1. Arrange the following mountain passes from east to west direction:

- 1. Bara-Lacha La
- 2. Shipki La
- 3. Banihal Pass
- 4. Nathu La

Select the correct answer using the codes given below:

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

Ans: (b)

Explanation:

- Mountain passes are natural or man-made routes that cut through mountain ranges and connect one side of the range to the other.
- The Nathu La pass connects Sikkim with Tibet.
- Shipki La connects the districts of Kinnaur (Himachal Pradesh) and Tibet.
- The Bara-Lacha La is a well-known mountain pass in Ladakh. This Himalayan Zanskar Range pass connects Lahaul and Ladakh and is known as the "Gateway to Ladakh."
- Banihal Pass: A path from Jammu to Srinagar traveled via this mountain pass and the Jawahar Tunnel was built beneath it. So, option (b) is correct.

2. Consider the following statements regarding Lakshadweep Islands:

- 1. It is the only chain of coral islands in the Indian sub-continent.
- 2. Kavaratti Island is the largest island of Lakshadweep.
- 3. The soil of Lakshadweep is formed due to the disintegration of Dravidian rocks.
- 4. It consists of islands like Amini, Andrott, Bitra which are volcanic in nature.

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

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

Ans: (b)

Explanation:

- The Lakshadweep Islands are located in the Arabian Sea with a total area of 32 square kilometers. Kavaratti is the capital of the Lakshadweep Islands.
- Statement 1 is correct: It the one and the only chain of coral island in the Indian sub-continent. These have been formed because of the coral gathering on the volcanic crests in the Indian Ocean that have been submerged long time back.
- Statement 2 is incorrect: Andrott Island is the largest island in the Lakshadweep group of islands ith an area of 4.90 sq km and It lies in the east-west direction. It is the only island having a very small lagoon area.
- **Statement 3 is incorrect:** The soil of Lakshadweep is formed due to the disintegration of limestones from the corals and sedimentary rocks. The fine soil that is made up of the coral dust is silvery white in colour.
- Statement 4 is correct: Lakshadweep Island can be called a volcanic island because of its volcanic base. The different coral islands existing there now are actually volcanic islands of the territory. Some of the volcanic islands in Lakshadweep are: Agatti Island, Bangaram Island, Amini, Andrott, Bitra, Chetlat, Kiltan etc.
- 3. Consider the following pairs:

River	Source of Origin
1. Jhelum	Verinag
2. Ghagra	Mapchachungo glacier
3. Damodar	Amarkantak plateau
4. Mahanadi	Sihawa

How many pairs given above is/are correctly matched?

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

Ans: (c)

Explanation:

- Pair 1 is correct: The Jhelum River rises from a spring at Verinag situated at the foot of the Pir Panjal in the south-eastern part of the valley of Kashmir. It is an important tributary of the Indus. It flows through Srinagar and the Wular lake before joining the Chenab near Jhang in Pakistan.
- Pair 2 is correct: The Ghaghara originates in the glaciers of Mapchachungo located in the Tibetan Plateau. Its tributaries are Tila, Seti, Beri and Sarda. It is a tributary of river Ganga.
- Pair 3 is incorrect: The Damodar River originates from the eastern margins of the Chotanagpur Plateau in Jharkhand. It flows through a rift valley and finally joins the Hugli. The Barakar is its main tributary. The Son River originates in the Amarkantak plateau. It is a south bank tributary of the Ganga.
- Pair 4 is correct: The Mahanadi rises near Sihawa in Raipur district of Chhattisgarh. It is 851 km long and its catchment area spreads over Madhya Pradesh, Chhattisgarh and Odisha. It discharges its water into the Bay of Bengal.

4. Consider the following pairs about shifting cultivation and their location:

Shifting Cultivation	Location
1. Podu	Western Ghats
2. Kumari	Himalayan Belt
3. Valre	Assam
4. Kuruwa	Jharkhand

How many of the pairs given above is/are correctly matched?

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

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Ans: (a)

Explanation:

- Shifting cultivation, also known as shifting farming, is a technique of agriculture in which primitive people of the tropical forest relocate their plots of agricultural land by clearing the forest with fire. It is also known as migrating primitive agriculture.
- Pair 1 is incorrect: 'Podu' or 'Penda' cultivation is a type of shifting cultivation that uses slash and burn practices. This is widely used by tribes living in Andhra Pradesh and Telangana areas.
- Pair 2 is incorrect: 'Kumari' is a type of shifting agriculture practiced in the Western Ghats.

- Pair 3 is incorrect: 'Valre' or 'Waltre' agriculture is a type of shifting agriculture practiced in south- eastern Rajasthan.
- **Pair 4 is correct:** 'Kuruwa' is the shifting agriculture used in Jharkhand, and 'Thumming in the north- eastern region.

5. With reference to the comparisons between the Western & Eastern Coastal Plains, consider the following statements:

- 1. The Eastern Coast was formed due to subsidence, while the Western Coast was formed due to emergence.
- 2. Unlike the Eastern Coast, the Western Coast does not have many deltas.
- 3. The Eastern Coast has more ports and natural harbours compared to the Western Coast.

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

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

Ans: (a)

Explanation:

- The Coastal Plains are one of India's physiographic divisions. They are strips of beaches between India's coastline and the Western and Eastern Ghats.
- Statement 1 is incorrect: The Western (not the Eastern) Coast is formed due to subsidence, while the Eastern (not Western) Coast is formed due to emergence. Cities like Dwarka in Gujarat are now under water, suggesting that the region of the Western Coastal Plains underwent subsidence (sinking down).
- Statement 2 is correct: The rivers draining into the Arabian Sea via the Western Coastal Plain (like Narmada, Tapti, etc) do not create deltas. This is because they flow through very rocky plateaus, and don't collect a lot of silt through their course.
- On the other hand, rivers draining into the Bay of Bengal via the Eastern Coastal Plains (like Krishna, Cauvery, Godavari, Mahanadi) form big deltas, as they collect more sediments and the slope of the continental shelf adjacent to the Eastern Coast is gentle, allowing formation of deltas.
- Statement 3 is incorrect: The Eastern Coast has a broad continental shelf, with deltas. This does not allow formation of natural harbours and ports, as ships get stuck in this kind of formation. On the other hand, the Western Coastal Plains are free of silt and sediments of deltas, and have a narrow continental shelf, which allows the deep waters that facilitate the formation of natural ports and harbours, like Kandla, Mazgaon, Cochin, Mangalore, etc.

6. Consider the following statements:

Statement-I: The Peninsular rivers are more suitable for Hydroelectric projects than Himalayan rivers. Statement-II: There should be Perennial flow of large volumes of water for power generation.

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Which of the following is correct with reference to the above statements?

- a) Both Statement-I and Statement-II are correct and Statement II is the correct explanation for Statement-I
- b) Both Statement-I and Statement-II are correct and Statement II is not the correct explanation for Statement-I
- c) Statement-I is correct but Statement II is incorrect
- d) Statement-I is incorrect but Statement II is correct

Ans: (d) Explanation:

- The Himalayan Rivers and the Peninsular rivers differ in their Hydro-electric generating capacity due to nature of their flow.
- Statement-I is incorrect: The peninsular rivers are comparatively poor with respect to hydroelectric power potential and production as the peninsular rivers are purely dependent on rainfall as a result of which flow of water in these rivers is very erratic. They have exceptionally high flow during the rainy season which is followed by a prolonged dry season of lean flow. They are thus not perennial rivers and are not much suited to hydroelectric production.
- **Statement-II is correct**: Hydro-electric power generation depends on multiple factors like there should be Perennial flow of large volume of water for power generation, water should fall from sufficient height etc.

7. Which of the following are the reasons behind the occurrence of dry spells of monsoons?

- 1. Less frequency of rain-bearing storms along the Inter Tropical Convergence Zone
- 2. Blowing of the monsoon winds parallel to the west coast
- 3. Southward shifting of the monsoon trough
- 4. Pressure gradient at Gangetic plains weakens

Select the correct answer using the code given below.

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

Ans: (a)

Explanation:

- During the south-west monsoon period after having rains for a few days, if rain fails to occur for one or more weeks, it is known as break in the monsoon. These dry spells are quite common during the rainy season.
- Statement 1 is correct: In northern India rains are likely to fail if the rain-bearing storms are not very frequent along the monsoon trough or the Inter Tropical Convergence Zone (ITCZ) over this region. This would result in a drop in humidity levels in northern plains and the surface winds start blowing from the northwest direction. This would reduce rainfall considerably.
- Statement 2 is correct: Over the west coast the dry spells are associated with days when monsoon winds blow parallel to the coast.
- Statement 3 is incorrect: The monsoon breaks are brought about by the northward shifting of the monsoon trough (minimum low-pressure cell in ITCZ). The axis of the trough lies at the foothills of the Himalayas during the break period. Consequently, a southward position of the monsoon trough is usually an indication of well-distributed rain over central India and the Indo-Gangetic plains.
- Statement 4 is incorrect: The Monsoon trough normally slopes southward with height because there is a drop in temperature. The pressure gradient at surface levels over the Peninsular India weakens, while it becomes more over the Gangetic plains. Normally, the reverse happens during the four month-long Monsoon season.

8. Between which of the given regions is the Duncan Passage situated?

- a) South Andaman and Little Andaman
- b) Suheli and Minicoy islands
- c) Little Nicobar and Great Nicobar
- d) Minicoy and Addu Atoll

Ans: (a)

Explanation:

- The Duncan Passage lies between the Islands of South Andaman in the north and Little Andaman in the south.
- The Duncan Passage is a part of the Andaman Sea, whereas Suheli and Minicoy are islands of Lakshadweep group situated in the Arabian Sea.
- Little Andaman and Great Andaman are separated by a small body of water called St George Channel and not Duncan Passage.
- The Duncan Passage is a part of the Andaman Sea, whereas Minicoy Island of Lakshadweep and Addu Atoll of Maldives are islands situated in the Arabian Sea. **So, option (a) is correct.**
- 9. With reference to various metals and their primary constituents, consider the following pairs:

Metals	Primarily composed of

1. Monel	Copper and Nickel
2. Duralumin	Copper and Tin
3. Brass	Copper and Zinc
4. Bronze	Aluminium and Copper

Ans: (b)

Explanation:

- Monel, Duralumin, Brass, and Bronze are all different types of metals or alloys. These metals can be used for various purposes as their compositions are distinct from each other.
- Pair 1 is correct: Monel is a group of nickel alloys known for their corrosion resistance, high-strength, and durability. It primarily consists of Nickel (approximately 64%) and Copper (approximately 30%), with small amounts of iron, manganese, carbon, and other elements.
- Pair 2 is incorrect: Duralumin is an aluminium alloy consisting of Aluminium (around 90-95%), Copper (3.5-4.5%), and small amounts of Magnesium (0.5-1.5%) and Manganese (0.5-1.5%). It is known for their lightweight yet strong properties.
- Pair 3 is correct: Brass is an alloy primarily composed of copper (usually 55-85%) and Zinc (typically 15- 45%). Brass is known for its malleability, attractive golden appearance, and corrosion resistance.
- Pair 4 is incorrect: Bronze is an alloy primarily composed of Copper and Tin, although other elements can be added to enhance specific properties.

10. With reference to the peninsular block of India, consider the following statements:

- 1. The northern boundary of block runs from Kachchh to Rajmahal Hills.
- 2. Karbi Anglong in the northeast and Rajasthan in the west do not form part of this block.

Which of the statements given above is/are correct?

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

Ans: (a) Explanation:

• Statement 1 is correct: The northern boundary of the Peninsular Block may be taken as an irregular line running from Kachchh along the western flank of the Aravali Range near Delhi and then roughly parallel to the Yamuna and the Ganga as far as the Rajmahal Hills and the Ganga delta.

• Statement 2 is incorrect: The Karbi Anglong and the Meghalaya Plateau in the northeast and Rajasthan in the west are also extensions of this block.

