the following statements:

1. These forests are found only in Punjab, Haryana, and Rajasthan.
2. In these forests, plants remain leafless for the most part of the year and give an expression of scrub vegetation.

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.26) Solution: (b)

Basic Info:

Tropical Thorn Forests:

Tropical thorn forests occur in the areas which receive rainfall less than 50 cm. These consist of a variety of grasses and shrubs.

It includes semi-arid areas of southwest Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh, and Uttar Pradesh.

In these forests, plants remain leafless for the most part of the year and give an expression of scrub vegetation. Important species found are babool, ber, and wild date palm, khair, neem, khejri, palas, etc. Tussocky grass grows upto a height of 2 m as the undergrowth.

Q.27) Consider the following statements regarding Southern Mountain Forests in India:

1. These types of forests are predominantly found in three distinct areas of Peninsular India.
2. Trees of economic significance include magnolia, laurel, cinchona, and wattle.
3. The temperate forests of Palani Hills are called Sholas.

Which of the above statements is/are correct ?

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

Q.27) Solution: (b)**Basic Info:**

Southern Mountain Forests:

The southern mountain forests include the forests found in three distinct areas of Peninsular India viz; the Western Ghats, the Vindhyas and the Nilgiris.

As they are closer to the tropics, and only 1,500 m above the sea level, vegetation is temperate in the higher regions, and subtropical on the lower regions of the Western Ghats, especially in Kerala, Tamil Nadu, and Karnataka.

The temperate forests are called Sholas in the Nilgiris, Anaimalai and Palani hills.

Some of the other trees of this forest of economic significance include magnolia, laurel, cinchona, and wattle.

Such forests are also found in the Satpura and the Maikal ranges.

Q.28) Consider the following statements regarding Arid Soils:

1. Presence of Kankar layers are found in the lower horizon of the soils.
2. They are generally sandy in structure and saline in nature.
3. These soils are characteristically developed in western Rajasthan.

Which of the above statements is/are correct ?

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

Q.28) Solution: (a)**Basic Info:**

Arid soils range from red to brown in colour. **They are generally sandy in structure and saline in nature.** In some areas, the salt content is so high that common salt is obtained by evaporating the saline water.

Due to the dry climate, high temperature and accelerated evaporation, they lack moisture and humus. Nitrogen is insufficient and the phosphate content is normal.

Lower horizons of the soil are occupied by ‘kankar’ layers because of the increasing calcium content downwards. The ‘Kankar’ layer formation in the bottom horizons restricts the infiltration of water, and as such when irrigation is made available, the soil moisture is readily available for a sustainable plant growth.

Arid soils are characteristically developed in western Rajasthan, which exhibit characteristic arid topography.

Q.29) Consider the following pairs regarding types of erosion:

1. Sheet erosion: It is caused by detachment and transportation of soil particles by flowing rainwater.
2. Rill erosion: It happens when runoff concentrates and flows strongly enough to detach and move soil particles.
3. Gully erosion: It occurs when runoff water forms small channels as it concentrates down a slope.

Which of the above pairs is correctly matched ?

- a) 1 only
- b) 2 only
- c) 3 only
- d) None of the above

Q.29) Solution: (a)

Basic Info:

Erosion is the geological process in which earthen materials are worn away and transported by natural forces such as wind or water.

Few types of erosion:

Sheet erosion: The detachment and transportation of soil particles by flowing rainwater is called sheet or wash off erosion. This is a very slow process and often remain unnoticed.

Rill erosion: In rill erosion finger like rills appear on the cultivated land after it has undergone sheet erosion. These rills are usually smoothed out every year while forming. Each year the rills slowly increase in number become wider and deeper.

Rill erosion occurs when runoff water forms small channels as it concentrates down a slope.

Gully erosion: Gully erosion happens when runoff concentrates and flows strongly enough to detach and move soil particles.

Q.30) Which of the following can be considered as the factors causing Salinization ?

1. Rise in sea level
2. Drought
3. Usage of poor quality groundwater for irrigation
4. Improper usage of fertilizers and pesticide

Select from the codes given below:

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

Q.30) Solution: (c)

Basic Info:

Salinization is the increase of salt concentration in soil and is, in most cases, caused by dissolved salts in the water supply.

Factors such as sea level rise, drought, usage of poor quality groundwater for irrigation and improper usage of fertilizers and pesticide has led to the soil becoming salt-affected.

Due to climate change, sea levels are rising, which further accelerates the process of salinization.

Q.31) Consider the following statements:

1. Forest area is the area notified and recorded as the forest land irrespective of the existence of trees.
2. Forest cover is based on the records of the State Revenue Department.

Which of the following statements is/are correct ?

