INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

INSTA 75 DAYS REVISION PLAN FOR UPSC CSE PRELIMS 2024

INSTA TEST: DAY - 78

SUBJECT : ENVIRONMENT

1. Which of the following factors directly affect the length and complexity of food chains in an ecosystem?

1. Energy availability
2. Primary productivity
3. Presence of decomposers
4. Nutrient cycling

Options:

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

2. Which of the following statements about the trophic levels in an ecosystem are correct?

1. Each trophic level contains organisms with similar feeding behavior.
2. Energy transfer between trophic levels is highly efficient.
3. Primary consumers occupy the second trophic level.
4. Tertiary consumers are typically at the top of the food chain.

Select the correct answer using the code given below:

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

3. Consider the following statements regarding artificial ecosystems:

1. They require human intervention for maintenance.
2. They can be completely self-sustaining without external inputs.
3. They replicate the complexity and dynamics of energy flow and nutrient cycles of natural ecosystems.

How many of the above statements are correct?

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

4. With reference to the 'Global Stocktake', recently seen in news, consider the following statements:

1. The Global Stocktake is a periodic review mechanism established under the Paris Agreement.
2. The stock take will analyze contributions and achievements of each individual country towards meeting targets set by the Paris Climate summit.

Which of the statements given above is/are correct?

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

5. Which of the following best describes 'Ecophene'?

a) A gradation from one ecosystem to another when there is no sharp boundary between the two.
b) Population which is characterized by the same genotype but different phenotype in a particular habitat.
c) An area of uniform environmental conditions providing a living place for a specific assemblage of plants and animals.
d) A zone of junction between two or more diverse ecosystems.

6. Which of the following statements about pollution sources are correct?

1. Point source pollution can be readily identified and is typically localized.
2. Diffuse pollution is easier to control and mitigate than point source pollution.
3. Urban storm water discharges are considered point source pollution.
4. Mining activities can result in both point and diffuse sources of pollution.

Choose the correct answer from the options given below:

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

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

7. Consider the following statements with regard to e-waste:

1. E-waste can be a source of polybrominated biphenyls and polybrominated diphenyl ethers, which are hazardous to human health.
2. E-waste contains valuable materials such as gold, silver, and platinum.
3. The first e-waste clinic for segregating, processing, and disposal of e-waste in India was established in Bhopal, Madhya Pradesh.

How many of the above statements is/are correct?

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

8. Consider the following:

1. Carbon dioxide (CO_2)
2. Methane (CH_4)
3. Nitrous oxide (N_2O)
4. Sulfur hexafluoride (SF_6)

Arrange the above given greenhouse gases in an ascending order with reference to their atmospheric lifetime?

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

9. With reference to Wildlife Protection (Amendment) Act, 2022, consider the following statements:

1. It seeks to increase the species protected under the law, and implement the provisions of Washington Convention.
2. The new act has removed Schedule V that dealt with vermin or animals that destroy food crops.
3. It provides for mandatory surrender of any captive animals or animal products to the Chief Wild Life Warden.
4. Compensation will be paid to the person for surrendering such items.

How many of the above are correct?

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

10. Bioprospecting is the systematic search for biochemical and genetic information in nature in order to develop commercially-valuable products for pharmaceutical, agricultural, cosmetic and other applications from:

1. Bacteria
2. Fungi
3. Plants

Select the correct answer using the code given below:

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

11. Consider the following statements about India's National Adaptation Fund for Climate Change (NAFCC):

1. NAFCC supports projects aimed at climate adaptation in sectors such as agriculture, water resources, and forestry.
2. The fund exclusively finances renewable energy projects.

Which of the above given statements is/are correct?

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

12. Consider the following statements about the implementation and applicability of the Forest Rights Act (FRA), 2006:

1. The Ministry of Tribal Affairs is the nodal

agency for its implementation.
2. The Act applies to both tribal and other traditional forest dwelling communities.
3. Rights are recognized for individuals who have resided in forests for at least two generations prior to 2005.
4. A generation is defined as a period of 25 years.

Which of the above given statements are correct?

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

13. Consider the following statements about the categories within the Coastal Regulation Zone (CRZ) 2011 notification:

1. CRZ-I includes ecologically sensitive areas like mangroves and coral reefs.
2. CRZ-II pertains to already developed areas close to the shoreline.
3. CRZ-III includes rural areas with a population density above 2161 per square kilometre.
4. CRZ-IV includes aquatic areas from the low tide line up to territorial limits.

Which of the above given statements are correct?

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

14. Consider the following statements related to Eco mark:

1. Eco mark is a certification mark issued by the Bureau of Indian Standards to products conforming to a set of standards aimed at the least impact on the ecosystem.
2. It is mandatory for companies to get Eco mark certification.

Which of the above statements is/are correct?

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

15. BSE-GREENEX measures:

a) Total market value of carbon-intensive products in the economy
b) Performance of the companies in terms of Carbon Emissions
c) International trade balance in green products
d) Movement in sovereign debt of green economies

16. Consider the following statements regarding the Invasive Plant Species:

1. More than half of India's natural systems are threatened by these species which include Lantana camara and Prosopis juliflora.
2. One of the targets in the Kunming-Montreal Global Biodiversity Framework deals with the mitigation of these species.

Which of the statements given above is/are correct?

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

17. Consider the following statements regarding the Blue Holes:

1. They are underwater sinkholes similar to the sinkholes on land.
2. They vary in depth and shape but also act as ecological hot spots.
3. They do not include corals or sponges as they inhabit the shallow waters.
4. They provide the essential interaction of the groundwater and aquifer layers.