11. Consider the following statements regarding irrigation in India:

- 1. Area under the well irrigation is more than the canal irrigation in India.
- 2. In Tamil Nadu, canals are the principal source of irrigation.
- 3. The plains of North India are mostly tube- well irrigated.
- 4. Maharashtra is the largest area under well irrigation in India.

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

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

Ans: (a) Explanation:

- Statement 1 is correct: Well irrigation accounts for about 63% of net irrigated area in country. There has been a six fold increase in well irrigation since 1950. Canals are second most important source of irrigation in India after wells and tube wells. The Canals are irrigating those lands which have large plains, fertile soils and perennial rivers.
- Statement 2 is incorrect: In Tamil Nadu, wells (not the canals) are the principal source of irrigation accounting for around 55% irrigation.
- Statement 3 is incorrect: The plains of North India are mostly canal (not the tube-well) irrigated. Canal irrigation is most important in the Northern Plains of India because the sources of canals are perennial rivers. Perennial canals are lined to dams and barrages to provide water throughout the year, and they irrigate a vast area.
- Statement 4 is incorrect: Uttar Pradesh has the largest area under well irrigation which is 23% of country's total. Next to Uttar Pradesh are Rajasthan (10%), Punjab (8%), Madhya Pradesh (7.9%), Gujarat (7.3%) and Bihar (6.2%).
- States, where well irrigation plays a significant role, are Uttar Pradesh, Rajasthan, Punjab, Madhya Pradesh, Gujarat, Maharashtra, West Bengal, and Bihar.

12. Consider the following statements about the Brahmaputra River

- 1. It originates in Tibet and enters India through the state of Arunachal Pradesh.
- 2. It is known as the Yarlung Tsangpo in its upper course.
- 3. It forms the world's largest riverine island, Majuli, in the state of Assam.

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

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

Ans: (c)

Explanation:

- Statement 1 is correct: The Brahmaputra originates in Tibet and enters India through the state of Arunachal Pradesh.
- Statement 2 is correct: The Brahmaputra is known as the Yarlung Tsangpo in its upper course in Tibet. As the river originates in southwestern Tibet, it carves through the eastern Himalayas, forming deep gorges such as the Yarlung Tsangpo Grand Canyon. Upon entering India, specifically the state of Arunachal Pradesh, it is referred to as the Brahmaputra.
- **Statement 3 is correct:** The Brahmaputra is associated with many islands, Majuli is formed by the Brahmaputra River, it is the world's largest riverine island.

13. The Godavari River, one of the major rivers of India, flows through which states?

- a) Karnataka and Telangana
- b) Maharashtra and Telangana
- c) Madhya Pradesh and Chhattisgarh
- d) Odisha and West Bengal

Ans: (b)

Explanation:

• The Godavari River flows through the states of Maharashtra and Telangana. The Godavari originates in the central part of India, near Trimbak in the Nashik district of Maharashtra. It is the second-longest river in India after the Ganges. The Godavari flows eastward through the state of Maharashtra, passing through various districts and contributing to the agricultural and economic activities of the region. After traversing Maharashtra, the Godavari continues its course into Telangana, further shaping the landscape and providing water resources for irrigation and other purposes in the state. **So, option (b) is correct.**

14. Consider the following statements:

- 1. The Ganges forms the Sundarbans Delta, the largest delta in the world.
- 2. The Ganges-Brahmaputra Delta is known for its significant mangrove forests.

Which of the statements given above is/are correct?

a) Only 1

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

Ans: (c) Explanation:

- Statement 1 is correct: The Ganges forms the Sundarbans Delta, one of the largest deltas in the world. The Sundarbans Delta is formed by the confluence of several rivers, including the Ganges, Brahmaputra, and Meghna, as they discharge into the Bay of Bengal. The Ganges River plays a significant role in the formation of the Sundarbans Delta. It brings a massive volume of water and sediment from its extensive basin.
- Statement 2 is correct: The Ganges-Brahmaputra Delta is known for its significant mangrove forests. Sundarbans Delta is known for its intricate network of waterways, tidal channels, and mangrove forests. It spans parts of India and Bangladesh, with the majority of the delta lying in Bangladesh. The Sundarbans is ecologically crucial, serving as a habitat for diverse flora and fauna, including the Bengal tiger. It is also recognized as a UNESCO World Heritage Site.

15. Consider the following statements about the Narmada River:

- 1. It flows through the Amarkantak Plateau.
- 2. It has a rift valley between the Vindhya and Satpura ranges.
- 3. It forms the boundary between Maharashtra and Madhya Pradesh.
- 4. It forms a delta.

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

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

Ans: (c) Explanation:

- Statement 1 is correct: The Narmada flows through the Amarkantak Plateau. The Narmada river flows primarily through the states of Madhya Pradesh and Gujarat. It rises in Madhya Pradesh, near Amarkantak, and flows westward through the state.
- Statement 2 is correct: The Narmada has a rift valley between the Vindhya and Satpura ranges.
- Statement 3 is correct: Narmada River is a major river flowing through Madhya Pradesh and eventually entering Gujarat, and it contributes to the northern boundary of Maharashtra.
- Statement 4 is incorrect: The Narmada River does not form a delta. Instead, it has an estuary, a coastal area where freshwater mixes with saltwater. This is a unique feature, as most rivers typically form deltas at their mouths. The Narmada's estuary widens as it meets the Arabian Sea, distinguishing it from rivers that create deltaic landforms.

16. With reference to Lakshadweep, consider the following statements:

- 1. It is island group built of coral deposits.
- 2. It is an archipelago 36 islands.
- 3. The islands are divided by the Ten-degree channel.

How many of the above statements is/are correct?

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

Ans:(b)

Explanation:

- Statement 1 and 2 is correct: Lakshadweep islands are group of 36 islands and the entire island is built of coral deposits.
- Statement 3 is incorrect: The Ten-degree channel separate Andaman and Nicobar Island.

• The Lakshadweep group of islands is broadly divided by The Eleventh-degree channel, north of which is the Amini Island and to the south of the Canannore Island.

17. Consider the following statements regarding Urban Heat Island (UHI):

- 1. It refers to the higher temperatures observed in urban areas as compared to their rural surroundings.
- 2. It is primarily caused by the increased concentration of green spaces in urban areas.

Which of the statements given above is/are correct?

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

Ans: (a)

Explanation:

- Statement 1 is correct: Urban Heat Island refers to the elevated temperatures in urban areas due to human activities, such as the construction of buildings, roads, and the heat generated by various sources.
- Statement 2 is incorrect: UHI is primarily caused by the replacement of natural surfaces with impervious surfaces, such as asphalt and concrete, which absorb and retain heat.

18. Which of the following factors contribute to the occurrence of monsoons?

- 1. Differential heating between land and water.
- 2. Presence of high-pressure systems over oceans.
- 3. Topography.

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

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

Ans: (c) Explanation:

• **Statement 1 is correct:** Differential heating between land and water creates temperature gradients, leading to the development of monsoons. During the summer, land heats up faster than water, causing air to rise over the heated land, creating a low-pressure area. Cooler air from the ocean then moves in to fill this void, resulting in the onset of monsoons.

- Statement 2 is correct: Monsoons are associated with the presence of high-pressure systems over oceans, which play a crucial role in directing wind patterns. The movement of air from high-pressure areas over oceans towards low-pressure areas over land contributes to the seasonal reversal of winds characteristic of monsoons.
- Statement 3 is correct: Topography, such as mountains, influence local wind patterns, and in the occurrence of monsoons.

19. The Periyar River, known for its scenic beauty, flows through which state of India?

- a) Kerala
- b) Maharastra
- c) Karnataka
- d) Andhra Pradesh

Ans: (a)

Explanation:

• The Periyar River flows through the state of Kerala and Tamilnadu. The Periyar River flows through the state of Kerala in southern India.

- Originating in the Western Ghats in Tamil Nadu, it covers approximately 244 kilometers, passing through districts like Idukki and Ernakulam.
- The river is dammed at various points, with the Mullaperiyar Dam forming the Periyar Lake. The region is ecologically rich, housing the Periyar Tiger Reserve.
- The river is essential for agriculture, human settlements, and is a popular tourist destination, contributing significantly to the state's water resources and economy. **So, option (a) is correct.**

20. Consider the following statements about the Chambal River:

- 1. This River is a tributary of the Yamuna.
- 2. The river originates in the Vindhya Range.
- 3. The Chambal River is known for its sanctuary that protects the Gharial and Mugger crocodiles.
- 4. This River passes through the state of Gujarat.

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

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

Ans: (c)

Explanation:

- Statement 1 is correct: The Chambal is the chief tributary of the Yamuna River and rises in the Vindhya Range just south of Mhow, western Madhya Pradesh state. From its source it flows north into southeastern Rajasthan state.
- Statement 2 is correct: The Chambal River originates in the Vindhya Range in Madhya Pradesh.
- Statement 3 is correct: The Chambal River is indeed known for its sanctuary that provides protection to the Gharial and Mugger crocodiles. The National Chambal Sanctuary, also known as the National Chambal Gharial Wildlife Sanctuary, is located along the Chambal River and spans across the states of Madhya Pradesh, Uttar Pradesh, and Rajasthan.
- Statement 4 is incorrect: The Chambal River does not pass through the state of Gujarat. It primarily flows through the states of Madhya Pradesh, Rajasthan and Uttar Pradesh.
- •

21. Consider the statements regarding the Luni River:

- 1. It is the only significant river of the Rajasthan region.
- 2. It originates in the Aravalli Range.
- 3. The Luni River flows into the Rann of Kutch.
- 4. This River is known for its perennial flow.

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

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

Ans: (b) Explanation:

- Statement 1 is incorrect: While the Luni River is significant in the context of Rajasthan, it is not the only significant river in the region. Rajasthan has other rivers such as the Sabarmati, Mahi, and Banas, though these are generally seasonal.
- Statement 2 is correct: It originates in the Pushkar valley of the Aravalli Range, near Ajmer.
- Statement 3 is correct: The Luni River flows into the Rann of Kutch only during exceptional rainfall; it does not regularly reach the Rann of Kutch.
- Statement 4 is incorrect: The River is mostly non-perennial, and its flow is highly variable. It experiences seasonal flow, primarily during the monsoon season, and is often dry in the non-monsoon months.

22. With reference to Indian Thar desert, consider the following statements:

- 1. The Luni River flows in the northern part of the desert.
- 2. Most of rivers are ephemeral.

Which of the statements given above is/are correct?

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

Ans:(b)

Explanation:

- Statement 1 is incorrect: The Luni River flowing in the southern part of the desert. It dissipates into the wastes of the northeastern part of the marsh called the Rann of Kachchh (Kutch).
- Statement 2 is correct: Most of the rivers in region are ephemeral. Low precipitation and high evaporation makes it a water deficit region. There are some streams which disappear after flowing for some distance and present a typical case of inland drainage by joining a lake or playa.

23. Arrange the following states in ascending order of their mangrove forest cover area:

- 1. West Bengal
- 2. Gujrat
- 3. Maharashtra
- 4. Odisha
- 5. Andhra Pradesh

Select the correct answer using code given below:

- a) 4-3-5-1-2
- b) 3-4-5-1-2
- c) 4-5-3<mark>-2-</mark>1

d) 4-3-5-2-1

Ans: (d) Explanation:

State	Mangroov area (In Sq. Km.)
1. West Bengal	2112
2. Gujrat	1177
3. Andhra Pradesh	404
4. Maharashtra	320
5. Odisha	251

So, option (d) is correct.

24. Consider the following statements with reference to Milk Production:

- 1. Annual milk production of India is increasing continuously for last 5 years.
- 2. Rajasthan is the highest annual milk producing state during 2021-22.

Which of the statements given above is/are correct:

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

Explanation:

- Statement 1 is correct: India continues to be the largest producer of milk in the world. Milk production during 2020-21 and 2021-22 is 209.96 million tonnes and 221.06 million tonnes respectively showing an annual growth of 5.29%. Annual milk production is continuously increasing every year for more than last 10 year.
- Statement 2 is correct: Rajasthan (15.05%) is the highest milk producing state during 2021-22 followed by Uttar Pradesh (14.93%), Madhya Pradesh (8.06%), Gujarat (7.56%) and Andhra Pradesh (6.97%).

