

Q.1) Blood Moon 2018 occurred on July 27-28, 2018. Consider the following statements:

1. The rare celestial event was visible only from few parts of India.
2. In this particular eclipse, Moon passed through central part of Earth's umbral shadow.
3. It was the century's longest total lunar eclipse of 1 hour 43 minutes.

Which of the above statements is/are correct?

- a) Only 1
- b) 1 and 3
- c) 2 and 3
- d) All of the above

Q.1) Solution (c)

Explanation:

Blood Moon 2018 or century's (2001 AD to 2100 AD) longest total lunar eclipse of 1 hour 43 minutes occurred on July 27-28, 2018. The rare celestial event was visible from all parts of India. It was majorly seen in Eastern Hemisphere including Central Asia, Eastern Africa and South East Asia.

In this particular eclipse, Moon passed through central part of Earth's umbral shadow. During this time, Moon was located at apogee (i.e. at farthest from Earth) in its orbit and moved at slower speed in its orbit. During this transition phase, it took longer time for Moon and greater distance of Earth's umbral shadow to travel, making it longest duration of total eclipse of this century. Such long duration of total lunar eclipses earlier had occurred on July 16, 2000 for totality duration of 1 hour 46 minutes.

Q.2) Coastal headlands and Islands of Peru are known for a uniquely-produced natural fertilizer which has a high concentration of nitrates and phosphates. Which of the following is that natural fertilizer?

- a) Green sand
- b) Guano
- c) Blood meal

d) Bone meal

Q.2) Solution (b)

Explanation:

The word "guano" originates from the Andean indigenous language Quechua, which refers to any form of dung used as an agricultural fertilizer. Archaeological evidence suggests that Andean people have collected guano from small islands and points located off the desert coast of Peru for use as a soil amendment for well over 1,500 years.

Greensand is a green mineral compound with a texture similar to fine sand that is commonly used to amend soils. Although it is inorganic, meaning that it does not contain living organisms or the byproducts of living organisms, organic gardeners use greensand as a natural soil amendment and typically find that it improves the general vigor of their plants.

Q.3) Consider the following statements:

1. Diastrophism, deposition and volcanism are endogenic geomorphic processes.
2. Weathering, mass wasting, erosion are exogenic geomorphic processes.
3. Orogenic processes involve mountain building through severe folding and affecting long and narrow belts of the earth's crust.
4. Epeirogenic processes involving uplift or warping of large parts of the earth's crust.

Which of the above statements are correct?

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

Q.3) Solution (c)

Explanation: Statement 1 is wrong as deposition is exogenic not endogenic geomorphic processes.

Q.4) Consider the following statements regarding the hydration process:

1. Hydration is the chemical addition of water.

2. This process is reversible and short, continued repetition of this process causes fatigue in the rocks and may lead to their disintegration.

Which of the above statements is/are correct?

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

Q.4) Solution (a)

Explanation:

- The process of hydration is long not short.
- Hydration is the chemical addition of water. Minerals take up water and expand; this expansion causes an increase in the volume of the material itself or rock.
- This process is reversible and long, continued repetition of this process causes fatigue in the rocks and may lead to their disintegration.
- The volume changes in minerals due to hydration will also help in physical weathering through exfoliation and granular disintegration.

Q.5) Consider the following statements regarding the springs and geysers:

1. Silicate deposits at mouth of springs gives them their distinct colours while the geysers are very colorful because of the presence of cyanobacteria of different colors.
2. Both geysers and springs are found in all parts of the world.

Which of get above statements are correct?

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

Q.5) Solution (d)

Explanation:

Silicate deposits at mouth of geysers gives them their distinct colours while the springs are very colorful because of the presence of cyanobacteria of different colors.

Springs are found in all parts of the world. But the geysers are found in very few regions. Iceland is famous for geysers.

Q.6) Consider the following statements:

1. Meteors and Earth are solar system objects that are born from the same nebular cloud.
2. Gravity anomalies give us information about the distribution of mass of the material in the crust of the earth.

Which of the above statements are correct?

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

Q.6) Solution (c)

Explanation:

Meteors and Earth are solar system objects that are born from the same nebular cloud. Thus they are likely to have a similar internal structure.

Gravitation: The gravitation force (g) is not the same at different latitudes on the surface. It is greater near the poles and less at the equator. This is because of the distance from the center at the equator being greater than that at the poles.

The gravity values also differ according to the mass of material. The uneven distribution of mass of material within the earth influences this value. Such a difference is called gravity anomaly. Gravity anomalies give us information about the distribution of mass of the material in the crust of the earth.

Q.7) Consider the following statements regarding the cyclones:

1. The tropical cyclone formation is due to frontogenesis while frontogenesis is absent in case of temperate cyclone.
2. Tropical cyclones are confined to a smaller area while the temperate cyclones cover large area.
3. In tropical cyclone rainfall stays for many days while in temperate cyclones rainfall doesn't last for more than few hours.

4. In tropical cyclone there is greater destruction due to winds, storm surges and torrential rains while in temperate cyclone there is less destruction due to winds but heavy destruction due to flooding.