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

(a) Only one
(b) Only two
(c) Only three

(d) All four

18. Consider the following statements regarding the Amur Leopard:

1. It lives in areas with mixed Korean pine forests and open grasslands.
2. It lives in the savannah of Africa and in the Russian Far East.
3. It is also known as the Manchurian leopard.

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

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

19. With reference to the Red Panda, consider the following statements:

1. This species is found only in Sikkim and the *Kalimpong* District of West Bengal.
2. It is the state animal of Sikkim and is listed as Endangered in the IUCN Red List.
3. It thrives best in mixed deciduous forests with dense understories of bamboo.

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

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

20. Which one of the following Organizations recently launched the Climate Promise Initiative?

(a) The United Nations Environment Programme
(b) The Climate Action Tracker Group
(c) The Environmental Defense Fund
(d) The United Nations Development Programme

21. Consider the following statements regarding the Carbon Footprint:

1. Carbon footprints are usually reported in tonnes of emissions (CO2-equivalent) per unit of comparison.
2. A product's carbon footprint includes the emissions for the given year.
3. An organization's carbon footprint includes the direct emissions that it causes and not the indirect emissions.

How many of the above statements are correct?

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

22. Consider the followings:

1. Kappad Beach
2. Pati Sonepur Beach
3. Padubidri Beach
4. Radhanagar beach
5. Ghoghla beach

How many of the above blue flag beaches are situated at the eastern coast of India?

(a) Only two
(b) Only three
(c) Only four
(d) All five

23. Consider the following statements :

1. To allow more feedstocks for production of biofuels.
2. To advance the ethanol blending target of 40% blending of ethanol in petrol to ESY 2025-26 from 2030,
3. To constitute National Biofuel Coordination Committee (NBCC).

How many of the above are the objectives of National Policy on Biofuels-2022?

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

24. Consider the following statements regarding Bioremediation technologies:

1. Windrow systems are similar to compost techniques where soil is periodically

turned in order to enhance aeration.

2. Bioventing is the process of groundwater remediation as oxygen, and possible nutrients, is injected.
3. Biosparging is a process that increases the oxygen or air flow into the unsaturated zone of the soil.

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

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

25. Consider the following statements regarding the Critical wildlife habitats (CWHs):

1. CWHs are areas inside wildlife sanctuaries, national parks and tiger reserves where people's activities like cattle grazing or collecting leaves compete with the needs of wildlife.
2. CWHs are not covered under any law of India.
3. As of December 2020, more than 100 Critical Wildlife Habitats (CWHs) have been declared in India's more than 500 protected areas.

How many of the above statements are correct?

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

26. With reference to the Methane hydrate, consider the following statements:

1. Methane hydrate is a liquid clathrate compound that traps large amounts of methane within a water crystal structure.
2. Methane hydrates are formed when methane and water combine at very high temperatures and high pressures.
3. Methane hydrates are one of the largest caches of carbon in the world.

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

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

27. Consider the following statements :

Statement-I :

Carbon fertilization decreases the rate of photosynthesis in plants

Statement-II :

Soils are a major carbon reservoir containing more carbon than the atmosphere and terrestrial vegetation.

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

(a) Both Statement-I and Statement-II are correct and Statement-II 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

28. consider the following statements regarding the Greenhouse Gas Protocol:

1. It is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions.
2. The GHG Protocol offers an internationally accepted management tool to help businesses to compete in the global marketplace and governments to make informed decisions about climate change.
3. It provides the accounting framework for nearly every GHG standard and program in the world.

How many of the above statements are correct?

(a) Only one
(b) Only two

(c) All three
(d) None

29. Consider the following statements regarding the National Tiger Conservation Authority (NTCA):

1. It is a constitutional body set up under Article 48A, under the Ministry of Environment, Forests and Climate Change.
2. It was established in 2005 following the recommendations of the Tiger Task Force.

Which of the above statements is/are correct?

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

30. Consider the following statements :

Statement-I :

The New York Declaration on Forests (NYDF) is a voluntary, legally binding political declaration that calls for global action to restore and protect forests.

Statement-II :

The NYDF provides a framework for forest action that consolidates various objectives and initiatives that drive forest restoration, sustainable use, and protection.

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

(a) Both Statement-I and Statement-II are correct and Statement-II 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

31. Consider the following about Concentrated Solar Thermal Energy Technologies (CST).

1. Under this technology, electricity is generated when concentrated sunlight, using mirrors or lenses, is converted to heat.
2. It is recorded to be more efficient in costs and useful in emissions cutting in the industrial heat process related applications, over conventional solar thermal energy generation processes.

Select the correct answer using the codes below.

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

32. Consider the following about the Joint Polar Satellite System-I (JPSS-I).

1. It will improve recognition of climate patterns that influence weather.
2. It is designed for remote sensing operations and create a Geographical Informational System (GI) based ultraviolet map of the earth.

Select the correct answer using the codes below.

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

33. Under Joint Implementation, countries with commitments are eligible to transfer and/or acquire emission reduction units (ERUs) and use them to meet part of their emission reduction target. This has been provided for under the

a) Convention on Long-Range Transboundary Air Pollution (LRTAP)
b) Kyoto Protocol
c) Montreal Protocol
d) Paris Climate Accord

34. Coalbed Methane (CBM) can be used for

1. power generation
2. compressed natural gas (CNG) auto fuel
3. feedstock for fertilisers

Select the correct answer using the codes below.