25. Which of the below are considered appropriate methods for soil conservation in India.

- 1. Rock dam
- 2. Shelter belts
- 3. Intercropping
- 4. Contour ploughing

Select the correct answer using the code given below:

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

Ans: (d)

Explanation:

- Soil Conservation is a combination of practices used to protect the soil from degradation. Some methods of soil conservation are listed below:
- Mulching: The bare ground between plants is covered with a layer of organic matter like straw. It helps to retain soil moisture.
- Contour barriers: Stones, grass, soil are used to build barriers along contours. Trenches are made in front of the barriers to collect water.
- Rock dam: Rocks are piled up to slow down the flow of water. This prevents gullies and further soil loss.
- **Terrace farming:** Broad flat steps or terraces are made on the steep slopes so that flat surfaces are available to grow crops. They reduce surface runoff and soil erosion.
- Intercropping: Different crops are grown in alternate rows and are sown at different times to protect the soil from rain wash.
- Contour ploughing: Ploughing parallel to the contours of a hill slope to form a natural barrier for water to flow down the slope.
- Shelter belts: In the coastal and dry regions, rows of trees are planted to check the wind movement to protect soil cover.
- So, option (d) is correct.

26. Which of the following is related to CF 25?

- (a) Investment initiative for sustainable development
- (b) Nanoparticle contain cancer treatment drug
- (c) NASA quantum satellite
- (d) Clean hydrogen fuel

Ans: (a)

Explanation:

Cloud forest 25 (CF 25) initiative:

- Cloud forests are mountain tropical forests, constantly shrouded in clouds, which sit at the headwater of river basins. They capture moisture from the air providing fresh, clean water to communities and industries, including vital water flows to hydropower plants.
- Over 90 per cent of cloud forests are found in just 25 tropical developing countries ("cloud forest countries").
- Environmental problems include extreme weather phenomena, unprecedented global warming, and environmental disasters caused by increasing levels of CO2 and other toxic emissions. These led to a realization that economic growth must go hand in hand with environmental conservation. CF25 is a step in this direction.

- CF25 is an Investment Initiative to bring countries, their creditors and multilaterals organizations together to accelerate, and consolidate the progress and scale up sustainable development process. So, option (a) is correct.
- 27. Consider the following statements regarding Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):
 - 1. Convention is a non-governmental organisation, involve in protecting endangered animal and plant species.
 - 2. Its Secretariat is administered by World wide fund for nature (WWF).
 - 3. It is legally binding on the Parties.

How many of the statements given above is/are incorrect?

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

Ans: (b) Explanation:

Statement 1 is incorrect: CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species.

Statement 2 is incorrect: The CITES Secretariat is administered by UNEP and is located at Geneva, Switzerland. **Statement 3 is correct**: CITES is an international agreement to which States and regional economic organizations adhere voluntarily. States that have agreed to be bound by the Convention ('joined' CITES) are known as Parties. Although CITES is legally binding on the Parties (in other words they have to implement the Convention) it does not replace national laws.

28. Which of the following best describes the term "Arctic amplification"?

- a) Warming of Arctic twice to three times as fast as the rest of the planet.
- b) Accumulation of more ice by the Arctic
- c) Conservation efforts to protect biodiversity of arctic by the NASA
- d) Efforts to make arctic more habitable

Ans: (a)

Explanation:

- The Arctic is warming twice to three times as fast as the rest of the planet due to sea ice loss this phenomenon known as Arctic amplification.
- As sea ice declines, it becomes younger and thinner, and therefore more vulnerable to further melting. When
 the ice melts entirely, darker land or ocean surfaces can absorb more energy from the Sun, causing additional
 heating.
- Arctic amplification is driving ice sheet melt, sea level rise, more intense Arctic fire seasons, and permafrost melt. A growing body of research also shows that rapid Arctic warming is contributing to changes in mid-latitude climate and weather.
- So, option (a) is correct.
- 29. Consider the following statements with reference to the "Myristica swamps":

- 1. These have characteristics traits of dense evergreen closed forest, presence of abundant respiratory roots protruding from waterlogged soil.
- 2. These can be found along the western ghats and Andaman Nicobar Islands.

Which of the statement given above is/are incorrect?

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

Ans: (d)

Explanation:

- Statement 1 is correct: Myristica swamps are relict tropical ecosystems thought to be millions of years old. Myristica swamps are characterized by a dense evergreen closed forest, a lot of respiratory roots that emerge from wet soil, high humus content soils and year-round high moisture or flooding.
- Statement 2 is correct: These are spread across the Western Ghats in Kerala, Karnataka, Goa. A smaller distribution exists in the Andaman and Nicobar Islands.
- 30. Consider the following statements with reference to the "Protection of Plant Varieties and Farmers' Rights Act, 2001" (PPV & FR Act, 2001):
 - 1) PPV & FR Act, 2001 establishment of an effective system for protection of plant varieties, rights of farmers and plant breeders and to encourage development of new varieties of plants.
 - 2) Foreign applicants are eligible to apply for registration of their variety under PPV & FR Act, 2001.
 - 3) Plant variety can be protected under Patent Act in India.

How many of the above statements is/are correct?

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

Ans: (b)

Explanation:

- Statement 1 is correct: One of the objectives of the PPV&FR Act (2001) is establishment of an effective system for protection of plant varieties, rights of farmers and plant breeders and to encourage development of new varieties of plants.
- Statement 2 is correct: Foreign applicants are eligible to apply for registration of their variety under PPV & FR Act, 2001. The procedure for obtaining plant variety registration is same for Indian citizen and foreigners. However, foreign applicants must furnish their address though their representatives in India for service while applying for plant variety registration.
- Statement 3 is incorrect: The Patent Act of India does not accommodate protection of a pant variety through patenting of a plant or its components or parts. The PPVFRA not only protects a plant variety, it also protects the rights of plant breeders and farmers on plant varieties. The protection of a plant variety is granted in the form of registration.

31. Consider the following statements regarding Other effective area-based conservation measures' (OECMs) sites:

1. Okhla Bird sanctuary declared first OECM site of India.

2. The OECM tag is given by the International Union for Conservation of Nature (IUCN).

Select the correct answer using the options given below:

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

Ans: (b) Explanation:

- Other effective area-based conservation measures' (OECMs) are a new conservation approach, separate from protected areas, where effective in-situ conservation of biodiversity is achieved mainly as a by-product of other management.
- Statement 1 is incorrect: Aravalli Biodiversity Park in Gurugram declared as India's first OECM site.
- Statement 2 is correct: The OECM tag is given by the International Union for Conservation of Nature (IUCN) to areas that are not protected but support rich biodiversity.

32. Consider the following statements with reference to cryptobiosis:

- 1. A state of extreme inactivity in response to adverse environmental conditions.
- Examples of organisms with cryptobiotic desiccation include nematodes, brine shrimp, yeast. Which of the statement given above is/are *incorrect*?
 - (a) Only 1
 - (b) Only 2
 - (c) 1 and 2
 - (d) Neither 1 nor 2

Ans: (d)

Explanation:

Statement 1 is correct: Cryptobiosis is a state of extreme inactivity in response to adverse environmental conditions. In the cryptobiotic state, all metabolic procedures stop, preventing reproduction, development, and repair. In cryptobiosis, an organism can live almost indefinitely while it waits for environmental conditions to become better.

Statement 2 is correct: The most common type of cryptobiosis is desiccation or drying out. Examples of organisms with cryptobiotic desiccation include nematodes (roundworms), brine shrimp, the majority of plant seeds, the resurrection plant Craterostigma plantagineum, and many microorganisms, including yeast.

33. Recently Traditional Water conservation paper was released by Economic Advisory Council to Prime Minister, Consider the following pairs regarding traditional water conservation method:

State/Union tertiary	Traditional Water conservation method
1 Ladakh	Naula
2. Nagaland	Apatani
3. Arunachal Pradesh	Zabo
4. Uttarakhand	Zings

How many of the above pairs are correctly matched?

- (a) Only two
- (b) Only three

- (c) All four
- (d) None of the

Ans: (d) Explanatio

Explanation:

- Recently Traditional Water conservation paper was released by Economic Advisory Council to Prime Minister, Paper highlights need for revival of water conservation in India. There are different methods of traditional water conservation in different regions of India, such as:
- Ladakh Zings
- Nagaland Zabo, Cheo-ozihi
- Arunachal Pradesh Apatani
- Uttarakhand
- Rajasthan
 Kunds, Baolis
- Delhi
- Madhya Pradesh Talab , Chandela Tank

Naula,

Baolis

34. Which of the following can be used for 'Cloud Seeding':

- 1. Dry Ice
- 2. Silver iodide
- 3. Potassium iodide

Choose the correct answer using the options given below:

- a) only 1
- b) only 2
- c) 1, 2, and 3
- d) none

Ans: (c) Explanation:

- Cloud seeding is a weather modification technique that improves a cloud's ability to produce rain or snow by introducing tiny ice nuclei into certain types of subfreezing clouds.
- Carbon dioxide in the form of dry ice is also important in the making of artificial rain. This chemical is a colourless gas with chemical compound CO₂.
- Most cloud seeding operations use a compound called silver iodide (AgI) to aid in the formation of ice crystals.
 Silver iodide exists naturally in the environment at low concentrations, and is not known to be harmful to humans or wildlife.
- Potassium iodide is similar to silver iodide except for the fact that potassium iodide is not only for artificial rain but also for other uses. So, option (c) is correct.



35. Consider the following pairs:

Wildlife Sanctuary	State
1. Suhelva Sanctury	Orissa

- 1. Suhelva Sanctury
- 2. Simbalbara Wildlife Sanctuary Uttar Pradesh
- 3. Nandhaur Wildlife Sanctuary Uttarakhand

Select the incorrect Pairs using the options given below:

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

Ans: (a) **Explanation:**

Pair 1 is incorrect: Suhelva Sanctury located in Shravasti, Balrampur and Gonda districts of Uttar Pradesh. Suhelva was declared a Wildlife Sanctuary in 1988. A new area where photographic evidence of tigers has been recorded for the first time. Sanctuary recorded three tiger individuals in 244 km² area. These tigers did not match with the previous tigers recorded in the area.

Pair 2 is incorrect: Simbalbara Wildlife Sanctuary is located in Sirmor district, Himachal Pradesh. It was established as a wildlife reserve in 1958 and later was re-established as a sanctuary in 1974. Tiger caught on camera for first time here in February 2023

Pair 3 is correct: Nandhaur Wildlife Sanctuary is located in Nainital, Champawat and partly in Udham Singh Nagar districts of Uttarakhand state.

36. Consider the following statements:

- 1. India has two transnational Elephant corridor.
- 2. Karnataka has the highest number of identified elephant corridors in India.

Which of the statement given above is/are correct?

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

Ans: (d) **Explanation:**

- Elephant corridor is a strip of land that facilitates the movement of elephants between two or more viable habitat patches. Movement of elephants away from forest habitats into the human domain without connecting to viable habitat patches may not be considered elephant corridors
- Statement 1 is incorrect: About 84% (126) of the identified elephant corridors occur within the state boundaries. About 13% (19) are interstate elephant corridors that extend into two or more states. There were 6 transnational corridors between India and Nepal.



Figure Within state, interstate and transnational elephant corridors across India

• Statement 2 is incorrect: West Bengal has the highest number (26) of identified elephant corridors in India, accounting for over 17% of all the reported elephant corridors in the country.

37. Consider the following statements:

- 1. Daphabum is the highest mountain peak in Namdapha Tiger Reserve.
- 2. River Jia- Bhoroli crosses Manas Tiger Reserve.
- 3. Kabini River transverse the Bandipur Tiger Reserve.

How many of the above pairs is/are correctly matched?

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

Ans: (b) Explanation:

- Statement 1 is correct: Namdapha Tiger Reserve is named after the river Namdapha originating from Daphabum, the highest mountain peak in the Reserve.
- Statement 2 is incorrect: The river Jia- Bhoroli and its tributaries traverse the Nameri Tiger Reserve area.
- Statement 3 is correct: Bandipur Tiger Reserve, situated in the Mysore District of Karnataka State, was among the
 first nine Tiger Reserves established in India at the launch of Project Tiger in 1973. Major rivers that traverse the
 Bandipur Tiger Reserve are Nugu, Kabini, and Moyar.