Which of the following statements are incorrect?

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

Q.7) Solution (c)

Explanation:

The temperate cyclone formation is due to frontogenesis while frontogenesis is absent in case of tropical cyclone.

In tropical cyclone rainfall is heavy but does not last beyond a few hours. If the cyclone stays at a place, the rainfall may continue for many days.

In temperate cyclone, rainfall is slow and continues for many days, sometimes even weeks.

Note: Temperate cyclones do not cause any destruction. It is good for society and economy and causes winter rainfall on the west coast of the continents.

Q.8) Consider the following statements:

- 1. Climate is continental with extremes of temperature.
- 2. The maritime influence in the southern hemisphere causes more rainfall
- 3. Local farmers welcome the Chinook winds
- 4. The growth of grasses is not abruptly checked by summer droughts or winter cold.

The above statements represent which type of climate?

- A. China type of climate
- B. Monsoon climate
- C. Steppe climate
- D. Dessert arid climate

Q.8) Solution (c)

Explanation: steppe type of climate

Temperature

Climate is continental with extremes of temperature. Temperatures vary greatly between summer and winter. The summers are hot and the winters are cold.

Precipitation

The average rainfall may be taken as about 45 cm, but this varies according to location from 25 cm to 75 cm. The maritime influence in the southern hemisphere causes more rainfall

Chinook: Local winds in Steppe regions on the eastern slopes of the Rockies in Canada and U.S.A., a local wind, similar to the Fohn in Switzerland, called the Chinook, comes in a south-westerly direction to the Prairies and has a considerable effect on the local pastures.

Natural Vegetation of Steppe Climate**Grasses**

Greatest difference from the tropical savanna is that steppes are practically treeless and the grasses are much shorter. Grasses are fresh and nutritious. This is typical of the grass of the wheat-lands in North America, the rich black earth or chernozem areas of Russian Ukraine and the better watered areas of the Asiatic Steppes.

Where the rainfall is light or unreliable, or the soil is poor, as in the continental interiors of Asia the short steppe type of grass prevails. The grasses are not only shorter but also wiry [lean, tough] and sparse [thinly dispersed or scattered].

These areas are less suitable for arable farming and are used for some form of ranching as in the High Plains of U.S.A. The growth of grasses is not abruptly checked by summer droughts or winter cold. Polewards, an increase in precipitation gives rise to a transitional zone of wooded steppes where some conifers gradually appear.

Does not have much animal diversity. Horses are common in Asian Steppes.

Q.9) Consider the following statements regarding layers of atmosphere:

1. Troposphere is also called the convective region, since all convection stops at Tropopause.

2. Stratosphere is almost free from clouds and associated weather phenomenon, making conditions most ideal for flying aeroplanes. So aeroplanes fly in lower stratosphere, sometimes in upper troposphere where weather is calm.
3. Because of the presence of ozone molecules, Ozonosphere absorbs the harmful ultraviolet radiation.
4. Meteorites burn up in mesosphere on entering from the space.
5. The International Space Station and satellites orbit in thermosphere.

Which of the following statements are correct?

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

Q.9) Solution (d)

TROPOSPHERE

- The troposphere is the lowest atmospheric layer. On average, the troposphere extends from the ground to about 10 kilometers (6 miles) high, ranging from about 6 kilometers (4 miles) at the poles to more than 16 kilometers (10 miles) at the Equator. The top of the troposphere is higher in summer than in winter. The troposphere ends with the Tropopause.
- The temperature in this layer, as one goes upwards, falls at the rate of 5°C per kilometer, and reaches -45°C at the poles and -80°C over the equator at Tropopause (greater fall in temperature above equator is because of the greater thickness of troposphere – 18 km). The troposphere is marked by temperature inversion, turbulence and eddies. It is also called the convective region, since all convection stops at Tropopause.

STRATOSPHERE

- The stratosphere extends from the tropopause, the upper boundary of the troposphere, to about 50 kilometers (32 miles) above the Earth's surface. This rise is due to the presence of ozone (harmful ultraviolet radiation is absorbed by ozone).
- This layer is almost free from clouds and associated weather phenomenon, making conditions most ideal for flying aeroplanes. So aeroplanes fly in lower stratosphere, sometimes in upper troposphere where weather is calm.
- Sometimes, cirrus clouds are present at lower levels in this layer.

- **MESOSPHERE**

- The mesosphere extends from the stratopause (the upper boundary of the stratosphere) to about 85 kilometers (53 miles) above the surface of the Earth. Here, temperatures again begin to fall. Meteorites burn up in this layer on entering from the space.

THERMOSPHERE

- In thermosphere temperature rises very rapidly with increasing height. Ionosphere is a part of this layer. It extends between 80 - 400 km.
- This layer helps in radio transmission. In fact, radio waves transmitted from the earth are reflected back to the earth by this layer.
- Person would not feel warm because of the thermosphere's extremely low pressure. The International Space Station and satellites orbit in this layer. (Though temperature is high, the atmosphere is extremely rarified – gas molecules are spaced hundreds of kilometers apart. Hence a person or an object in this layer doesn't feel the heat)
- Aurora's are observed in lower parts of this layer.