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

35. High concentrations of fluoride in ground water are common in some of the semi-arid areas of

1. Gujarat
2. Southern Punjab
3. Rajasthan

Select the correct answer using the codes below.

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

Passage 1:

For some, money is the answer. India spends 2.7% of GDP on schools, less than other developing countries, such as Brazil. Two-fifths of schools lack even electricity. But much of the budget is not spent, or is spent badly. School funding increased by 80% from 2011 to 2015, according to analysis of eight states' budgets by Geeta Kingdon of University College London, yet test scores have fallen.

36. Based on your reading of the passage, what is/are the possible reason for falling test scores?

1. Most of the education budget is not spent or is spent badly
2. Money might not be the answer to education woes

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

Examine the following statements.

I. All colours are pleasant.
II. Some colours are pleasant.
III. No colours are pleasant.
IV. Some colours are not pleasant.

Given that the Statement IV is true, what can be definitely concluded?

(a) I and II are true.
(b) I is false.
(c) II is false.
(d) II is true.

39. What is the length of train B ?

I. Length of train A is 180 m and it crosses a pole in 12 seconds.
II. The ratio of speed of train A and train B is 3 : 5. Train B crosses a 280 m long bridge in 20 seconds.

a) Only I is sufficient.
b) Either I or II is sufficient.
c) Only II is sufficient.
d) Both I and II are sufficient.

40. Find the rate of interest ?

I. The difference between CI and SI on an amount at rs.4000 for 2 years is rs.90.
II. The simple interest incurred on certain sum is rs.2400 in 4 years.

a) Only I is sufficient.
b) Only II is sufficient.
c) Either I or II is sufficient.
d) Neither I nor II is sufficient.

1. Answer: a

Explanation:

- **Energy availability is a primary determinant of food chain** length and complexity. The energy captured by primary producers is foundational, as it supports all subsequent trophic levels. More energy at the base allows for more and longer food chains.
- **Primary productivity,** specifically net primary productivity (NPP), refers to the rate at which producers (plants, algae, etc.) convert sunlight into chemical energy, minus the energy they use for respiration. High primary productivity means more energy is available to support consumers at higher trophic levels, **thus enabling longer and more complex food chains.**
- **Decomposers** are crucial for breaking down organic material and recycling nutrients, but they do not directly extend the food chain length or complexity. They support ecosystem health and nutrient availability **but do not directly contribute to the number of trophic levels.**
- **While nutrient cycling** is vital for sustaining primary productivity by ensuring nutrients are available to producers, it operates indirectly. It supports primary productivity, which in turn affects energy availability and the food chain, **but it is not a direct determinant of food chain length.**
- **Hence, option (a) is correct.**

2. Answer: c

Explanation:

- Organisms within the same trophic level have similar feeding behaviors, as they occupy the same position in the food chain and have similar dietary habits (e.g., primary consumers all eat producers). **Hence, statement 1 is correct.**
- **Energy transfer between trophic levels is actually quite inefficient.** Typically, only about 10% of the energy is passed on to the next level, with the remaining 90% being lost as heat, used for metabolic processes, or left unassimilated. **Hence, statement 2 is incorrect.**
- **Primary consumers,** which are herbivores, feed directly on primary producers (plants and algae) and **thus occupy the second trophic level. Hence, statement 3 is correct.**
- **Tertiary consumers** are carnivores that feed on secondary consumers and are often at or near **the top of the food chain. Hence, statement 4 is correct.**
- **Hence, option (c) is correct.**

3. Answer: A

Explanation:

- Artificial ecosystems, such as aquariums, gardens, and crop fields, typically need human intervention to maintain balance, provide nutrients, and control conditions. **Hence, statement 1 is correct**.
- Artificial ecosystems generally need some form of human intervention or external inputs to remain functional and balanced. They are not self-sustaining in the way natural ecosystems are. **Hence, statement 2 is incorrect.**
- Artificial ecosystems attempt to replicate natural processes, but they often do so in a simplified and controlled manner. **They do not fully replicate the complexity and dynamics of natural ecosystems.**

Hence, statement 3 is incorrect.

- **Hence, option (a) is correct.**

4. Answer: a

Explanation:

- The Global Stocktake is a periodic review mechanism established under **the Paris Agreement in 2015.** The stocktake takes **place every five years**, with the first-ever stocktake at the **UN Climate Change Conference (COP28) at the end of 2023. Hence, statement 1 is correct.**
- Implementation of the agreement by all member countries together will be evaluated every 5 years, with the first evaluation in 2023.
- **The stock take will not be of contributions/achievements of individual countries** but a collective analysis of what has been achieved and what more needs to be done. **Hence, statement 2 is incorrect.**
- **Hence, option (a) is correct.**

5. Answer: b

Explanation:

- The range of phenotypes produced by a genotype in a particular habitat. These are otherwise called ecads or morphologically-changed forms. When a species is transported to a new environment, it's first response will be to develop abilities to survive there. These differences among ecophenes and not permanent. They are just temporary variations to survive the new conditions. The body of the organism assumes that it is going to be in these new conditions for a short while only. Therefore, ecophenes from different habitats, when brought together, become similar.
- Ecophene can be explained using the following example. Suppose a European arrives in the tropics. The immediate response will be the development of melanin in his skin. Then the European becomes darker.
- **Hence, option (b) is correct.**

6. Answer: C

Explanation:

- Point source pollution comes from a specific, identifiable location, such as a pipe, ditch, or channel. Examples include effluent discharges from sewage treatment plants and industrial facilities. **Hence, statement 1 is correct.**
- **Diffuse pollution,** also known as non-point source pollution, is spread over a larger area and comes from multiple sources, such as agricultural runoff or urban storm water. **It is generally more difficult to control** and mitigate because it does not originate from a single, identifiable source. **Hence, statement 2 is incorrect.**
- Urban storm water discharges are typically **considered diffuse pollution or non-point source** because they result from rainfall or snowmelt moving over and through the ground, collecting pollutants from various sources such as roads, rooftops, and lawns before entering water bodies. **Hence, statement 3 is incorrect.**
- Mining can create point source pollution through specific discharges, such as from mine drainage pipes, and diffuse pollution through runoff and leaching of contaminants over a broader area. **Hence, statement 4 is correct.**
- **Hence, option (c) is correct.**

7. Answer: C

Explanation:

- Polybrominated biphenyls (PBBs) and

polybrominated diphenyl ethers (PBDEs) are types of brominated flame retardants used in a variety of electronic devices **to reduce the risk of fire**. These substances are added to plastics and other materials used in electronics. When e-waste is improperly handled or disposed of, these chemicals can leach into the environment, leading to potential exposure through inhalation, ingestion, or skin contact. **Hence, statement 1 is correct.**

- Electronic waste is rich in precious and rare materials. For example, mobile phones, computers, and other electronic devices contain small quantities of gold, silver, platinum, and other valuable metals. These metals are used in various components like circuit boards, connectors, and microprocessors due to their excellent conductive properties. The recovery of these metals from e-waste is not only economically beneficial but also environmentally important, as it reduces the need for mining new resources and minimizes the environmental impact of extracting and processing these metals. **Hence, statement 2 is correct.**
- In a significant step towards managing electronic waste, India's first e-waste clinic was **established in Bhopal, Madhya Pradesh.** This clinic was set up to tackle the growing problem of e-waste by providing a centralized facility for the collection, segregation, processing, and disposal of e-waste generated from household and commercial units. The clinic aims to improve the recycling and disposal practices of e-waste, reduce environmental pollution, and promote the recovery of valuable materials. The establishment of this clinic is part of broader efforts to implement effective e-waste management strategies in India, in line with the E-Waste Management Rules, 2016, which emphasize the role of authorized dismantlers and recyclers in handling e-waste responsibly. **Hence, statement 3 is correct.**
- **Hence, option (c) is correct.**

8. Answer: B

Explanation:

Greenhouse Gas (GHG)	Atmospheric Lifetime (yrs)	Global Warming Potental (GWP)
Carbon dioxide (CO_2)	50-200	1
Methane (CH_4)	12±3	21
Nitrous oxide (N_2O)	120	310
Hydrofluorocarbons (HFCs)	1.5 to 209	150 to 11,700
Perfluorocarbons (PFCs)	2,600 to 50,000	6,500 to 9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

- **Hence, option (b) is correct.**

9. Answer: b

Explanation:

- Wildlife Protection (Amendment) Act, 2022 amends the Wild Life (Protection) Act, 1972 which regulates the protection of wild animals, birds and plants. It seeks to increase the species protected under the law, and implement the **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).**
- CITES (shorter name for the Convention on International Trade in Endangered Species of Wild Fauna and Flora, **also known as the Washington Convention**) is a multilateral treaty to protect endangered plants and animals from the threats of international trade. **Hence, statement 1 is correct.**
- It seeks to reduce the number of sched-

ules from VI to IV whereby Schedule V for vermin or animals that destroy food crops will be done away with.
    - Schedule I containing animal species enjoying the highest level of protection.
    - Schedule II for animal species subject to a lesser degree of protection.
    - Schedule III for protected plant species, and
    - Schedule IV for scheduled specimens under CITES.
    - **Hence, statement 2 is correct.**
- It provides for any person **to voluntarily surrender** any captive animals or animal products to the Chief Wild Life Warden. **Hence, statement 3 is incorrect.**
- **No compensation will be paid** to the person for surrendering such items. The surrendered items become property of the State government. **Hence, statement 4 is incorrect.**
- **Hence, option (b) is correct.**

10. Answer: d

Explanation:

- Bioprospecting is defined as a systematic and organized search for useful products derived from bio resources including **plants, microorganisms, animals, etc**., that can be developed further for commercialization and overall benefits of the society.
- There are many examples of bioprospecting: The opium poppy gave us a pain reliever called morphine. The white willow tree helped us develop aspirin.
- **Hence. Option (d) is correct.**

11. Answer: a

Explanation:

- The National Adaptation Fund for Climate Change (NAFCC) is a Central Sector Scheme which was set up in the year 2015-16.
- The overall aim of NAFCC is to support **concrete adaptation activities which mitigate the adverse effects of climate change**. The activities under this scheme are implemented in a project mode.
- The projects **related to adaptation in sectors such as agriculture, animal husbandry, water, forestry, tourism etc. are eligible for funding under NAFCC. National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE). Hence, statement 1 is correct.**
- NAFCC is specifically designed for adaptation and mitigation. Adaptation projects focus on adjusting to current or expected climate change impacts and reducing vulnerability. Therefore, the NAFCC supports a wide range of **adaptation activities rather than exclusively financing renewable energy projects**. Renewable energy projects may fall under different schemes and funds dedicated to climate change mitigation. **Hence, statement 2 is incorrect.**
- **Hence, option (a) is correct.**

12. Answer: a

Explanation:

THE SCHEDULED TRIBES AND OTHER TRADITIONAL FOREST DWELLER (RECOGNITION OF FOREST RIGHTS) ACT, 2006

- **The Ministry of Tribal Affairs (MoTA)** is designated as the nodal agency for the implementation of the Forest Rights Act (FRA), 2006. MoTA is responsible for overseeing the application of the Act, ensuring that the provisions are followed, and facilitating the recognition and verification of

the rights of forest-dwelling communities. MoTA also coordinates with other relevant ministries, state governments, and local bodies to ensure effective implementation. **Hence, statement 1 is correct.**

- The FRA, 2006, **is applicable to both Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs).** STs are defined as those tribes that are specifically recognized as such in the Constitution of India. OTFDs are those who have been residing in and dependent on the forests for their livelihood for at least three generations (75 years) prior to 13 December 2005, but who may not be officially recognized as Scheduled Tribes. **Hence, statement 2 is correct.**
- The Act stipulates that rights are recognized **for individuals who have resided in forests for at least three generations** prior to 13 December 2005. **Hence, statement 3 is incorrect.**
- The FRA, 2006, explicitly defines a generation as a period of 25 years. This definition is used to determine the eligibility of Other Traditional Forest Dwellers (OTFDs) for rights under the Act. To qualify, OTFDs must demonstrate that they have primarily resided in and depended on the forest for at least three generations (75 years) before the cut-off date of 13 December 2005. **Hence, statement 4 is correct.**
- **Hence, option (a) is correct.**

13. Answer: b

Explanation:

- The coastal stretches of seas, bays, estuaries, creeks, rivers and back waters which are influenced by tidal action up to 500 meters from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL are declared "Coastal Regulation Zone" (CRZ).
- In India, the Coastal Regulation Zone (CRZ) Rules govern human and industrial activity close to the coastline, in order to protect the fragile ecosystems near the sea.
- **CRZ-I is designated for ecologically sensitive areas** and includes regions such as national parks, marine parks, sanctuaries, reserve forests, mangroves, and coral reefs. **Hence, statement 1 is correct.**
- CRZ-II includes areas that are already developed up to or close to the shoreline. These areas are within municipal limits or other legally designated urban areas that are substantially built up and provided with infrastructure like drainage and roads. **Hence, statement 2 is correct.**
- CRZ-III includes relatively undisturbed areas and rural areas. However, CRZ-III itself does not distinguish areas based on population density. **The distinction based on population density (CRZ-III A and CRZ-III B) was introduced in CRZ 2018, not CRZ 2011. Hence, statement 3 is incorrect.**
- CRZ-IV pertains to the aquatic areas from the low tide line up to the territorial limits, including tidal-influenced water bodies. **Hence, statement 4 is correct.**
- **Hence, option (b) is correct.**

14. Answer: a

Explanation:

- Eco mark is a certification mark issued by the Bureau of Indian Standards (the national standards organization of India) to products conforming to a set of standards aimed at the least impact on the ecosystem. **The marking scheme was started in 1991. Hence, statement 1 is correct.**

- It is a voluntary mark labelling consumer products as environment-friendly based on specific quality and environmental parameters. **Hence, statement 2 is incorrect.**
- **Hence, option (a) is correct.**

15. Answer: b

Explanation:

- The BSE-GREENEX on the Bombay Stock Exchange is a first of its kind benchmark index, which assess the 'carbon performance' of stocks based on purely quantitative performance based criteria. Unlike existing global indices that measure environmental performance through various scaled quantitative criteria, the BSE-GREENEX applies sector specific proprietary algorithms, developed in cutting edge research facilities, to assess energy efficiency performance of various companies based on publicly disclosed energy and financial data.
- **Hence, option (b) is correct.**

16. Answer: C

Explanation:

Invasive alien species are one of the five major direct drivers of biodiversity loss globally, alongside land and sea-use change, direct exploitation of organisms, climate change, and pollution.

More than half of India's natural systems are threatened by invasive plant species. About 66 percent of the country's natural systems are threatened with invasive species.

Statement 2 is correct: Target 6 of the recently adopted Kunming-Montreal Global Biodiversity Framework is to "eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services".

The 11 high-concern invasive plant species that showed presence in 20 states of the country included Lantana camara, Prosopis juliflora and Chromolaena odorata. **Statement 1 is correct**.

17. Answer: C

Explanation:

Statement 1 is correct: Blue holes are underwater sinkholes, similar to sink holes on land. Underwater sink holes, springs, and caverns are karst features that are scattered across Florida's Gulf continental shelf.

Statement 2 is correct They vary in size, shape and depth, but most are ecological hot spots with a high diversity of abundance of plants and animals.

Statement 3 is not correct: A blue hole can be an oasis in an otherwise barren seafloor. Blue holes are diverse biological communities full of marine life, including corals, sponges, mollusks, sea turtles, sharks, and more.

Statement 4 is correct: The seawater chemistry in the holes is unique and appears to interact with groundwater and possibly aquifer layers. This link contributes to the knowledge of carbon cycling between surface and groundwater.

18. Answer: A

Explanation:

Statement 1 is not correct: Amur leopards prefer to live in areas with mixed Korean pine and deciduous forest while avoiding open grasslands or populated areas.

Statement 2 is not correct: Unlike the savannas of Africa, in the Russian Far East, it has adapted to life in the temperate forests that make up the northern-most part of the species' range.

The Amur leopard is solitary. Nimble-footed and strong, it carries and hides unfinished kills so that they are not taken by other predators.