- a) 1 only
- b) 2 only

- c) Both 1 and 2
- d) Neither 1 nor 2

Q.31) Solution: (a)**Basic Info:**

The forest area is the area notified and recorded as the forest land irrespective of the existence of trees, while the actual forest cover is the area occupied by forests with canopy.

The forest area is based on the records of the State Revenue Department, while forest cover is based on aerial photographs and satellite imageries.

Both forest area and forest covers vary from state to state.

Q.32) Consider the following statements regarding Mangrove Forests:

1. They grow along the coasts in the salt marshes, tidal creeks and estuaries.
2. They are highly developed in the Andaman and Nicobar Islands.
3. India holds around 10 percent of the world's mangrove forests.

Which of the following statements is/are correct ?

- a) 2 and 3 only
- b) None of the above
- c) 1, 2 and 3
- d) 1 and 2 only

Q.32) Solution: (d)**Basic Info:**

Mangroves grow along the coasts in the salt marshes, tidal creeks, mudflats and estuaries.

They consist of a number of salt tolerant species of plants. Crisscrossed by creeks of stagnant water and tidal flows, these forests give shelter to a wide variety of birds.

In India, the mangrove forests spread over 6,740 sq. km which is 7 percent of the world's mangrove forests.

They are highly developed in the Andaman and Nicobar Islands and the Sunderbans of West Bengal. Other areas of significance are the Mahanadi, the Godavari, and the Krishn deltas.

Q.33) Consider the following statements regarding Monsoon Forests in India:

1. These are the most widespread forests in India.
2. They are spread over regions which receive rainfall between 70-200 cm.
3. This forest is of great commercial value to India due to the large availability of Teak, Sandalwood, Lac resin, medicinal values.

Which of the following statements is/are correct ?

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

Q.33) Solution: (c)

Basic Info:

These are the most widespread forests in India. They are also called the monsoon forests. **They spread over regions which receive rainfall between 70-200 cm.**

On the basis of the availability of water, these forests are further divided into moist and dry deciduous.

The Moist deciduous forests are more pronounced in the regions which record rainfall between 100-200 cm. These forests are found in the northeastern states along the foothills of Himalayas, eastern slopes of the Western Ghats and Odisha.

Teak, sal, shisham, hurra, mahua, amla, semul, kusum, and sandalwood etc. are the main species of these forests.

Dry deciduous forest covers vast areas of the country, where rainfall ranges between 70 -100 cm. On the wetter margins, it has a transition to the moist deciduous, while on the drier margins to thorn forests.

These forests are found in rainier areas of the Peninsula and the plains of Uttar Pradesh and Bihar.

As the dry season begins, the trees shed their leaves completely and the forest appears like a vast grassland with naked trees all around. Tendu, palas, amaltas, bel, khair, axlewood, etc. are the common trees of these forests. In the western and southern part of Rajasthan, vegetation cover is very scanty due to low rainfall and overgrazing.

Q.34) The statements given below are characteristics of which of the following forests ?

1. These forests are wellstratified, with layers closer to the ground and are covered with shrubs and creepers.
2. They are found in warm and humid areas with annual precipitation of over 200 cm.
3. These forests appear green all the year-round.

Select the correct option from the codes given below:

- a) Tropical Evergreen Forests
- b) Dry Deciduous Forests
- c) Temperate Forests
- d) Tropical Deciduous Forests

Q.34) Solution: (a)

Basic Info:

Tropical Evergreen Forest

These forests are found in the western slope of the Western Ghats, hills of the north-eastern region and the Andaman and Nicobar Islands. They are found in warm and humid areas with annual precipitation of over 200 cm and mean annual temperature above 22 degree Celsius.

Tropical evergreen forests are wellstratified, with layers closer to the ground and are covered with shrubs and creepers, with short structured trees followed by a tall variety of trees

In these forests, trees reach great heights upto 60 m or above. There is no definite time for trees to shed their leaves, flowering, and fruiting. As such these forests appear green all the year-round. Species found in these forests include rosewood, mahogany, ebony, etc.

Q.35) Consider the following statements:

1. The world's biggest coal mine is in the United States.
2. China is the second-largest consumer of coal after the United States.

Which of the following statements is/are correct ?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

d) Neither 1 nor 2

Q.35) Solution: (a)

Basic Info:

North Antelope Rochelle coal mine in the Powder River Basin of Wyoming, USA, is the largest coal mine in the world.

China is the largest consumer of coal, and has comprised more than half of global consumption since 2011, with this share growing year upon year reaching 56% in 2020.

Q.36) Consider the following statements regarding Coal reserves in India:

1. Gondwana Coalfields make up to 98 percent of the total reserves in India.
2. Anthracite coal reserve is found only North East India.
3. Jharkhand produces more than 90% of India's Coking coal.

Which of the following statements is/are correct ?