IONOSPHERE

- This layer is located between 80 km and 400 km and is an electrically charged layer. This layer is characterized by ionization of atoms.
- Because of the electric charge, radio waves transmitted from the earth are reflected back to the earth by this layer. Temperature again starts increasing with height because of radiation from the sun.

EXOSPHERE

- This is the uppermost layer of the atmosphere extending beyond the ionosphere above a height of about 400 km. The air is extremely rarefied and the temperature gradually increases through the layer.
- Light gases like helium and hydrogen float into the space from here.
- Temperature gradually increases through the layer. (As it is exposed to direct sunlight). This layer coincides with space.

Q.10) Consider the following statements regarding the westerlies:

1. The westerlies are the winds blowing from the sub-tropical high pressure belts towards the sub tropical low pressure belts.
2. They blow from south-west to northwest in the northern hemisphere and north-east to south-east in the southern hemisphere.

3. The westerlies of the northern hemisphere are stronger and persistent due to the vast expanse of water, while those of the southern hemisphere are irregular because of uneven relief of vast land-masses.
4. The westerlies are best developed between 40° and 65° S latitudes. These latitudes are often called Roaring Forties, Furious Fifties, and Shrieking Sixties – dreaded terms for sailors.

Which of the above statements are incorrect?

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

Q.10) Solution (a)

Explanation:

The Westerlies are the winds blowing from the sub-tropical high pressure belts towards the sub polar low pressure belts. They blow from south-west to north-east in the northern hemisphere and north-west to south-east in the southern hemisphere. The westerlies of the southern hemisphere are stronger and persistent due to the vast expanse of water, while those of the northern hemisphere are irregular because of uneven relief of vast land-masses. The westerlies are best developed between 40° and 65° S latitudes. These latitudes are often called Roaring Forties, Furious Fifties, and Shrieking Sixties – dreaded terms for sailors.

Q.11) Consider the following statements regarding the continental shelves:

1. Continental Shelf is the gently sloping seaward extension of continental plate.
2. These extended margins of each continent are occupied by relatively deep seas and gulfs.
3. The shelf typically ends at a very steep slope, called the shelf break.

Which of the above statements are correct?

- a) Only 1,2
- b) Only 2,3
- c) Only 1,3
- d) All of the above

Q.11) Solution (c)**Explanation:**

These extended margins of each continent are occupied by relatively shallow (not deep) seas and gulfs.

Extra information:

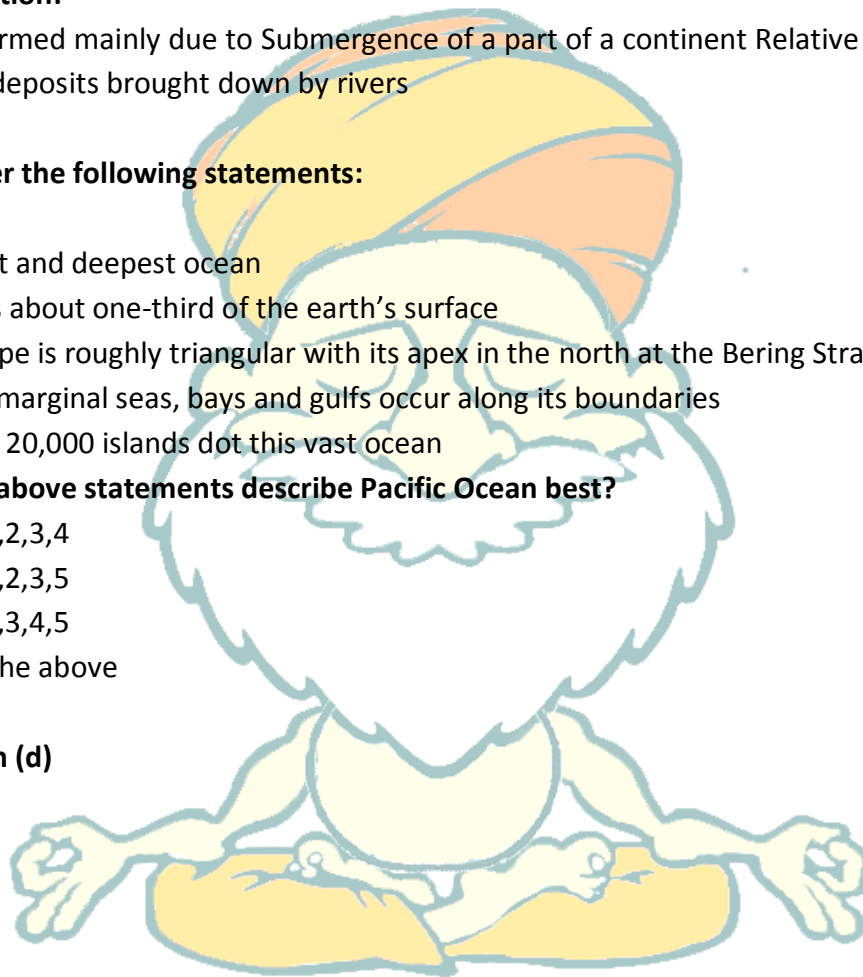
The shelf is formed mainly due to Submergence of a part of a continent
Relative rise in sea level
Sedimentary deposits brought down by rivers