The Amur leopard is a nocturnal animal that lives and hunts alone – mainly in the vast forests of

Russia and China. During the harsh winter, the hairs of that unique coat can grow up to 7cm long.
Statement 3 is correct: The Amur leopard is also known as the Far East leopard, the Manchurian leopard or the Korean leopard.

19. Answer: B

Explanation:

The red panda is a small arboreal mammal found in the forests of India, Nepal, Bhutan, and the northern mountains of Myanmar and southern China.
Statement 1 is not correct: In India, this elusive species is found in Sikkim, Arunachal Pradesh, Darjeeling and Kalimpong districts of West Bengal.
Statement 2 is correct: It is the state animal of Sikkim. Listed as Endangered in the IUCN red list of Threatened Species and under Schedule I of the Indian Wildlife (Protection) Act, 1972, the red panda has the highest legal protection.
Statement 3 is correct: It thrives best at 2,200-4,800m in mixed deciduous and conifer forests with dense understories of bamboo, though red panda evidences have also been found at 1800m.

20. Answer: D

Explanation:

Option (d) is correct: The Climate Promise is UNDP's response to climate change. Tackling the climate crisis requires all countries to make bold pledges under the Paris Agreement, or NDCs, to reduce emissions of the greenhouse gases that cause global warming and strengthen adaptation to its impacts.

- The Climate Promise is UNDP's commitment to ensure that any country wishing to increase the ambition of their national climate pledge is able to do so.
- These pledges, or Nationally Determined Contributions, are crucial stepping-stones towards net-zero emissions and meeting the Paris goals.
- The initiative supported over 120 countries, including Montenegro, in revising their NDCs and trying to commit to even more ambitious targets.
- Through the NDC revision process Montenegro committed to reduce its GHG emissions for 35%, by 2030, in comparison to 1990, as a base year.

21. Answer: a

A carbon footprint (or greenhouse gas footprint) is a calculated value or index that makes it possible to compare the total amount of greenhouse gases that an activity, product, company or country adds to the atmosphere. Carbon footprints are usually reported in tonnes of emissions (CO_2-equivalent) per unit of comparison. Such units can be for example tonnes CO_2-eq per year, per kilogram of protein for consumption, per kilometer travelled, per piece of clothing and so forth. A product's carbon footprint includes the emissions for the entire life cycle. These run from the production along the supply chain to its final consumption and disposal.

Hence, statement 1 is correct but statement 2 is incorrect.

Similarly, an organization's carbon footprint includes the direct as well as the indirect emissions that it causes. The Greenhouse Gas Protocol (for carbon accounting of organizations) calls these Scope 1, 2 and 3 emissions. There are several methodologies and online tools to calculate the carbon footprint. They depend on whether the focus is on a country, organization, product or individual person.

Hence, statement 3 is incorrect.

22. Answer: a

Blue Flag beaches

As of October 2022, India has following 12 Blue Flag beaches. The Blue Flag beach is a eco-label awarded to the beaches on the criteria of cleanliness, safety and security of users, amenities and eco-friendliness, etc. These are :-

Odisha
- Puri Beach or Puri beach in Puri.
- Pati Sonepur Sea Beach in Ganjam district

Andhra Pradesh
- Rushikonda Beach in Visakhapatnam.

Tamil Nadu
- Kovalam beach, 40 km south of Chennai.

Puducherry
- Eden Beach in Chinna Veerampattinam.

Andaman and Nicobar
- Radhanagar beach or Beach No 7 in Havelock Islands.

Lakshadweep
- Minicoy Thundi beach in Minicoy.
- Kadmat beach in Kadmat island.

Kerala
- Kappad beach on north fringe of Kozhikode.

Karnataka
- Kasarkod beach in Kasarkod village in Uttara Kannada district.
- Padubidri Beach in Udupi district.

Diu and Daman
- Ghoghla beach in Diu.

Gujarat
- Shivrajpur beach in Dwarka, at Shivrajpur village 12 km from Dwarka on Dwarka-Okha Highway.

Hence, option (a) is correct.

23. Answer: a

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved the Amendments to the National Policy on Biofuels -2018. The following are the main amendments approved to the National Policy on Biofuels:

i. to allow more feedstocks for production of biofuels,

Hence, statement 1 is correct.

ii. to advance the ethanol blending target of 20% blending of ethanol in petrol to ESY 2025-26 from 2030,

Hence, statement 2 is incorrect.

iii. to promote the production of biofuels in the country, under the Make in India program, by units located in Special Economic Zones (SEZ)/ Export Oriented Units (EoUs),

iv. to add new members to the NBCC.

v. to grant permission for export of biofuels in specific cases, and

vi. to delete/amend certain phrases in the Policy in line with decisions taken during the meetings of National Biofuel Coordination Committee.

The National Biofuel Policy-2012 proposes to set up a National Biofuel Coordination Committee (NBCC) headed by the Prime Minister.

Hence, statement 3 is incorrect.

24. Answer: b

Windrow systems are similar to compost techniques where soil is periodically turned in order to enhance aeration. This periodic turning also allows contaminants present in the soil to be uniformly distributed which accelerates the process

of bioremediation.

Hence, statement 1 is correct.

Bioventing is a process that increases the oxygen or air flow into the unsaturated zone of the soil, this in turn increases the rate of natural in situ degradation of the targeted hydrocarbon contaminant.

Hence, statement 2 is incorrect.

Biosparging is the process of groundwater remediation as oxygen, and possible nutrients, is injected. When oxygen is injected, indigenous bacteria are stimulated to increase rate of degradation. However, biosparging focuses on saturated contaminated zones, specifically related to ground water remediation.