38. Consider the following statements regarding the Great Indian Bustard (GIB).

- 1. It is critically endangered species.
- 2. It is endemic to Indian Subcontinent.
- 3. It is the State Bird of Rajasthan.
- 4. The Great Indian Bustard is listed in Schedule-I of the Wild Life (Protection) Act, 1972.

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

- a) Only one
- b) Only two
- c) Only three
- d) All Four

Ans: (d) Explanation:

- Statement 1 is correct: In 1980s, about 1,500-2,000 Great Indian Bustards were spread throughout the western half of India, spanning eleven states. However, with rampant hunting and declining grasslands, their population dwindled and in 2011 IUCN declared it as Critically endangered.
- Statement 2 is correct: Great Indian Bustard (GIB) is an agro-grassland bird endemic to the Indian Subcontinent.
- Statement 3 is correct: Great Indian bustard is the state bird of Rajasthan it is locally known as 'Godawan'. Government of Rajasthan started Project GIB to protect the bird in 2013.
- Statement 4 is correct: The Great Indian Bustard is listed in Schedule-I of the Wild Life (Protection) Act, 1972, thereby according it the highest degree of legal protection from hunting

39. In the context of environment, Belem declaration was in news recently, it is associated with which of the following:

- a) To eradicate factors responsible for Delhi pollution.
- b) To combat deforestation.
- c) To arrange a fund of \$100 million for developing countries
- d) To combat arctic amplification.

Ans: (b)

Explanation:

- The Belem Declaration released during the Amazon Summit recognises Indigenous knowledge as a condition for biodiversity conservation and calls for ensuring full and effective participation of Indigenous Peoples in decisionmaking and public policy formulation processes.
- It also commits to launching the Amazon Alliance to Combat Deforestation.
- So, option (b) is correct.

40. Recently, Microplastics has been found in human blood for first time. Microplastics can:

- 1. limit the ability of red blood cells to transport oxygen
- 2. cause changes in the intestinal microbiome
- 3. lead to various gastrointestinal symptoms including nausea, vomiting, and abdominal pain
- 4. lead to various endocrine disorders, including metabolic disorders, developmental disorders

Select the correct answer using the code given below:

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

Ans: (d)

Explanation:

- Recently, Microplastics found in human blood for first time. The discovery shows the particles can travel around the body and may lodge in organs.
- Microplastics can also affect the human body by stimulating the release of endocrine disruptors. In addition, microplastics can carry other toxic chemicals such as heavy metals and organic pollutants during adsorption, which can adversely affect the human body.
- Harmful impacts:
 - The results of cellular and animal experiments have shown that microplastics can affect various systems in the human body, including the digestive, respiratory, endocrine, reproductive, and immune systems. First, the digestive systems are affected when microplastics are ingested, and

physical irritation to the gastrointestinal tract may eventually cause inflammation, resulting in various gastrointestinal symptoms.

- Microplastics may cause changes in the intestinal microbiome, resulting in an imbalance between beneficial and harmful bacteria, which can lead to various gastrointestinal symptoms, such as abdominal pain, bloating, and changes in bowel habits.
- These toxic substances can enter the body through the gastrointestinal tract when microplastics are ingested orally, leading to various gastrointestinal symptoms including nausea, vomiting, and abdominal pain.
- Microplastics interfere with the production, release, transport, metabolism, and elimination of hormones, which can cause endocrine disruption and lead to various endocrine disorders, including metabolic disorders, developmental disorders, and even reproductive disorders.
- So, option (d) is correct.

41. Consider the following statements about TRAFFIC:

- 1. It is intergovernmental body working on wildlife trade in the context of both biodiversity conservation and sustainable development.
- 2. It is a joint program of World Wildlife Fund (WWF) and the International Union for Conservation of Nature (IUCN).

Which of the statement given above is/are correct?

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

Ans: (b)

Explanation:

- Statement 1 is incorrect: The TRAFFIC, the Wildlife Trade Monitoring Network, is a leading non-governmental organisation working on wildlife trade in the context of both biodiversity conservation and sustainable development.
- Statement 2 is correct: It is a joint program of World Wildlife Fund (WWF) and the International Union for Conservation of Nature (IUCN). It aims to ensure that trade in wild plants and animals is not a threat to the conservation of nature.

42. Consider the following statements with reference to the National Biodiversity Authority (NBA):

- 1. It is a statutory autonomous body established under the Biological Diversity Act, 2002.
- 2. Authority regulates access to India's biological resources and associated knowledge by Indians and non-Indians as well.

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

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

Ans: (c)

Explanation:

• **Statement 1 is correct**: The National Biodiversity Authority (NBA) was established by the Central Government in 2003 to implement India's Biological Diversity Act (2002). The NBA is a Statutory Body and it performs facilitative,

regulatory and advisory functions for the Government of India on issues of conservation, sustainable use of biological resources and fair and equitable sharing of benefits arising out of the use of biological resources.

• Statement 2 is correct: The Biological Diversity Act (2002) mandates the implementation of the provisions of the Act through the decentralized system with the NBA focusing on advice the Central Government on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising out of the utilization of biological resources. As part of its mandatory functions, NBA regulates access to India's biological resources and associated knowledge by Indians and non-Indians as well, for various kinds of activities, such as access for research, commercial utilization and obtaining of IPRs for the inventions based on any research or information on a biological resource obtained from India.

43. Consider the following statements regarding Green Voyage 2050 Project:

- 1. This Project is a partnership project between the Government of Norway and International Maritime organisation (IMO).
- 2. It aims to transform the shipping industry towards a lower carbon future
- 3. India is a pioneer lead country for the project.

How many of the statements given above is/are incorrect?

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

Ans: (d) Explanati

Explanation:

- **Statement 1 is correct:** The Green Voyage 2050 Project is a partnership project between the Government of Norway and International Maritime organisation (IMO) launched in May 2019.
- Statement 2 is correct: Green Voyage 2050 Project aiming to transform the shipping industry towards a lower carbon future. The global partnership is supporting developing countries, including Small Islands Developing States (SIDS) and Least Developed Countries (LDCs), in meeting their commitment towards relevant climate change and energy efficiency goals, for international shipping, through supporting the Initial IMO GHG Strategy.
- Statement 3 is correct: India has been selected as pioneer lead country for International Maritime Organization (IMO) Green Voyage2050 Project, with the objective to assist developing countries in their efforts to reduce Green House Gases (GHG) emissions from ships.

44. Consider the following statements regarding Keoladeo National Park:

- 1. Keoladeo was declared a national park in 1992.
- 2. It lies in the middle of Central Asian migratory flyway.
- 3. Wetlands of Keoladeo are natural.

How many of the statements given above is/are incorrect?

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

Ans: (b) Explanation:

- Recently, the Rajasthan state Forest Department has proposed to construct a zoo inside Keoladeo National Park, a World Heritage Site popularly known as Bharatpur bird sanctuary, to display a range of wetland species, including rhinos, water buffaloes, crocs, dolphins and exotic species.
- Statement 1 is incorrect: 'Bird Paradise' was developed in a natural depression wetland that was managed as a duck shooting reserve at the end of the 19th century. While hunting has ceased and the area declared a national park in 1982.
- **Statement 2 is correct**: Due to its strategic location in the middle of Central Asian migratory flyway and presence of water, large congregations of ducks, geese, coots, pelicans and waders arrive in the winter.
- **Statement 3 is incorrect**: Wetlands of Keoladeo are not natural, they are dependent on a regulated water supply from a reservoir outside the park boundary and on monsoon.

45. Consider the following statements regarding 'Bamboo':

- 1. It grows from sea level to 4000 m elevation.
- 2. Arunachal Pradesh has the largest area of bamboo.
- 3. Many Indian bamboo species have monocarpic flowering pattern.

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

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

Ans: (b)

Explanation:

- Statement 1 is correct: In India, bamboos are found in all the states except Kashmir. It grows from sea level to 4000 m elevation, from very high rainfall areas to areas of scant rainfall in Rajasthan
- Statement 2 is incorrect: According to the FSI report (2021), the total bamboo bearing area of the country is estimated to be 15.0 million ha. Madhya Pradesh has the largest area of bamboo (1.84 million ha), followed by Arunachal Pradesh (1.57 million ha), Maharashtra (1.35 million ha), and Odisha (1.12 million ha)
- Statement 3 is correct: Many important Indian bamboo species have a 40–50-year flowering cycle. Most of them flower and fruit only once in their lifetime. This is called monocarpic flowering. The entire clump dies after flowering and seeding. Further, it is not possible that the next flowering event can be predicted. Hence predicting the availability of seeds is a constraint in bamboos.

46. With reference to bioprospecting, Consider the following statements:

- 1. 1."Bioprospecting" is the "exploration of biodiversity for commercially valuable genetic and biochemical resources.
- 2. The biological resources include chemical compounds, genes, genome, and microorganisms.
- 3. Bioprospecting holds the potential ability to harness the usefulness of biodiversity for drug discovery.

How many of the statements given above is/are incorrect?

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

Ans: (d) Explanation:

• Statement 1 is correct: Bioprospecting is defined as a systematic and organized search for useful products derived from bioresources including plants, microorganisms, animals, etc., that can be developed further for

commercialization and overall benefits of the society. It involves "exploration of biodiversity for commercially valuable genetic and biochemical resources. " Such resources can take many forms and have already been discovered within the extracts, cells, or genomes of many organisms.

- Statement 2 is correct: Biological resources may include chemical compounds, genes, micro-organisms, macro-• organisms, and other valuable products from nature.
- Statement 3 is correct: Bioprospecting hold the potential ability to harness the usefulness of biodiversity for drug discovery. Vinblastine and vincristine have also been found effective in treating Wilms' tumor, primary brain tumors, and testicular, cervical, and breast cancers. Introduced in the 1960s by the Eli Lilly Company, these drugs derived from the rosy periwinkle have earned that company roughly \$200 million in annual revenue. Two technologies developed in the late 1990s promise to have a profound impact on the development of new drugs: genomics and combinatorial chemistry.

IUCN Conservation status

47. Consider the following Pair:

- **Species**
- Vulnerable 1. Maggar
- 2. Gharial Endangered Endangered
- 3. Saltwater Crocodile

Select the correct answer using the options given below:

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

Ans: (a) **Explanation:**

Pair 1 is correct: The Mugger is a medium-sized crocodile (maximum length 4-5 m). It is principally restricted to the Indian subcontinent where it may be found in a number of freshwater habitat types including rivers, lakes and marshes. Its IUCN Conservation status is Vulnerable. The Mugger can even be found in coastal saltwater lagoons and estuaries

Pair 2 is incorrect: The Gharial is characterised by its extremely long, thin jaws regarded as an adaptation to a predominantly fish diet. It is one of the largest of the living crocodile (males up to 6 m, and average weight of around 160 kg). Its IUCN Conservation status is Critically endangered. The Chambal River has by far the largest subpopulation of breeding Gharial in the wild.

Pair 3 is incorrect: Apart from the eastern coast of India, the saltwater crocodile is extremely rare on the Indian subcontinent. The saltwater crocodile is also found in Bangladesh. A large population is present within the Bhitarkanika Wildlife Sanctuary of Odisha while smaller populations occur throughout the Sundarbans. Its IUCN Conservation status is Least concern.



(1) Distribution of Saltwater Crocodile

(2) Gharial

(3) Maggar crocodile

48. Consider the following:

- 1. It allows to emit certain amount of carbon dioxide and other Green House Gases.
- 2. A carbon tax is usually levied per ton of greenhouse gas emissions emitted.