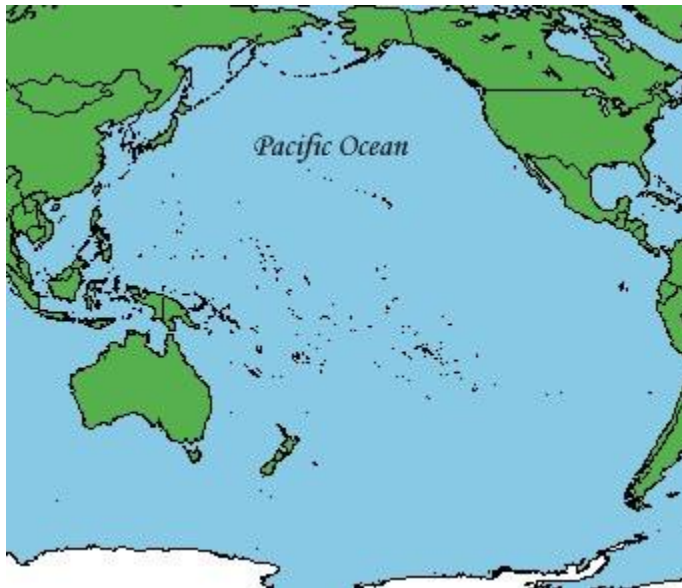
Q.12) Consider the following statements:

1. Largest and deepest ocean
2. Covers about one-third of the earth's surface
3. Its shape is roughly triangular with its apex in the north at the Bering Strait
4. Many marginal seas, bays and gulfs occur along its boundaries
5. Nearly 20,000 islands dot this vast ocean

Which of the above statements describe Pacific Ocean best?

- a) Only 1,2,3,4
- b) Only 1,2,3,5
- c) Only 1,3,4,5
- d) All of the above

Q.12) Solution (d)



Q.13) Consider the following statements:

1. Himalayan Mountains are highly stable just like peninsular plateau.
2. Indo gangetic plain are the most youthful, monotonous [lack of change or variety] region prone to tectonic forces.

Which of the above statements are correct?

- a) Only 1
- b) Only 2
- c) Both
- d) None

Q.13) Solution (b)

Explanation:

Indo-Gangetic Plain lie Between Peninsular and Himalayan region. They are Most youthful, monotonous [lack of change or variety] region prone to tectonic forces.

Himalayan mountains are young alpine mountains experiencing a lot of tectonic activity. They are one of the most unstable parts of India. On contrary, Deccan plateau is a part of very stable shield.

Q.14) The world's highest motorable road passes through which pass?

- a) Banihal pass
- b) Khardungla
- c) Changla
- d) Aghil

Q.14) Solution (b)

Khardungla pass near leh in ladakh is the pass and world's highest motorable road passes through this pass. It remains closed in winter due to heavy snowfall.

Q.15) Consider the following statements:

1. The Gir Range is located in the southern part of the Kathiawar peninsula.
2. It is covered with dense dry deciduous forests and is famous as home of the Gir lion.
3. Kutch and Kathiawar, though an extension of Peninsular plateau are not treated as part of the Western Coastal Plains.

Which of the above statements are correct?

- a) Only 1,2
- b) Only 2,3
- c) Only 1,3
- d) All of the above

Q.15) Solution (a)

Explanation:

Statement 3 is incorrect because Kutch and Kathiawar, though an extension of Peninsular plateau (because Kathiawar is made of the Deccan Lava and there are tertiary rocks in the Kutch area), they are still treated as integral part of the Western Coastal Plains as they are now leveled down.

Q.16) Which of the following river is considered to be part of both Himalayan and peninsular river system?

- a) Godavari River System
- b) Krishna River System
- c) Narmada River System

d) None of the above

Q.16) Solution (d)

Explanation: All are peninsular rivers (this question is given just to check the stability in the aspirant and if he is able to control himself from over thinking)

Q.17) Consider the following statements regarding the temperature during South West Monsoon Season:

1. Sudden onset of South West Monsoons leads to significant fall in temperature.
2. The temperature remains less uniform throughout the rainy season.
3. There is rise in temperature whenever there is break in the monsoons.
4. The diurnal range of temperature is small due to clouds and rains.

Which of the above statements are correct?

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

Q.17) Solution (d)

All the statements given above are correct.

The period June to September is referred to as the 'Southwest Monsoon' period. Southwest Monsoon period is the principal rainy season for the Indian subcontinent. This is the summer monsoon period where the southwest monsoon holds away over the country. The whole country receives nearly 75% of its rainfall during this period.

Southwest monsoon sets in over the extreme southwestern tip of the peninsula by the end of May. The onset of Monsoon is characterized by a sudden spurt of rainfall activity. It progresses inland in stages and covers the entire country by the middle of July.