Hence, statement 3 is incorrect.

25. Answer: a

Critical wildlife habitats (CWHs) are areas inside wildlife sanctuaries, national parks and tiger reserves – known as 'protected areas' – where people's activities like cattle grazing or collecting leaves compete with the needs of wildlife.

Hence, statement 1 is correct.

The Forest Rights Act, passed in 2006, defines CWHs as areas that are "required to be kept as inviolate for the purposes of wildlife conservation." Such areas are determined for each protected area by a committee which has scientists, local people, and a representative from the Ministry of Tribal Affairs.

Hence, statement 2 is incorrect.

As of December 2020, no CWH has been declared so far in any of the 500-plus protected areas in India. Approximately 2 million individual and community land titles have been recognised so far, including in protected areas.

Hence, statement 3 is incorrect.

26. Answer: b

Methane hydrate is a solid clathrate compound that traps large amounts of methane within a water crystal structure. It is also known as methane clathrate, hydromethane, methane ice, fire ice, natural gas hydrate, or gas hydrate.

Hence, statement 1 is incorrect.

Methane hydrates are formed when methane and water combine at low temperatures and moderate pressures. The methane is produced by the decay of organic matter or leaks from natural gas and oil deposits. The formation of methane hydrates prevents methane from entering the atmosphere.

Hence, statement 2 is incorrect.

Methane hydrates are one of the largest caches of carbon in the world. They are also a globally distributed fossil fuel. When brought up from below the sea floor, one liter of methane hydrate can produce 160 liters of methane

Hence, statement 3 is correct.

27. Answer: d

The carbon dioxide fertilization or carbon fertilisation is not only the cause of plant growth but also contributes the greening effect. It is the phenomena that the increase of carbon dioxide in the

atmosphere increases the rate of photosynthesis in plants.

Hence, statement I is incorrect.

Soils are a major carbon reservoir containing more carbon than the atmosphere and terrestrial vegetation. The anthropogenic impacts on soil can turn it into either a net sink or a net source of Greenhouse Gases (GHGs).

Hence, statement II is correct.

28. Answer: c

The Greenhouse Gas Protocol (GHG Protocol) is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions.

Hence, statement 1 is correct.

The GHG Protocol, a decade-plus partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), is working with businesses, governments, and environmental groups around the world to build a new generation of credible and effective programs for tackling climate change.

It provides the accounting framework for nearly every GHG standard and program in the world - from the International Standards Organization to The Climate Registry - as well as hundreds of GHG inventories prepared by individual companies.

Hence, statement 3 is correct.

The GHG Protocol offers an internationally accepted management tool to help businesses to compete in the global marketplace and governments to make informed decisions about climate change.

Hence, statement 2 is correct.

29. Answer: b

The National Tiger Conservation Authority (NTCA): It is a statutory body under the Ministry of Environment, Forests and Climate Change.

Hence, statement 1 is incorrect.

- It was established in 2005 following the recommendations of the Tiger Task Force.

Hence, statement 2 is correct.

- It was constituted under enabling provisions of the Wildlife (Protection) Act, 1972, as amended in 2006, for strengthening tiger conservation, as per powers and functions assigned to it.

30. Answer: d

The New York Declaration on Forests (NYDF) is a voluntary, non-legally binding political declaration that calls for global action to restore and protect forests.

Hence, statement I is incorrect.

The declaration was adopted in 2014 after the United Nations Secretary-General's Climate Summit, and grew out of dialogue between civil society, companies, and governments. The NYDF provides a framework for forest action that consolidates various objectives and initiatives that drive forest restoration, sustainable use, and protection. The declaration also calls for the end of natural forest loss, and for the restoration of 350

million hectares of degraded forests and landscapes by 2030

Hence, statement II is correct.

31.Solution: c)

Justification: UNIDO and the Global Environment Facility (GEF) are partnering with Ministry of New and Renewable Energy, India, to support capacity building and skill development of technical manpower in the Concentrated Solar Thermal Energy Technologies (CST). UNIDO and National Institute of Solar Energy to initiate a skill development programme for different levels of beneficiaries in the solar thermal energy sector.

Concentrated solar power (CSP, also known as concentrating solar power, concentrated solar thermal) systems generate solar power by using mirrors or lenses to concentrate a large area of sunlight onto a receiver. Electricity is generated when the concentrated light is converted to heat (solar thermal energy), which drives a heat engine (usually a steam turbine) connected to an electrical power generator or powers a thermochemical reaction

NISE and UNIDO will engage national and international experts to bring the best practices by developing specialized training material.

The agreement is part of the ongoing MNRE-GEF-UNIDO project implemented jointly by UNIDO and to support capacity building and skill development of technical manpower in the Concentrated Solar Thermal Energy Technologies (CST) which are being used to replace conventional fossil fuels e.g. coal, diesel, furnace oil etc. and save costs and emissions in the industrial process heat applications.

Different concentrating technologies have been developed or are currently under development for various commercial and industrial applications. For industrial processes where temperatures above 80°C are required, concentrating solar collectors such as parabolic trough or dish collectors, non-imaging concentrators or a Linear Fresnel system are required to be used.

The project strategy builds on the existing favourable framework for solar thermal in India. Factors in favour of the project include the high commitment by the government to the development of its solar thermal industry, and significant interest by the industrial sector to reduce its reliance on fossil fuels. Primary target beneficiaries of the project are energy policy-making and implementing institutions, primarily MNRE, MSME, IREDA, industrial unit owners (end beneficiaries), CS manufacturers, designers, installers, training institutes, energy professionals and service providers and the financial sector.