Select the correct answer using the options given below:

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

Ans: (c) Explanation:

- Statement 1 is correct: Carbon credits, also known as carbon offsets, are permits that allow the owner to emit a certain amount of carbon dioxide or other greenhouse gases. One carbon credit is equal to one ton of carbon dioxide.
- Statement 2 is correct: A carbon tax is a type of penalty that businesses must pay for excessive greenhouse gas emissions. The tax is usually levied per ton of greenhouse gas emissions emitted. It is designed to encourage such businesses to reduce their output of greenhouse gases and carbon dioxide, a colourless and odourless incombustible gas, into the atmosphere.
- 49. With reference to the environmental impact assessment consider the following statements:
 - 1. It is an important management tool for integrating environmental concerns in development process and for improved decision making.
 - 2. Environmental clearances based on EIA study was introduced in 1978-79 under the Indian forest act 1927.
 - 3. The environment impact assessment consists of only three steps like screening, impact analysis, decision making.

How many of the above statements is/are correct?

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

Explanation:

- Statement 1 is correct: Keeping in view the tenets of Sustainable Development, it has been realized that all developmental efforts need to be harmonized with conservation of environment and ecology. It has been experienced that Environmental Impact Assessment (EIA) is an important management tool for integrating environmental concerns in development process and for improved decision making.
- Statement 2 is incorrect: Environmental clearances based on EIA study was introduced as an administrative measure in 1978-79 and was made mandatory for 32 categories of developmental projects through EIA Notification,1994 under the Environment (Protection) Act, 1986.
- Statement 3 is incorrect: The environment impact assessment consists of eight steps with each step equally important in determining the overall performance of the project. Typically, the EIA process begins with screening to ensure time and resources are directed at the proposals that matter environmentally and ends with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. The eight steps of the EIA process are Screening, Scoping, Impact analysis, Mitigation, Reporting, Review of EIA, Decision-making, Post monitoring.

50. Consider the following statements with reference to the Compensatory Afforestation Act:

- 1. Ninty percent Compensatory Afforestation Fund is to be kept with the centre.
- 2. The Act has provisioned that CAMPA fund shall be kept in consolidated fund of India.
- 3. The fund cannot be used managing human-wildlife conflicts.

How many of the above statements is/are correct?

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

Ans: (d)

Explanation:

- **Statement 1 is incorrect**: As per the rules, 90% of the Compensatory Afforestation Fund money is to be given to the states while 10% is to be retained by the Centre.
- Statement 2 is incorrect: In 2014, Hon'ble Supreme Court permitted release of 10% of total deposit of states in the fund from interest accrued on the deposits. This Act has provisioned that CAMPA funds shall be kept in interest bearing non-lapsable Public Account.
- Statement 3 is incorrect: The funds can be used for treatment of catchment areas, assisted natural generation, forest management, wildlife protection and management, relocation of villages from protected areas, managing human-wildlife conflicts, training and awareness generation, supply of wood saving devices and allied activities.

51. Consider the following initiatives:

- 1. The International Consortium on Combating Wildlife Crime
- 2. Monitoring the illegal Killing of Elephants
- 3. Supporting Sustainable management of endangered tree species

How many of the above is/are initiatives of CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora)?

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

Ans:(c) Explanation:

- All the above three are initiatives of CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora).
- CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. It aims to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species. **So, option (c) is correct.**

52. With reference to mangroves forest, consider the following statements:

- 1. Sustainable Aquaculture in Mangrove Ecosystem (SAIME) is a community-based pilot project in West Bengal under which farmers are planting mangrove trees around shrimp ponds.
- 2. These forests can withstand freezing temperatures.

Which of the statements given above is/are correct?

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

Ans:(a) Explanation:

- Mangroves are a group of trees and shrubs that live in the coastal intertidal zone.
- Statement 1 is correct: Sustainable Aquaculture in Mangrove Ecosystem(SAIME) initiative is a community-based pilot project in West Bengal Sundarbans ,under which farmers are planting mangrove trees around shrimp ponds.
- Statement 2 is incorrect: Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures. They are also cultivating indigenous varieties of shrimps such as black tiger shrimp and giant freshwater prawns.

53. Consider the following:

- 1. Ensuring the welfare of animals
- 2. Prevention and control of pollution
- 3. Afforestation and regeneration of degraded areas

How many of the above is/are objectives of the Ministry of Environment, Forest and Climate Change (MoEFCC)?

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

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Ans:(c) Explanation:

The Ministry of Environment, Forest and Climate Change (MoEFCC) is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing the implementation of India's environmental and forestry policies and programmes.

The broad objectives of the Ministry are:

- Conservation and survey of flora, fauna, forests and wildlife
- Prevention and control of pollution
- Afforestation and regeneration of degraded areas
- Protection of the environment and
- Ensuring the welfare of animals
- So, option (c) is correct

54. With reference to artificial reef (AF), Consider the following statements:

- 1. AF of building rubble and rocks were used in Japan to grow kelp.
- 2. AF are used a tool for fisheries management in maximizing resource enhancement.

Which of the statements given above is/are correct?

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

Ans:(c) Explanation:

• Statement 1 is correct: During the 1600s artificial reefs of building rubble and rocks were used in Japan to grow kelp.

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• Statement 2 is correct: Artificial reef are used as a possible tool for fisheries management in maximizing resource enhancement, resource conservation, habitat rehabilitation and mitigation as well as one of the steps to alleviate the problem of depleting fish resources in the coastal waters.

55. With reference to Greenwashing, consider the following statements:

- 1. It conveys a false impression that a company or its products are environmentally friendly.
- 2. It attempts to capitalize on the growing demand for environmentally sound products.

Which of the statements given above is/are correct?

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

Ans:(c) Explanation:

• Statement 1 and 2 are correct: Greenwashing is the process of conveying a false impression or misleading information about how a company's products are environmentally sound. Greenwashing involves making an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly or have a greater positive environmental impact than they actually do.

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56. Consider the following:

- 1. Mangrove forests
- 2. Marshlands
- 3. Estuaries
- 4. River bank

Which of the given above are examples of ecotone?

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

Ans: (d) Explanation:

- Ecotone is a zone of junction between two or more diverse ecosystems.
- Examples of ecotone:
 - ✓ Mangrove forests represent an ecotone between marine and terrestrial ecosystems.
 - ✓ Grasslands represent an ecotone between desert and forest.
 - ✓ Estuaries represent the ecotone between saltwater and freshwater.
 - ✓ Marshlands represent an ecotone between dry and wet ecosystems.
- So, option (d) is correct.

57. Consider the following statements:

- 1. The pyramid of numbers is always upright.
- 2. The pyramid of biomass may be upright or inverted.
- 3. The pyramid of energy is always upright.

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

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

Ans: (b) Explanatio

Explanation:

- Statement 1 is incorrect: Depending upon the size and biomass, the pyramid of numbers may not always be upright, and may even be completely inverted.
- Statement 2 is correct: For most ecosystems on land, the pyramid of biomass has a large base of primary producers with a smaller trophic level perched on top. In contrast, in many aquatic ecosystems, the pyramid of biomass may assume an inverted form.
- Statement 3 is correct: An energy pyramid reflects the laws of thermodynamics, with the conversion of solar energy to chemical energy and heat energy at each trophic level and with loss of energy being depicted at each transfer to another trophic level. Hence the pyramid is always upward, with a large energy base at the bottom.

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58. Consider the following:

- 1. Increased productivity
- 2. Increased diversity of organisms
- 3. Gradual decrease in the complexity of food webs

Which of the given above is/are characteristics of ecological succession?

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

Ans: (a) Explanation:

- Ecological Succession is characterized by the following:
 - ✓ increased productivity
 - ✓ the shift of nutrients from the reservoirs
 - ✓ increased diversity of organisms with increased niche development

- ✓ a gradual increase in the complexity of food webs
- So, option (a) is correct.

59. With reference to the Eutrophication, consider the following statements:

- 1. It is a syndrome of ecosystem, response to the addition of artificial or natural nutrients.
- 2. It is primarily caused by the leaching of phosphate.
- 3. It leads to the degradation of aquatic ecosystem.

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

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

Ans: (c)

Explanation:

- Statement 1 is correct: Eutrophication is a syndrome of ecosystem, response to the addition of artificial or natural nutrients such as nitrates and phosphates through fertilizer, sewage, etc that fertilize the aquatic ecosystem.
- Statement 2 is correct: Eutrophication primarily caused by the leaching of phosphate and nitrate-containing fertilisers from agricultural lands into lakes or rivers.
- Statement 3 is correct: This eventually leads to degradation of aquatic ecosystem and death of its organisms.

60. Consider the following statements regarding Leopards:

- 1. Species originated in the Ethiopian realm.
- 2. They are listed in Appendix II of CITES
- 3. The National Tiger Conservation Authority conducts a national level assessment of the species.

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

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

Ans: (b) Explanation:

- Statement 1 is correct: Unlike tigers that colonized India from the East (Malayan realm), like lions, leopards originated in the
 - Ethiopian realm and entered into India from the Western corridor much earlier than lions and tigers.
 - Statement 2 is incorrect: Leopard is also listed in Appendix I of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) and in Schedule I of the Wildlife (Protection) Act 1972 in India providing it with the highest level of protection.
 - Statement 3 is correct: The National Tiger Conservation Authority (NTCA) in collaboration with the State Forest Departments and conservation NGOs and coordinated by the Wildlife Institute of India (WII), conducts a national level assessment of "Tigers, Co-predators, Prey and their Habitat" every four years since 200For species besides tigers and leopards, the past assessments were mostly limited to occupancy.

61. Which of the following may cause sea level rise?

- 1. Thermal expansion of water
- 2. Melting of ice sheets, glaciers and ice caps

- 3. Changes in the net storage of terrestrial freshwater
- 4. Rebounding of earth crust
- 5. Vertical land motion

Select the correct answer using the code given below:

- a) Only 1, 2 and 3
- b) Only 1, 2, 3 and 4
- c) Only 1, 2, 3 and 5
- d) 1, 2, 3, 4 and 5

Ans: (d) Explanation:

- Cause of sea level rises
 - ✓ Most of the observed sea-level rise (about 3 mm per year) is coming from the meltwater of land-based ice sheets and mountain glaciers, which adds to the ocean's volume (about 2 mm per year combined), and from thermal expansion, or the ocean water's expansion as it warms (roughly 1 mm per year).
 - Changes in land-water storage (e.g., water stored behind dams or withdrawn from underground aquifers, changes in global precipitation patterns and torrential rainfalls) also make a small contribution.
 - Scientists also factor in vertical land motion changes due to subsidence and/or the rebounding of Earth's crust since the end of the Last Glacial Maximum. So, option (d) is correct.

62. Consider the following statements about the Cartagena Protocol on Biosafety:

- 1. It is an additional agreement to the Convention on Biological Diversity.
- 2. It establishes procedures for regulating the import and export of Living Modified Organisms (LMOs).
- 3. India is a party to the Cartagena Protocol.

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

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

Ans (c) Explanation:

- Statement 1 is correct: The Cartagena Protocol is a supplementary agreement to the United Nations Convention on Biological Diversity (CBD).
- Statement 2 is correct: A Living Modified Organism (LMO) is defined in the Cartagena Protocol on Biosafety as any living
 organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology. The
 Protocol requires Parties to ensure that LMOs being shipped from one country to another are handled, packaged, and
 transported safely.
- Statement 3 is correct: India is a party to the Cartagena Protocol. India ratified it on January 23, 2003.

63. Consider the following statements about The Wildlife (Protection) Act of 1972:

- 1. The Act came as a result of the Stockholm conference.
- 2. As per the Act, the state governments have the power to declare a wild animal as vermin.

Which of the statements given above is/are correct?

- a) Only 1
- b) Only 2

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

Ans- (a) Explanation:

- Statement 1 is correct: The Stockholm conference was held in the year 1972 which was for wildlife conservation and environmental concerns across the globe. On 5th June 1972, the environment was first discussed as an item of international agenda at the U.N. Conference of Human Environment in Stockholm. The Wildlife (Protection) Act of 1972 came as a result of the Stockholm conference. India became the first country in the world to have made provisions for the protection and conservation of the environment in its constitution.
- Statement 2 is incorrect: With the amendment of the Act in 1991, the powers of the State Governments to declare any wild animal vermin were withdrawn. The central government can "declare any wild animal other than those specified in Schedule I and Part II of Schedule II to be vermin for any area.