It starts retrieving from the extreme northwest by the beginning of September, progressively receding southwards.

Q.18) Consider the following statements regarding monsoon season:

1. Most severe and devastating tropical cyclones originate in the Indian seas especially in the Arabian Sea.
2. Unlike the sudden burst of the advancing monsoons, the withdrawal is rather gradual and takes about three months.

Which of the above statements are correct?

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

Q.18) Solution (b)

Explanation: Most severe and devastating tropical cyclones originate in the Indian seas especially in the Bay of Bengal(it's more in bay of Bengal than in Arabian sea.

Q.19) Consider the following statements regarding the Haematite:

1. It's reddish; best quality iron ore with 70 per cent metallic content.
2. Found in Dharwad and Cuddapah rock systems of the Gangetic region .
3. 80 per cent of haematite reserves are in Odisha, Jharkhand, Chhattisgarh and Andhra Pradesh.
4. In the western section, Karnataka, Maharashtra and Goa has this kind of ore.

Which of the above statements are correct?

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

Q.19) Solution (c)

Explanation:

- Haematite is reddish; best quality; 70 per cent metallic content.
- Found in Dharwad and Cuddapah rock systems of the "Peninsular" India.

- 80 per cent of haematite reserves are in Odisha, Jharkhand, Chhattisgarh and Andhra Pradesh.
- In the western section, Karnataka, Maharashtra and Goa has this kind of ore.

Q.20) Consider the following statements:

1. It is most widely available and used coal.
2. Dense, compact, and is usually of black colour.
3. Does not have traces of original vegetation material.
4. Calorific value is very high due to high proportion of carbon and low moisture.
5. Used in production of coke and gas.

The above statements are describing which coal?

- a) Peat
- b) Bituminous
- c) Lignite
- d) Anthracite

Q.20) Solution (b)

Bituminous coal or black coal is a relatively soft coal containing a tarlike substance called bitumen or asphalt. It is of higher quality than lignite coal but of poorer quality than anthracite. Formation is usually the result of high pressure being exerted on lignite. Its coloration can be black or sometimes dark brown; often there are well-defined bands of bright and dull material within the seams. These distinctive sequences, which are classified according to either "dull, bright-banded" or "bright, dull-banded", is how bituminous coals are stratigraphically identified.

Bituminous coal is the second highest quality of coal (below anthracite) and the most abundant type. Usually, bituminous coal comes from fairly old coal deposits (around 300 million years old). The energy density of this coal is relatively high, therefore, releases a significant amount of energy when burned.

Q.21) Consider the following statements regarding the cropping systems:

1. The main objective of mixed cropping is to utilise the space between rows of main crop and to produce more grain per unit area while main objective of inter cropping is insurance against crop failure.
2. There is no competition between main and inter crop (subsidiary crop) in mixed crop while there is competition between component crops in inter cropping.

Which of the above statements is/are correct?

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

Q.21) Solution (d)

Statements are interchanged for Mixed cropping and inter cropping.

Extra information:

In inter cropping, the main crop may be a long duration one and the inter crop may be a short duration/early maturing one while in mixed cropping, crops may or may not be of same duration.

Main and inter crops are sown in definite row arrangement in inter cropping while in mixed cropping, there is no specific row arrangement. Generally crop seeds are mixed and broadcasted.

In inter cropping the sowing time of both the crops may or may not be the same. Sometimes the main crop is sown earlier than the inter crop. While in mixed cropping, the sowing time of component crops is same.

Q.22) Consider the following statements regarding the System of Rice Intensification (SRI):

1. SRI is a combination of several practices those include changes in nursery management, time of transplanting, water and weed management.
2. It emphasizes altering of certain agronomic practices of the conventional way of rice cultivation.
3. As per SRI, Rice yield increased with more water and with reduction in chemical inputs.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.22) Solution (a)

Explanation:

SRI is not a fixed package of technical specifications, but a system of production with four main components, viz., soil fertility management, planting method, weed control and water (irrigation) management.

Rice yield increased with “less water”(not more) and with reduction in chemical inputs.

Q.23) Consider the following statements regarding the Sustainable Sugarcane Initiative (SSI):

1. Sustainable Sugarcane Initiative (SSI) is an innovative set of agronomic practices that involves using more seeds, raising seeds in a nursery, and following new planting methods, with wiser seed spacing, and better water and nutrient management to increase the cane yield significantly.
2. These methods can increase sugarcane yields by at least 20% with 30% less water and a 25% reduction in chemical inputs.
3. The SSI method of sugarcane cultivation was evolved from the principles of ‘More with Less’ followed in SRI (System of Rice Intensification) and introduced in India in 2009.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.23) Solution (b)

Sustainable Sugarcane Initiative (SSI)

Sustainable Sugarcane Initiative (SSI) is an innovative set of agronomic practices that involves using “less” seeds(not more), raising seeds in a nursery, and following new planting methods, with wiser seed spacing, and better water and nutrient management to increase the cane yield significantly.

SSI methods can increase sugarcane yields by at least 20% with 30% less water and a 25% reduction in chemical inputs.