- a) 1 and 3 only
- b) 1 and 2 only
- c) 2 and 3 only
- d) None of the above

Q.36) Solution: (a)

Basic Info:

Coal reserves in India

Most of the world's coal was formed in Carboniferous age (350 million years ago). It is the best quality of coal reserves, but India does not have this type of coalfields.

Gondwana Coalfields were formed nearly 250 million years ago. They make up to 98 percent of the total reserves and 99 percent of the production of coal in India.

Tertiary coal is 15 to 60 million years old hence, its carbon content is very low. Mainly confined to the extra-Peninsula, the important areas of Tertiary coal include parts of Assam, Meghalaya, Arunachal Pradesh, Nagaland, Himalayan foothills of Darjeeling in West Bengal, Jammu and Kashmir, Uttar Pradesh, Rajasthan, Kerala, Tamil Nadu, and Puducherry.

On the basis of carbon content, Coal is of 4 types viz. Anthracite(80-95% C), Bituminous (60-80% C), Lignite (40-55% C), and Peat (less than 40% C).

Anthracite coal is very rare in India. Only Jammu & Kashmir has this type of coal reserves.

On the basis of metallurgical uses, Coal is of two types viz. Coking coal and non-Coking coal. **Jharkhand produces more than 90% of India's Coking coal.**

Q.37) Shale gas is found in which of the following region ?

1. Gangetic plain
2. Assam-Arakan Basin
3. Rajasthan
4. Andhra Pradesh

Select from the codes given below:

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

Q.37) Solution: (b)

Basic Info:

Shale Gas reserves in India:

Oil Shales are usually fine-grained sedimentary rocks containing relatively large amounts of organic matter from which significant quantities of shale oil and combustible gas can be extracted by destructive distillation.

The Shale Gas Formations are spread over several sedimentary basins, such as Gangetic plain, Gujarat, Rajasthan, Andhra Pradesh and other coastal areas in the country, including hydrocarbon bearing ones— Cambay, Assam-Arakan & Damodar Basins, have large shale deposits.

Q.38) Consider the following statements regarding Gas Hydrates:

1. Gas hydrates are crystalline form of methane and water.

- Gas hydrates sites have been identified and surveyed in the Krishna-Godavari (KG) and the Mahanadi basins.

Which of the following statements is/are correct ?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.38) Solution: (c)

Basic Info:

Natural gas hydrates are a naturally occurring, ice-like combination of natural gas and water. They are mainly found in oceans and Polar Regions.

Gas hydrates are crystalline form of methane and water, and exist in shallow sediments of outer continental margins. They are envisaged as a viable major energy resource for future.

Promising sites of gas hydrates have been identified and surveyed in the Krishna-Godavari (KG) and the Mahanadi basins

Methane gas hydrate is stable at the seafloor at water depths beneath about 500 m.

Known as flammable ice, methane hydrates are molecules of gas contained in an ice matrix found in permafrost regions of the arctic and on the seafloor at continental margins below 500 meters of depth.

Using methane from gas hydrate as an energy resource would be, compared to other hydrocarbons, relatively climate friendly as combustion of methane is twice as efficient as burning coal.

Q.39) Consider the following statements regarding Biogas:

- Biogas primarily consists of methane, carbon dioxide and small amounts of hydrogen sulfide.
- It can be produced by anaerobic digestion using anaerobic organisms.

Which of the following statements is/are correct ?

- 1 only

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

Q.39) Solution: (c)

Basic Info:

Bio-gas

Biogas is a renewable energy source. It refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen.

Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste.

Biogas can be produced by anaerobic digestion with anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials.

Biogas is primarily methane (CH₄) and carbon dioxide (CO₂) and may have small amounts of hydrogen sulfide (H₂S), moisture and siloxanes.

It can be compressed like CNG called BioCNG. Bio-CNG is cheaper and cleaner than conventional diesel. Vehicles can run solely on gas (dedicated), or on both diesel and gas (dual-fuel)

Q.40) Which of the following is/are non-conventional sources of energy?

1. Solar Energy
2. Hydro Energy
3. Nuclear Energy
4. Biomass

Select from the codes given below:

- a) 1, 2, 3 and 4
- b) 1, 2 and 3 only
- c) 1, 2 and 4 only
- d) None of the above

Q.40) Solution: (c)

Basic Info:

Non-Conventional Sources of Energy: Natural resources like wind, tides, solar, biomass etc. generate energy which is nonconventional sources of energy.

When we cannot reuse a source of energy after using it once we call them **conventional sources of energy** or non-renewable energy resources. They are the most important conventional sources of energy. **These include coal, petroleum, natural gas and nuclear energy.**

Oil is the most widely used source of energy. Coal, petroleum and natural gas account for about 90% of world's production of commercial energy and hydroelectric and nuclear power account for about 10%.