64. Which among the following term is used for sugar industry waste produced from the filtration of the cane juice?

- a) Bagasse
- b) Molasses
- c) Drilling mud
- d) Press mud

Ans: (d) Explanation:

- Press mud is the compressed sugar industry waste produced from the filtration of the cane juice. It is a good source of fertilizer.
- In sugar manufacturing three important by-products are –

Press Mud	Bagasse	Final Molasses
Press mud is the residual output after	Bagasse is the fibrous matter that	Final molasses is the dark colour and
the filtration of	remains after sugarcane are crushed	thickly syrup from
the muddy juice. It is also known as	to extract the cane juice in mill house	the final stage of crystallization, from
Filter Cake	of	which no more sugar can be obtained
or Press Cake or Mud.	tsugar factory.	by further crystallization.

65. With reference to White hydrogen, Consider the following statements:

1. It causes less CO₂ emissions when used as a fuel.

2. It is rarely found and cannot be renewable.

Which of the statements given above is/are correct?

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

Ans: (d) Explanation:

White hydrogen is a naturally occurring found in underground deposits. It has several advantages over other types of hydrogen, such as green, grey, brown, or black hydrogen, which are obtained from different sources and methods.

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• Statement 1 is incorrect: White hydrogen causes no CO2 emissions when used as fuel.

• Statement 2 is incorrect: It is abundant and renewable in nature. It is cheaper and more efficient than steam reforming or electrolysis.

66. With reference to Gucchi Mushroom, Consider the following statements:

- 1. It is rich in anti-oxidant, vitamins.
- 2. It is found in Himachal Pradesh, Uttarakhand and Jammu and Kashmir.

Which of the statements given above is/are correct?

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

Ans:(c)

Explanation:

- Guchhi mushroom is a species of fungus in the family Morchellaceae of the Ascomycota. They are pale yellow in colour with large pits and ridges on the surface of the cap, raised on a large white stem.
- Statement 1 is correct: It cannot be cultivated commercially and grow in conifer forests across temperate regions, and the foothills in Himachal Pradesh, Uttarakhand, and Jammu and Kashmir.
- Statement 2 is correct: These mushrooms are also replete with health benefits. They are rich in potassium, vitamins and copper. They are also a rich source of vitamin D apart from several B-vitamins.

67. Consider the following statements about the National Mission for Clean Ganga (NMCG):

- 1. It was registered as a society under the Societies Registration Act 1860
- 2. The mission involves de-siltation of the river.
- 3. It aims to increase the groundwater recharge in the flood prone area.

Which of the statements given above is/are correct?

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

Ans (d)

Explanation:

- Statement 1 is correct: National Mission for Clean Ganga (NMCG) was registered as a society on 12th August 2011 under the Societies Registration Act 1860.
- Statement 2 is correct: The mission involves de-siltation of the river to increase the volume of flow or hydraulic flow in the river.
- Statement 3 is correct: The increase in hydraulic flow will automatically lead to increase the groundwater recharge in the floodplain area.
- 68. Recently, Sikkim witnessed the phenomenon of Glacial Lake Outburst Floods (GLOFs). In this context, consider the following statements:
 - 1. GLOFs occur mainly due to failures of moraine dams.
 - 2. GLOFs in the Third Pole region have increased over the last few decades.
 - 3. GLOF in Sikkim was the first of its kind in the Indian Himalayan region.

Which of the statements given above are correct?

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

Ans (a)

Explanation:

- Statement 1 is correct: A glacial lake outburst flood (GLOF) is defined as a sudden release of a significant amount of water
 retained in a glacial lake. The phenomenon occurs mainly due to failures of moraine dams. Moraine dams are usually located
 downslope from steep glaciers and vertical rock slopes. Dam failures are mainly triggered by the build-up of water pressure,
 ice and rock avalanches, earthquakes, erosion, and other natural disruptions.
- Statement 2 is correct: The region that encompasses the Hindu Kush Himalayas Mountain range and the Tibetan Plateau is widely known as the Third Pole because its ice fields contain the largest reserve of freshwater outside the polar regions. Occurrences of GLOFs in the Third Pole region have increased from 1.5 events annually during 1981-1990 to 2.7 events during 2011-2020 due to climate change.
- Statement 3 is incorrect: In the Indian Himalayan region, the first GLOF was reported in 1926 in Jammu and Kashmir. It was the flood caused by the Shyok glacier in Jammu and Kashmir. The recent event of GLOF in Sikkim was due to burst in the South Lhonak Lake. This caused the rise of water levels in the Teesta River that flooded at least four districts.

69. Invasive species are one of the major threats to biodiversity, which of the following are invasive species in India:

- 1. Carrot grass
- 2. Mesquite
- 3. Wild tamarind
- 4. Water hyacinth
- 5. Black wattle

Select the correct answer using the code given below:

- a) Only 1, 3 and 4
- b) Only 1, 2, 3 and 4
- c) Only 1, 2, 3 and 5
- d) 1, 2, 3, 4 and 5

Ans:(d) Explanation:

An invasive species is an organism that is not indigenous, or native, to a particular area. Invasive species can cause great economic and environmental harm to the new area. To be invasive, a species must adapt to the new area easily. It must reproduce quickly. It must harm property, the economy, or the native plants and animals of the region.

- Carrot grass (Parthenium hysterophorus): It is a native of the American tropics, Carrot grass invades a wide variety of landscapes. It successfully grows in pastures, farmlands, rice fields and forests. It causes disastrous loss of yield of crops, affects livestock and human health. It is believed to have entered India as a contaminant through imported wheat.
- Wild tamarind (Leucaena leucocephala): This nitrogen-fixing tree is one of the world's worst invasive species. In India, urban municipalities promoted it for afforestation as it grows rapidly. The tree also provides firewood and fodder. Originating from Central America, it hinders the growth of native plants.
- **Mesquite (Prosopis juliflora):** This is a thorny shrub native to Mexico, South America and the Caribbean. After the Europeans introduced it to Asia and Australia, this plant is now destroying grasslands and causing soil erosion in many parts of the world. In Kannada, it is called 'ballari jaali'.
- Black wattle (Acacia mearnsii): Many species of acacia, including Acacia mearnsii, are endemic to Australia. Today, they are widely grown in India for timber and firewood. Acacia plantations in the Western Ghats are known to replace native plants of the Shola grasslands. In riparian zones, the acacia plants increase water loss.

- Water hyacinth (Eichhornia crassipes): A native of the Amazon basin of South America, the British introduced this aquatic plant into India for its beautiful flowers. It grows rapidly, suppressing native plants, blocking waterways and reducing dissolved oxygen in the water. Local communities use the roots of the plant to weave baskets. The plant can also be used to treat heavily polluted waterbodies.
- So, option (d) is correct.

70. Which of the following are the reasons/factors for exposure to lead pollution?

- 1. Petrol and Diesel
- 2. Lead batteries
- 3. Paints
- 4. Hair dye products
- 5. Toys and jewellery

Select the correct answer using the code given below:

- a) Only 1, 2 and 3
- b) Only 2 and 4
- c) Only 1, 3 and 4
- d) 1, 2, 3, 4 and 5

Ans:(d) Explanation:

Lead is a naturally occurring toxic metal found in the Earth's crust. Exposure to lead can affect multiple body systems and is particularly harmful to young children and women of child-bearing age. It can cause nervous system damage and digestive problems and, in some cases, cause cancer. Major sources of lead pollution exposure:

- Petro and Diesel
- Lead batteries
- Paints
- Hair dye products
- Certain water pipes may contain lead.
- Lead can be found in some products such as toys and jewellery.
- Lead is sometimes in candies or traditional home remedies.
- So, option (d) is correct.
- 71. Consider the following statements regarding Snow Leopard:
 - 1. They are usually solitary.
 - 2. China contains as much as 60% of its habitat.
 - 3. Adaption of enlarged nasal cavity helps in living in high altitudes.

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

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

Ans: (c) Explanation:

• Statement 1 is correct: Snow leopards are usually solitary, except when females are raising cubs. Mating occurs in late winter

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• Statement 2 is correct: Snow leopards live throughout the mountains of Central Asia in Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan. Snow leopard range covers 2 million square kilometers, about the size of Greenland or Mexico, but is spread across twelve countries. China contains as much as

60% of snow leopard habitat. The cats have already disappeared from some areas where they formerly lived, such as parts of Mongolia.

- Statement 3 is correct: Adaptations of snow leopard for life in cold regions
 - \checkmark Thick Furry tail for wrapping around body and face
 - ✓ Enlarged nasal cavity
 - ✓ Long fur with wooly undergrowth

72. Consider the following statements regarding Purple Frog:

- 1. It is endemic to Northeast India.
- 2. It prefers damp and well-aerated soil.

Which of the statements given above is/are correct?

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

Ans: (b)

Explanation:

- Statement 1 is incorrect: The purple frog/Mahabali Frog, also known as Pignose frog, was first discovered in October 2003 in the Idukki district of Kerala by S.D. Biju. It is endemic to the Western Ghats in India and was not noticed until recently as it remains underground most of the year except for 2-3 weeks during the monsoon when it comes out to mate.
- Statement 2 is correct: Purple frog is a burrow-dwelling frog prefers loose, damp and well-aerated soil close to ponds and ditches or streams. This makes it convenient for adults to come out to mate during the monsoon and the females lay eggs in the water bodies. Only 135 individuals of this species are known, of which only 3 are females.

73. Consider the following statements regarding Seagrass.

- 1. They grow in deep water with a lack of salinity.
- 2. Major seagrass occurs along the southeast coast of Tamil nadu.
- 3. Dugong depend on sea grass for food.

Which of the statements given above is/are correct?

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

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Ans: (c) Explanation:

- Statement 1 is incorrect: Seagrass in shallow coastal water with sandy muddy bottoms requires comparatively calm areas.
- Statement 2 is correct: The rich growth of seagrass along the Tamilnadu coast and Lakshadweep islands due to high salinity.
- Statement 3 is correct: Dugong is a mammal dependent on sea grass for food.

74. Which of the following are examples of Quantitative pollutants?

- 1. Sulphur dioxide
- 2. Nitrogen oxide
- 3. Herbicides
- 4. Fungicides

Select the correct answer using the code given below.

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

Ans:(a)

Explanation:

- According to their existence in nature pollutants can be classified into:
- Quantitative Pollutants: These occur in nature and become pollutants when their concentration reaches beyond a threshold \checkmark level. E.g. carbon dioxide, nitrogen oxide, Sulphur dioxide.
- \checkmark Qualitative Pollutants: These do not occur in nature and are human-made. E.g. fungicides, herbicides, DDT etc.
- \checkmark So, option (a) is correct.

75. Recently a new species of epiphytic plant, Lysionotus namchoomii, discovered from which of the Indian state?

- Meghalaya a)
- b) Arunachal Pradesh
- c) Assam
- Nagaland d)

Ans:(b)

- **Explanation:**
 - Statement 1 is incorrect: There are several ways of removing particulate matter (solid particles or liquid droplets); the most widely used of which is the electrostatic precipitator, which can remove over 99 percent of particulate matter present in the exhaust from a thermal power plant.
 - Statement 2 is correct: Electrostatic Precipitators function by electrostatically charging particles in the gas stream. The charged particles are attracted to and deposited on plates or other collection devices. The treated air then passes out of the precipitator and through a stack to the atmosphere.

76. Which of the following countries do not share border with the Mediterranean Sea?

- 1. Tunisia
- 2. Saudi Arabia
- 3. Jordan
- 4. Serbia
- 5. Bulgaria

Select the correct answer using the code given below:

- a) Only 1, 2, 4 and 5
- b) Only 2, 3, 4 and 5
- c) Only 2, 3 and 4
- d) 1, 2, 3, 4 and 5

Ans (b)

Explanation:

The Mediterranean Sea is bordered by 21 countries. They are Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria, Tunisia, and Turkey. The other countries mentioned in the question do not share a border with the Mediterranean Sea. So, option (b) is correct.