The SSI method of sugarcane cultivation was evolved from the principles of ‘More with Less’ followed in SRI (System of Rice Intensification) and introduced in India in 2009.

Q.24) Consider the following statements regarding the zero tillage:

1. In this, new crop is planted in the residues of the previous crop without any prior soil tillage or seed bed preparation.
2. Zero tilled soils are homogenous in structure with more number of earthworms.
3. Higher amount of nitrogen has to be applied for mineralization of organic matter in zero tillage.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.24) Solution (d)

Explanation:

Zero tillage (No tillage): In this, new crop is planted in the residues of the previous crop without any prior soil tillage or seed bed preparation and it is possible when all the weeds are controlled by the use of herbicides.

Advantages of Zero tillage:

- Zero tilled soils are homogenous in structure with more number of earthworms.
- Organic matter content increases due to less mineralization.
- Surface runoff is reduced due to presence of mulch.

Disadvantages of Zero tillage

- Higher amount of nitrogen has to be applied for mineralization of organic matter in zero tillage.
- Perennial weeds may be a problem.
- High number of volunteer plants and buildup of pests.

Q.25) Consider the following statements regarding the irrigation system:

1. Drip irrigation is also called trickle irrigation and involves dripping water onto the soil at very high rates from a system of small diameter plastic pipes fitted with outlets called emitters.
2. In the sprinkler method of irrigation, water is sprayed into the soil and allowed to reach the ground surface.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.25) Solution (d)

Sprinkler Irrigation:

In the sprinkler method of irrigation, water is sprayed into the air and allowed to fall on the ground surface somewhat resembling rainfall. The spray is developed by the flow of water under pressure through small orifices or nozzles.

Drip irrigation:

Drip irrigation is also called trickle irrigation and involves dripping water onto the soil at very low rates from a system of small diameter plastic pipes fitted with outlets called emitters. Water is applied close to plants so that only part of the soil in which the roots grow is wetted, unlike surface and sprinkler irrigation, which involves wetting the whole soil profile.

Q.26) Consider the following statements regarding the volcanoes type:

1. These volcanoes are mostly made up of basalt, a type of lava that is very fluid when erupted.

2. They become explosive if somehow water gets into the vent; otherwise, they are less explosive.
3. These volcanoes are not steep
4. Hawaiian volcanoes are most famous examples.

The above statements are defining which of the following:

- a) Composite volcanoes
- b) Shield volcanoes
- c) Conical volcanoes
- d) Central volcanoes

Q.26) Solution (b)

Extra information:

Composite Type Volcanic Landforms are conical or central type volcanic landforms. Along with andesitic lava, large quantities of pyroclastic material and ashes find their way to the ground.

Andesitic lava along with pyroclastic material accumulates in the vicinity of the vent openings leading to formation of layers, and this makes the mounts appear as composite volcanoes. The highest and most common volcanoes have composite cones. They are often called strato – volcanoes.

Stromboli 'Lighthouse of the Mediterranean', Mt. Vesuvius, Mt. Fuji etc. are examples.

Q.27) Consider the following statements regarding the P wave of earthquake:

1. They are a type of longitudinal or compressional waves.
2. Particles of the medium vibrate perpendicular to the direction of propagation of the wave.
3. P-waves move faster and are the first to arrive at the surface.
4. These waves are of low frequency.
5. They can travel in all mediums

Which of the above statements are correct?

- a) Only 1, 2 and 3
- b) Only 1, 3, and 5

- c) Only 2, 4 and 5
- d) Only 1, 4 and 5

Q.27) Solution (b)

Explanation:

Primary Waves (P waves) Also called as the longitudinal or compressional waves.

Particles of the medium vibrate along the direction of propagation of the wave. P-waves move faster and are the first to arrive at the surface. These waves are of high frequency. They can travel in all mediums.

Velocity of P waves in Solids > Liquids > Gases

Their velocity depends on shear strength or elasticity of the material.

Q.28) Consider the following statements:

1. Westerlies come all the year round.
2. There is a tendency towards an autumn or winter maximum of rainfall.
3. Light snow falls in winter.
4. Ports are never frozen but frosts do occur on cold nights.
5. The seasons are very distinct .
6. And the climate is very favorable for maximum human output.

The above statements define which type of climate?

- a) China type of climate
- b) British type of climate
- c) Laurentian type of climate
- d) Savannah type of climate

Q.28) Solution (b)

British Type Climate or Cool Temperate Western Margin Climate or North-West European Maritime Climate.

The cool temperate western margins are under the influence of the Westerlies all-round the year.

They are the regions of frontal cyclonic activity [Temperate Cyclones].

This type of climate is typical to Britain, hence the name 'British Type'.

Also called as North-West European Maritime Climate due to greater oceanic influence.

Q.29) Consider the following statements:

1. Stable climatic conditions
2. Perpetually cold and shallow water.
3. Abundant Plankton
4. Little or no pollution

Which of the following includes the idea condition for the growth of coral reefs?