Q Source: Insights modules

32.Solution: a)

Justification: JPSS-I is first multi-day weather forecasts satellite in NOAA's series of four, next-generation operational environmental satellites representing major advancements in observations used for severe weather prediction and environmental monitoring. It is designed to monitor weather around world and help improve forecasts.

JPSS-I is a joint venture between NASA and National Oceanic and Atmospheric Administration (NOAA) of USA.

It is highly advanced polar-orbiting satellite that will orbit Earth 14 times each day from one pole to other at 824 kms above planet, providing scientists full global coverage twice a day.

JPSS-I carries a suite of advanced instruments designed to take global measurements off atmospheric, land and sea conditions from sea surface temperatures, volcanic ash, hurricane intensity and many more. **It uses infrared rays for mapping.**

Q Source: Climate-related initiatives

33.Solution: b)

Learning: The mechanism known as "joint implementation," defined in Article 6 of the Kyoto Protocol, allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex B Party, each equivalent to one tonne of CO2, which can be counted towards meeting its Kyoto target. Joint implementation offers Parties a flexible and cost-efficient means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer. A JI project must provide a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to what would otherwise have occurred. Projects must have approval of the host Party and participants have to be authorized to participate by a Party involved in the project.

Q Source: http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php

34.Solution: d)

Justification: Coalbed methane (CBM) is an unconventional form of natural gas found in coal deposits or coal seams.

CMB is formed during the process of coalification, the transformation of plant material into coal.

CBM can be used

- In Power generation.
- As Compressed natural gas (CNG) auto fuel.
- As feedstock for fertilisers.

Industrial uses such as in cement production, rolling mills, steel plants, and for methanol production.

Learning: Coalbed methane is associated with coal deposits, and is found in coal seams. In the past, the gas was the cause of numerous explosions in underground mines. More recently, the gas has been vented to the surface from underground mines. It is only during the last twenty-five years that it was realized that coalbed methane could be used as a resource. Various basins in the Rocky Mountains hold much of this country's coalbed methane resources.

When water is removed from a coal seam, it lowers the reservoir pressure. Methane that was held in place by water pressure tends to follow the water as it is pumped to the surface, where it is captured and transported through pipelines to storage facilities or shipped. This relatively inexpensive and straightforward procedure has made coalbed methane a useful, easily accessible form of energy.

However, CBM production behaviour is complex and difficult to predict in the early stages of recovery.

Another concern is the effect water discharges from CBM development could potentially have on downstream water sources.

Disposal of the highly salinized water that must be removed in order to release the methane creates a challenge, as its introduction into freshwater ecosystems could have adverse effects.

Q Source: Insights modules

35.Solution: d)

Justification: High concentrations of fluoride in ground water are common in some of the semi-arid areas of Rajasthan, southern Punjab, Gujarat, Karnataka, Tamil Nadu, Madhya Pradesh, and southern Haryana. Groundwater in at least 387 districts has high nitrate levels.

As for other pollutants, Arsenic pollution of ground water in West Bengal was first reported in the early eighties. The occurrence of arsenic is mainly due to two reasons: natural and anthro-

pogenic.
Q Source: 11th Chemistry NCERT

36. Correct Answer : C

Answer Justification :

Explanation:

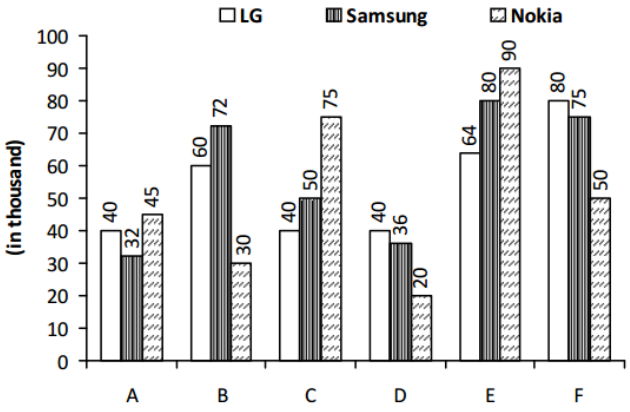
Statement i is correct because money is the answer for some, not all. Statement ii is correct because of the analysis of education budget by University College.

37. SOLUTION: (d)

If Statement IV of above-mentioned question is true, then statement II is definitely true. Because if some colors are not pleasant then some colors are pleasant.

Directions : Consider the given information and answer the following question

The given bar graph shows the number of mobile users of three brands (LG, Samsung and Nokia) in different cities. The table shows the percentage of Females among these mobile users.



City	% Female (LG)	% Female (Samsung)	% Female (Nokia)
A	30	45	51
B	36	42	48
C	54	50	45
D	39	49	50
E	46	58	55
F	49	58	42

38. Solution: D) 21600

Number of Female mobile users of LG brand in City C = 40000 * (54/100)
= 21,600
Hence, option (d) is correct.

39. Option d) Both I and II are sufficient

From I, length of train A = 180 m
speed of train A = 180/12 = 15 m/sec
only statement I is not sufficient.
Both from I and II,
speed of train B = 15/3 * 5 = 25 m/sec
let length of train B = x
x + 280/20 = 25
x = 220
both statement I and II is required to get answer.

40. Option A) Only I is sufficient.

From I,
CI – SI = PR^2/100^2
90 = 4000 * R^2/10000
R = 15%
From II, Here principal is not given so we can not get answer.
only statement I is sufficient.