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77. Which indigenous tribe resides in the Amazon rainforest of South America?

- a) Inuit
- b) Yanomami
- c) Apache
- d) Maori

Ans (b)

Explanation:

- The indigenous tribe that resides in the Amazon rainforest of South America is the Yanomami.
- The Yanomami are a well-known indigenous tribe native to the Amazon rainforest, primarily inhabiting the border regions of Brazil and Venezuela.
- They are one of the largest and most isolated indigenous tribes in South America.
- The Yanomami people are known for their unique cultural practices, traditional ways of life, and their deep connection to the rainforest. So, option (b) is correct.

78. With reference to the Uranium reserves in the world, consider the following statements:

- 1. Niger has Africa's highest-grade Uranium reserves.
- 2. Kazakhstan is the largest producer of Uranium in the world.
- 3. Narigan mine is situated in Australia.

How many statements given above is/are correct?

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

Ans (b)

Explanation:

- Statement 1 is correct: Niger is the world's seventh-biggest producer of uranium. Recently, it was in the news due to the coup in the country and its possible impact on the nuclear energy capacity of European countries, especially France. Niger, which has Africa's highest-grade uranium ores, produced 2,020 metric tons of uranium in 2022, about 5% of world mining output.
- Statement 2 is correct: About two-thirds of the world's production of uranium from mines is from Kazakhstan, Canada and Australia. In 2022 Kazakhstan produced the largest share of uranium from mines (43% of world supply), followed by Canada (15%) and Namibia (11%).
- Statement 3 is incorrect: Iran recently started the exploitation of its biggest nuclear reserve in Narigan. It is estimated to hold 650 tons of Uranium and 4600 tons of Molybdenum.

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79. Consider the following countries:

- 1. Niger
- 2. South Sudan
- 3. Nigeria
- 4. Chad
- 5. Mali

In which of the above country the Sahara Desert is spread over?

- a) Only 1, 2, 4 and 5
- b) Only 2, 3, 4 and 5
- c) Only 1, 4 and 5
- d) 1, 2, 3, 4 and 5

Ans (c)

Explanation:

The Sahara is a desert spanning North Africa. It is the largest hot desert in the world and the third-largest desert overall, smaller only than the deserts of Antarctica and the northern Arctic. The Sahara covers large parts of Algeria, Chad, Egypt, Libya, Mali, Mauritania, Morocco, Niger, Western Sahara, Sudan and Tunisia. Sahara Desert is not spread in Nigeria and South Sudan. So, option (c) is correct.

80. Consider the following statements regarding the Shale reserves across the globe:

- 1. Vaca Muerta is a shale production site in Venezuela.
- 2. China's Sichuan project is an ultra-deep drilling project to reach the shale gas reserves.
- 3. The USA has the largest estimated shale reserves in the world.

How many of the statement given above is/are correct?

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

Ans (a)

Explanation:

- Statement 1 is incorrect: Recently, Vaca Muerta, which is a shale formation that rivals the United States' Permian Basine was • in the news due to being at risk due to infrastructural bottlenecks. The formation, in Argentina's Patagonian south, is the size of Belgium. It holds the world's second-largest shale gas reserves and the fourth-largest shale oil deposits. It could become a key global supplier of gas as the world looks for alternatives to Russia, whose energy industry has been heavily sanctioned over its invasion of Ukraine.
- Statement 2 is correct: Sichuan has some of China's largest shale gas reserves. The Sichuan project, which is drilling more than . 10,000 meters deep into the earth, aims to find ultra-deep reserves of natural gas. Ultra-deep wells, which are more than 9,000 meters deep, are considered to be the most technically challenging drilling projects in the oil and gas engineering industry.
- Statement 3 is incorrect: The largest estimated resources of shale gas are in China (31.6 tcm), followed by Argentina (22.7 . tcm), Algeria (20 tcm), the United States (17.6 tcm) and Canada (16.2 tcm). In Europe the largest estimated resources lie in Poland (4.1 tcm) and France (3.9 tcm), with 0.7 tcm for the United Kingdom.

81. Consider the following pairs:

Dam

Country Pakistan

- 1. Tarbela Dam
- 2. Bratsk Dam
- 3. Grand Coulee Dam

How many of the pairs given above is/are correctly matched?

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

Ans (b)

Explanation:

Pair 1 is correct: The Tarbela Dam is one of the largest earth-filled dams in the world and a crucial water resource infrastructure • in Pakistan. Tarbela Dam is located on the Indus River in the Haripur District of the Khyber Pakhtunkhwa province of Pakistan

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Pair 2 is correct: The Bratsk Dam is a large hydroelectric dam located in Siberia, Russia. It is situated on the Angara River in the Irkutsk Oblast of Siberia, Russia.

- Russia United Kingdom

• **Pair 3 is incorrect:** The Grand Coulee Dam is a massive concrete gravity dam located in the state of Washington, USA. It is situated on the Columbia River in the northeastern part of the state of Washington.

82. Consider the following statements:

- 1. S-wave moves faster than P-wave.
- 2. S-waves are similar to sound waves.
- 3. S-waves is that they can travel only through solid materials.
- 4. P-wave travel through gaseous, liquid, and solid materials.

How many of the above is/are correct?

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

Ans (b)

Explanation:

- Statement 1 is incorrect: P-waves move faster and are the first to arrive at the surface. These are also called primary waves.
- Statement 2 is incorrect: The P-waves are similar to sound waves.
- Statement 3 is correct: S-waves can travel only through solid materials.
- Statement 4 is correct: P-wave travel through gaseous, liquid, and solid materials.

83. Consider the following pairs regarding various types of volcanoes:

LIST I	
Shield volcanoes	Become explosive if somehow water gets into the vent
Composite volcanoes	Most explosive of the earth's volcanoes
Caldera	Eruptions of cooler and more viscous lavas than basalt.

How many of the above pairs is/are incorrect?

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

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Ans (b)

Explanation:

- **Pair 1 is correct:** Barring the basalt flows, the shield volcanoes are the largest of all the volcanoes on the earth. They become explosive if somehow water gets into the vent.
- Pair 2 is incorrect: Composite Volcanoes are characterized by eruptions of cooler and more viscous lavas than basalt.
- Pair 3 is incorrect: Caldera is the most explosive of the earth's volcances. They are usually so explosive that when they erupt, they tend to collapse on themselves rather than building any tall structure.

84. Consider the following statement regarding Coffee production in India:

- 1. India produces both Robusta and Arabica varieties.
- 2. Tamil Nadu is the largest coffee- producing state in India.

Which of the statements given above is/are correct?

a) Only 1

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

Ans (a)

Explanation:

- Statement 1 is correct: The two main varieties of coffee viz., Arabica and Robusta are grown in India. Arabica is mild coffee, but the beans being more aromatic, it has a higher market value compared to Robusta beans. The cool and equable temperature, ranging between 15 degrees C to 25 degrees C, is suitable for Arabica while for Robusta, a hot and humid climate with temperatures ranging from 20 degrees C to 30 degrees C is suitable.
- Statement 2 is incorrect: In India, coffee is traditionally grown in the Western Ghats spread over Karnataka, Kerala, and Tamil Nadu. Coffee cultivation is also expanding rapidly in the non-traditional areas of Andhra Pradesh and Odisha as well as in the North East states. Karnataka is the largest producer of coffee with 70% of India's total production. Kerala and Tamil Nadu are the second and third largest producers respectively. Nearly half of Tamil Nadu's coffee is produced in the Nilgiri District where Arabica is grown.

85. Consider the following statements regarding Saffron cultivation in India:

- 1. India is the second largest saffron cultivator in the world.
- 2. Kashmir saffron has a GI status in India.
- 3. Saffron is a perennial plant.

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

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

Ans (c)

Explanation:

- Statement 1 is correct: Though, India occupies the 2nd largest area but produces approximately 7 percent of the total world production.
- Statement 2 is correct: In September 2019, Kashmir's saffron got a GI tag, which became a game-changer in maintaining its quality.
- Saffron in J&K is primarily cultivated in four districts (Pulwama, Budgam, Srinagar, Kishtwar) with 86% saffron farming system in the heritage site of Pampore over 3200 hectares.
- Statement 3 is correct: Saffron (Crocus sativus L.) is a perennial herb that belongs to the Iris family Iridaceae and is the most expensive spice in the world known for its aroma and colour and is used for flavouring and colouring and in medicinal, and pharmaceutical industries.
- Due to its very high crocin content and rich aroma, the Kashmir saffron is famous worldwide and commands a premium price over the saffron available from Spain or Iran. The red tip of the saffron strand is the costliest, because of its colour intensity, flavour and fragrance.
- Iran, India, Spain and Greece are the major saffron-producing countries with Iran occupying the maximum area and contributing about 88% of the world's saffron production.

86. Consider the following statements regarding the weathering:

- 1. It describes the breaking down or dissolving of rocks and minerals on the surface of the Earth.
- 2. Weathering of rocks helps in the enrichment of certain valuable ores.
- 3. Exfoliation is one of the effects of the weathering.

How many of the above statements is/are correct?

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

Ans (c)

Explanation:

- **Statement 1 is correct:** Weathering describes the breaking down or dissolving of rocks and minerals on the surface of the Earth. Water, ice, acids, salts, plants, animals, and changes in temperature are all agents of weathering.
- Statement 2 is correct: Weathering of rocks and deposits helps in the enrichment and concentrations of certain valuable ores of iron, manganese, aluminum, copper, etc., which are of great importance for the national economy. Weathering is an important process in the formation of soils
- Statement 3 is correct: Exfoliation is a result but not a process. Flaking off of more or less curved sheets of shells from over rocks or bedrock results in smooth and rounded surfaces.

87. Consider the following statements:

- 1. Statement 1: The troposphere is thicker at the equator and comparatively thinner at the Poles.
- 2. **Statement 2:** Heat difference on Earth's surface cause the convectional currents to rise at greater heights at warmer places.

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

- a) Both Statement 1 and Statement 2 are correct, and Statement 2 is the correct explanation for Statement 1.
- b) Both statement 1 and Statement 2 are correct, but Statement 2 is not the correct explanation for Statement 1.
- c) Statement 1 is correct, but Statement 2 is not correct.
- d) Statement 1 is not correct, but Statement 2 is correct.

Ans (a)

Explanation:

- The troposphere is the lowermost layer of the atmosphere. Its average height is 13 km and extends roughly to a height of 8 km near the poles and about 18 km at the equator.
- The troposphere is thickest at the equator, and much thinner at the North and South Poles because equator is warmer, and heat is transported to great heights by strong convectional winds.
- It is because warm air has the tendency to rise and expand. Thus, convection winds transport heat to greater heights at the equator than the poles due to heat difference on Earth. This also implies that the warmer the weather, the thicker is the troposphere. So, option (a) is correct.

88. Consider the following statements regarding the Earthquake Waves:

- 1. P-Waves are the primary waves that can move through solids, liquids and gases.
- 2. S-Waves can move through liquids only and reach the Earth's surface earlier than P- Waves.
- 3. Body waves are generally much more destructive than the surface waves.

How many of the above given statements are correct?

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

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Explanation:

Ans (a)

- **Statement 1 is correct:** P-waves, also known as primary waves, exhibit higher speed and reach the surface before other waves. They share similarities with sound waves and can traverse gaseous, liquid, and solid substances.
- Statement 2 is incorrect: S-waves, also known as secondary waves, exhibit a time lag as compared to the primary waves when they reach the surface. It is worth noting that S-waves can only travel through materials that are in a solid state only.

• Statement 3 is incorrect: P-Waves and S-Waves are Body Waves. Earthquake waves can be classified into two categories- Body Waves and Surface Waves. Body waves are those which are generated due to the release of energy at the focus and move in all directions travelling through the body of the earth. When the body waves interact with surface rocks, a new set of waves is generated called surface waves. These waves move along the surface. Surface waves are the last one to be recorded on a seismograph. But, Surface waves are more destructive as they cause displacement of rocks, and hence, the collapse of structures occurs.