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

Q.29) Solution (c)

Ideal Conditions for Coral Growth

Stable climatic conditions:

Corals are highly susceptible to quick changes. They grow in regions where climate is significantly stable for a long period of time. Perpetually warm waters: Corals thrive in tropical waters [30°N and 30°S latitudes, The temperature of water is around 20°C] where diurnal and annual temperature ranges are very narrow.

Shallow water:

Corals require fairly good amount of sunlight to survive. The ideal depths for coral growth are 45 m to 55 m below sea surface, where there is abundant sunlight available. Clear salt water: Clear salt water is suitable for coral growth, while both fresh water and highly saline water are harmful.

Abundant Plankton:

Adequate supply of oxygen and microscopic marine food, called plankton [phytoplankton], is essential for growth. As the plankton is more abundant on the seaward side, corals grow rapidly on the seaward side. Little or no pollution: Corals are highly fragile and are vulnerable to climate change and pollution and even a minute increase in marine pollution can be catastrophic.

Q.30) Consider the following statements:

1. The ocean water is cooled by processes of back radiation, evaporation and exchange of heat.
2. The ocean water is cooled by process of convectional current.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.30) Solution (d)

The conventional currents:

Convection in the ocean is caused by a negative buoyancy force, that is, whenever denser fluid happens to exist above lighter fluid. The top-heavy situation overturns to seek a situation of lower potential energy. The overturning motion is called convection.

There are two ways by which a top-heavy situation can be created, by a temperature inversion (colder water above warmer water) or by a salinity inversion (saltier water above fresher water). This is because water becomes denser when temperature decreases and salinity increases. Combinations are also possible. Here are examples.

Surface cooling: Ocean water exposed to a colder atmosphere will see its surface water cool faster than water at depth. Colder, denser water lying above warmer, lighter water will generate convection.

Surface evaporation: When ocean water evaporates, fresh (distilled) water is removed, leaving an unchanged amount of salt in less liquid water, thus increasing salinity near the surface. Saltier, denser water lying above fresher, lighter water will generate convection.

The ocean water is cooled by Back radiation (heat budget) from the sea surface takes place as the solar energy once received is reradiated as long wave radiation (terrestrial radiation or infrared radiation) from the seawater.

Exchange of heat between the sea and the atmosphere if there is temperature difference.

Evaporation: Heat is lost in the form of latent heat of evaporation (atmosphere gains this heat in the form of latent heat of condensation).

Q.31) Consider the following statements regarding the tidal bore:

1. The steep-nosed tide crest looks like a vertical wall of-water rushing upstream and is known as a tidal bore.
2. The favorable conditions for tidal bore include strength of the incoming tidal wave, slim and depth of the channel and the river flow.

Which of the above statements are correct?

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

Q.31) Solution (c)

Explanation:

The steep-nosed tide crest looks like a vertical wall of-water rushing upstream and is known as a tidal bore.

The favorable conditions for tidal bore include strength of the incoming tidal wave, slim and depth of the channel and the river flow.

There are exceptions. The Amazon River is the largest river in the world. It empties into the Atlantic Ocean. The mouth of the Amazon is not narrow, but the river still has a strong tidal bore. A tidal bore develops here because the mouth of the river is shallow and dotted by many low-lying islands and sand bars.

In India, tidal bores are common in the Hooghly river. Most powerful tidal bores occur in Qiantang River in China.

The name 'bore' is because of the sound the tidal current makes when it travels through narrow channels.

Bores occur in relatively few locations worldwide, usually in areas with a large tidal range, typically more than 6 metres (20 ft) between high and low water.

Q.32) Consider the following statements regarding the geographical extent of india:

1. The southernmost point of the country is the Pygmalion Point or Indira Point is located at 16° 45' N latitude.

2. North-south extent from Indira Col in Kashmir to Kanniyakumari is less than the East-west width from the Rann of Kachachh to Arunachal Pradesh.
3. India is the seventh largest country of the world.
4. India accounts for about 2.4 per cent of the total surface area of the world.

Which of the above statements are correct?

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

Q.32) Solution (b)

Explanation:

- The southernmost point of the country is the Pygmalion Point or Indira Point is located at $6^{\circ} 45' N$ latitude(u don't have to learn exact number but 16 as written in options is way too far so it's about common sense)
- North-south extent from Indira Col in Kashmir to Kanniyakumari is 3,214 km.
- East-west width from the Rann of Kachachh to Arunachal Pradesh is 2,933 km.
- So east west is lesser than north south extent.

Q.33) Consider the following statements regarding the ITCZ:

1. This is the region of descending air, maximum clouds and heavy rainfall.
2. The location of ITCZ shifts north and south of equator with the change of season.
3. In the summer season, the sun shines vertically over the Tropic of Cancer and the ITCZ shifts northwards.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.33) Solution (b)

Explanation:

This is the region of “ascending” air, maximum clouds and heavy rainfall. The location of ITCZ shifts north and south of equator with the change of season. In the summer season, the sun shines vertically over the Tropic of Cancer and the ITCZ shifts northwards.

Extra information:

The southeast trade winds of the southern hemisphere cross the equator and start blowing in southwest to northeast direction under the influence of Coriolis force. These displaced trade winds are called south-west monsoons when they blow over the Indian sub-continent.

The front where the south-west monsoons meet the north-east trade winds is known as the Monsoon Front (ITCZ). Rainfall occurs along this front. In the month of July the ITCZ shifts to 20°- 25° N latitude and is located in the Indo-Gangetic Plain and the south-west monsoons blow from the Arabian Sea and the Bay of Bengal. The ITCZ in this position is often called the Monsoon Trough [maximum rainfall].

Q.34) Consider the following statements regarding Factors that influence the location of Iron and Steel industry:

1. Raw materials
2. Transportation and other infrastructure
3. Investment and Entrepreneurship
4. Labour
5. Market
6. Climate

Which of the above options are the factors that influence the location of Iron and Steel industry?

- a) 1,2,3,4,5
- b) 2,3,4,5,6
- c) 1,2,3,5,6
- d) All of the above

Q.34) Solution (a)

Explanation:

Factors that influence the location of Iron and Steel industry

- Raw materials – iron ore, coal, limestone, etc.
- Transportation and other infrastructure – road, rail, ports etc.
- Investment and Entrepreneurship = banking facilities, human capital for managerial roles.
- Labour – unskilled to semi-skilled workforce for manual operations, skilled workforce for technical operations.
- Market – construction industry, automobile industry etc.
- Government policy – Development agenda, land acquisition, ease of doing business = labor laws, unambiguous and fair taxation policy, least government interference, less red tapeism, quick environmental clearance.

Q.35) Bindibu tribe is tribe of which dessert?

- a) Australia
- b) Sahara
- c) Gobhi
- d) Kalahari

Q.35) Solution (a)

Bindibu is an aboriginal tribe of Australia.

Q.36) Consider the following statements regarding the Problems of Coal Mining in India:

1. The distribution of coal is uneven.
2. High ash content and high caloric value.
3. Large percentage of coal is taken out from open cast mines.
4. Heavy losses due to fires in the mines.

Which of the above statements are correct?

- a) Only 1,2
- b) Only 1,3
- c) Only 1,4

d) Only 1,2,4

Q.36) Solution (c)

Explanation:

Problems of Coal Mining in India:

- The distribution of coal is uneven.
- High ash content and low caloric value.
- Large percentage of coal is taken out from underground mines. [Very few open cast mines]
- Heavy losses due to fires in the mines.
- Pilferage at several stages also adds to losses – bad transportation infrastructure.
- Serious problem of environmental pollution. High ash, moisture == more smoke.
- Safety measures against environmental pollution are very costly. Clean coal technology == Complex technology.
- Misuse of good quality coal for burning into transport and industries.
- Short life of metallurgical coal.
- Selective mining leading to large scale wastage of raw coal
- Unscientific method of extraction of coal.

Q.37) Which of the following is the highest peak of Satpura Range?

- a) Gurushikhar
- b) Dhupgarh
- c) Pachmarh
- d) Mahendragiri

Q.37) Solution (b)

Mount Dhupgarh or Dhoopgarh is the highest point in the Satpura Range and in Madhya Pradesh, India. Located in Pachmarhi, it has an elevation of 1,350 metres (4,429 ft). It is the highest point of Madhya Pradesh.

Q.38) Tropic of Cancer passes through which of the following group of Indian States?

- a) Gujarat, MP, Chattisgarh, Manipur

- b) Tripura, Jharkhand, West Bengal
- c) UP, MP, Bihar, Jharkhand
- d) Maharashtra, Chattisgarh, Orissa, Andhra Pradesh

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

The Tropic of Cancer divided India into almost 2 equal parts. It passes through 8 Indian States of India – Gujarat, Rajasthan, MP, Chattisgarh, Jharkhand, West Bengal, Tripura and Mizoram.

Q.39) Consider the following statements regarding the soil profile:

1. In E horizon, "E" stands for eluviated layer.
2. It is the horizon that has been significantly leached of clay, iron, and aluminum oxides, which leaves a concentration of resistant minerals, such as quartz, in the sand and silt sizes.
3. These are present only in older, well-developed soils, and generally occur between the A and B horizons.

Which of the above statements are correct?

- a) Only 1 and 2
- b) Only 2 and 3
- c) Only 1 and 3
- d) All of the above

Q.39) Solution (d)**E-horizon**

- It is a light coloured eluviated layer, that is eroded of its nutrients.
- It underwent significant leaching which took away the nutrients like iron, aluminium, clay etc., leaving behind resistant, undissolvable materials like quartz, sand, and silt.
- It is an older layer usually found between the A-horizon and the B-horizon.

Q.40) Which of the following Mountain passes forms the 'tri-junction' of India, China and Myanmar?

- a) Jalep la
- b) Nathu la
- c) Bomdi la
- d) Diphu pass

Q.40) Solution (d)

Diphu Pass is a mountain pass around the area of the disputed tri-point borders of India, China, and Myanmar. Diphu Pass is also a strategic approach to eastern Arunachal Pradesh. It lies on the McMahon Line.