89. Consider the following statements regarding phenomenon of cyclones:

- 1. The extra tropical cyclones have a clear frontal system which is not present in the tropical cyclones.
- 2. The tropical cyclones generally cover a larger area compared to extra tropical cyclones.

Which of the statements given above is/are correct?

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

Ans (a)

Explanation:

- The systems developing in the mid and high latitude, beyond the tropics are called the middle latitude or extra tropical cyclones. Whereas tropical cyclones are violent storms that originate over oceans in tropical areas and move over to the coastal areas bringing about large-scale destruction caused by violent winds, very heavy rainfall and storm surges. The extra tropical cyclone differs from the tropical cyclone in number of ways:
- Statement 1 is correct: The extra tropical cyclones have a clear frontal system which is not present in the tropical cyclones.
- Statement 2 is incorrect: The Extra tropical cyclones (and not the tropical cyclones) cover a larger area. They can originate over the land and sea. Whereas the tropical cyclones originate only over the seas and on reaching the land they dissipate.

90. Consider the following statements:

- 1. The seaward slope is steep and vertical while the landward slope is gentle in the Barrier Reef.
- 2. Fringing reefs are the largest, most extensive of all types of coral reefs.

Which of the above given statements is/are correct?

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

Ans (d)

Explanation:

- **Statement 1 is incorrect:** Coral reefs developed along the continental margins or along the islands are called fringing reefs. The seaward slope is steep and vertical while the landward slope is gentle in fringing reefs.
- Statement 2 is incorrect: The largest coral reefs off the coastal platforms but parallel to them are called barrier reefs. It is the largest, most extensive, highest and widest reef of all types of coral reefs.

91. Consider the following Oceanic Currents:

- 1. Humboldt Current
- 2. Labrador Current
- 3. Alaska Current
- 4. Falkland Current

How many of the above is/are the Cold Ocean Currents?

- a) Only one
- b) Only two

- c) Only three
- d) All four

Ans (c)

Explanation:

- The Humboldt Current, also called the Peru Current, is a cold oceanic current along the western coast of South America, originating from the Southern Ocean near Antarctica. It influences the local climate, fisheries, and biodiversity of Peru and Chile.
- The Labrador Current is a cold oceanic current flowing southward along the eastern coast of North America. It brings cold, nutrient-rich waters from the Arctic, impacting the climate, marine ecosystems, and fisheries of the region.
- The Alaska Current is a warm oceanic current flowing northward along the western coast of North America. It influences the coastal climate and marine ecosystems of Alaska by transporting relatively warm waters from lower latitudes.
- The Falkland Current is a cold oceanic current that flows northward along the eastern coast of South America near the Falkland Islands. It brings cold, nutrient-rich waters and supports a diverse marine ecosystem in the region. So, option (c) is correct.

92. Which one of the following is the cause for formation of Intertropical Convergence Zone (ITCZ)?

- a) The convergence of equatorial air mass with the tropical and sub-tropical air mass near equator.
- b) The intense heating of mid-latitude belt in summers.
- c) The convergence of northeast and southeast trade winds near equator.
- d) The high sea surface temperature and evaporation rate near equator.

Ans (c)

Explanation:

- The Inter Tropical Convergence Zone (ITCZ) is a low-pressure zone located around the periphery of the equator where trade winds
 from two hemispheres converge.
- This convergence zone lies more or less parallel to the equator but moves north or south with the apparent movement of the sun.
- The Intertropical Convergence Zone is formed when the trade winds of the Northern and Southern Hemispheres come together. In the northern hemisphere the northeast trade winds converge with southeast winds from the Southern Hemisphere. The point at which the trade winds converge forces the air up into the atmosphere, forming the ITCZ. **So, option (c) is correct.**

93. Consider the following pairs of Ocean Currents:

Current Types of Current

- 1. Kuroshio Current Cold Current
- 2. Oyashio Current Warm Current
- 3. Falkland Current Cold Current

How many of the above given pairs are correctly matched?

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

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Explanation:

Ans (a)

- Pair 1 is incorrect: The Kuroshio Current means "Black Current", named after the deeper blue colour of its waters, and is also known as the Japan Current. The Kuroshio is a warm water, north-flowing current, which transports warm, and tropical water northward toward the polar region.
- **Pair 2 is incorrect:** The Oyashio cold current is also known as the Kurile cold current. This cold current flows through the Bering Strait in a southerly direction and thus transports cold water from the Arctic Sea into the Pacific Ocean.

• **Pair 3 is correct:** The cold waters of the Antarctic Sea flow in the form of Falkland cold current from south to north along the eastern coast of South America up to Argentina.

94. With reference to physical geography, how do a Canyon and a Gorge differ from each other?

- 1. The Gorge has a step-like formation whereas Canyon has very steep and straight sides.
- 2. Canyons are commonly formed in sedimentary rocks whereas Gorges are formed in hard rocks.

Select the correct answer using the code given below:

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

Ans (b)

Explanation:

- Valleys are erosional landforms. They start as small and narrow rills; the rills will gradually develop into long and wide gullies; the gullies will further deepen, widen and lengthen to give rise to valleys. Depending upon dimensions and shape, many types of valleys like V-shaped valley, gorge, canyon, etc. can be recognised.
- Statement 1 is incorrect: A gorge is a deep valley with very steep to straight sides and a canyon is characterized by steep steplike side slopes and may be as deep as a gorge. A gorge is almost equal in width at its top as well as its bottom. In contrast, a canyon is wider at its top than at its bottom. In fact, a canyon is a variant of gorge.
- Statement 2 is correct: Valley types depend upon the type and structure of rocks in which they form. For example, canyons commonly form in horizontal bedded sedimentary rocks and gorges form in hard rocks.

95. Consider the following statements regarding coral reefs:

- 1. A fringing reef is a coralline platform lying close to the shore extending outwards from the mainland.
- 2. A barrier reef is separated from the coast by a much wider and deeper channel or lagoon.
- 3. Atolls are similar to barrier reefs except that they are circular in shape, enclosing a shallow lagoon.

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

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

Ans (c)

Explanation:

- Statement 1 is correct: A fringing reef is a coralline platform lying close to the shore extending outwards from the mainland. It is sometimes separated from the shore by a shallow lagoon. It is widest when fringing a protruding headland but completely absent when facing the mouth of a stream. The outer edge grows rapidly because of the splashing waves that continuously renew the supply of fresh food.
- Statement 2 is correct: The barrier reefs have narrow gaps at several places to allow the water from the enclosed lagoon to return to the open ocean. Such gaps are very useful for shipping and provide the only entrances for ships to enter or leave the lagoon. The best-known barrier reef is the Great Barrier Reef off the coast of Queensland, Australia.
- Statement 3 is correct: Atolls are similar to barrier reefs except that they are circular in shape, enclosing a shallow lagoon without any land in the center. The reef that surrounds this lagoon is usually broken in some places, which helps maintain the free flow of water. On the inside of the reefs, sand and limestone debris collect and palm trees like coconuts may grow.

96. Consider the following planets:

- 1. Venus
- 2. Mars

3. Jupiter

How many of the planets given above take more time than earth to revolve around the Sun?

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

Ans (b)

Explanation:

- Earth's orbital period, often referred to as its "year," is approximately 365.25 Earth days. This is the time it takes for Earth to complete one orbit around the Sun. Planets that orbit closer to the Sun than Earth have shorter years than Earth. Planets that orbit farther from the Sun than Earth have longer years than Earth.
- Venus: It takes Venus 224.7 Earth days to complete one orbit around the Sun, which is slightly shorter than Earth's 365.25 days.
- Mars: Mars takes 687 Earth days to complete one orbit around the Sun, significantly longer than Earth.
- Jupiter: Jupiter takes 11.86 Earth years (approximately 4,333 Earth days) to complete one orbit around the Sun, much longer than Earth. So, option (b) is correct.

97. Consider the following statements regarding the trade winds:

- 1. These are westerly winds.
- 2. They are humid and warmer in the areas of their origin.
- 3. Strong trade winds are associated with heavy precipitation.
- 4. The Southeast Asian monsoon, is a seasonal, moisture-laden trade wind.

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

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

Ans (a)

Explanation:

- Statement 1 is incorrect: The trade winds are those blowing from the sub-tropical high-pressure areas towards the equatorial low-pressure belt. Therefore, these are confined to a region between 30° N and 30° S throughout the earth's surface. They flow as the north-eastern trades in the northern hemisphere and the south-eastern trades in the southern hemisphere.
- Statement 2 is incorrect: Trade winds are descending and stable in areas of their origin (sub-tropical high-pressure belt), and as they reach the equator, they become humid and warmer after picking up moisture on their way. The trade winds from two hemispheres meet near the equator, and due to convergence, they rise and cause heavy rainfall.
- Statement 3 is incorrect: Strong trade winds are associated with a lack of precipitation, while weak trade winds carry rainfall far inland.
- **Statement 4 is correct:** The most famous rain pattern in the world, the Southeast Asian monsoon, is a seasonal, moisture-laden trade wind.

98. Consider the following statements:

- 1. The ionosphere contains electrically charged particles.
- 2. Radio waves transmitted from the earth are reflected to the earth by the ionosphere layer.

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

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

Explanation:

- Statement 1 is correct: The ionosphere is formed when particles are ionized by the Sun's energy.
- During the day, X-rays and UV light from the Sun continuously provide the energy that knocks electrons free from atoms and molecules, producing a continuous supply of ions and free electrons. At the same time, some of the ions and electrons collide and re-combine to form normal, electrically neutral atoms and molecules.
- During the day, more ions are created than are destroyed, so the number of ions in the three regions increases. At night, the recombination process takes over in the absence of sunlight, and the number of ions drops.
- Statement 2 is correct: The ionosphere also plays a role in our everyday communications and navigation systems. Radio and GPS signals travel through this layer of the atmosphere, or rely on bouncing off the ionosphere to reach their destinations. The changes in the ionosphere's density and composition can disrupt the signals.

99. Consider the following statements:

- 1. Atmospheric Density is highest near the surface of the earth and decreases with increasing altitude.
- 2. All changes in climate and weather take place in the stratosphere.
- 3. Lightning causes the production of sulfur oxide in the atmosphere.

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

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

Ans (a)

Explanation:

- Statement 1 is correct: In the atmosphere, air molecules near the surface of the earth are held together more tightly than the molecules in a higher atmosphere because of the gravitational pull of the earth on all the molecules above the surface. The higher we go in the atmosphere, the fewer the molecules, and the lower the confining force. So, in the atmosphere density decreases as altitude increases.
- Statement 2 is incorrect: All changes in climate and weather take place in the troposphere.
 Statement 3 is incorrect: Lightning causes the production of nitrogen oxide in the atmosphere.

100. Consider the following statements:

1. The average global temperature in 2022 was about 1.15°C above the 1850-1900 average.

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- 2. The middle-income G20 countries, while having lower historic responsibilities and fewer financial resources, are not found to fall short of achieving their fair share of global emissions targets.
- 3. The Antarctic ozone hole is a thinning of ozone in the stratosphere over Antarctica.

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

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

Ans (a)

Explanation:

- Statement 1 is correct: According to The World Meteorological Organization, the average global temperature in 2022 was about 1.15°C above the 1850-1900 average.
- The cooling influence of La Niña conditions over much of the past three years temporarily reined in the longer-term warming trend. But La Niña ended in March 2023 and an El Niño is forecast to develop in the coming months. Typically, El Niño increases global temperatures in the year after it develops.

- **Statement 2 is incorrect:** The middle-income G20 countries, while having lower historic responsibilities and fewer financial resources, are found to fall short of achieving their fair share of global emissions targets.
- Statement 3 is incorrect: The ozone hole is a thinning of ozone in the stratosphere over the Antarctic during spring, which occurs because of the special atmospheric and chemical conditions that exist there and nowhere else on the globe. The very low winter temperatures in the Antarctic stratosphere cause polar stratospheric clouds (PSCs) to form. Special reactions that occur on PSCs, combined with the relative isolation of polar stratospheric air, allow chlorine and bromine reactions to produce the ozone hole in Antarctic springtime.

