

QUESTION 1.

The Johannesburg Declaration was adopted during which significant international event?

- a) Earth Summit 1992 in Rio de Janeiro, Brazil.
- b) World Summit on Sustainable Development, South Africa in 2002.
- c) Kyoto Protocol Conference in Kyoto, Japan.
- d) United Nations Climate Change Conference (COP21) in Paris, France.

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

· The **Johannesburg Declaration** refers to a significant outcome document adopted during the **World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, in 2002**. The WSSD was a United Nations conference that aimed to address various environmental and development issues and build upon the achievements of the **Earth Summit** held in Rio de Janeiro in 1992.

· The Johannesburg Declaration served as a political statement and commitment by world leaders towards sustainable development and poverty eradication. It emphasized the need for collective action and partnerships to achieve sustainable development goals and highlighted key areas of focus such as poverty reduction, access to clean water and sanitation, energy, health, biodiversity, and the promotion of sustainable consumption and production patterns.

· The declaration recognized the importance of integrating economic, social, and environmental dimensions of sustainable development and called for increased efforts to address global challenges such as climate change, environmental degradation, and the conservation of natural resources. It also highlighted the role of multilateralism, international cooperation, and the involvement of various stakeholders in achieving sustainable development objectives.

· The Johannesburg Declaration aimed to provide a framework and guidance for countries and stakeholders to work towards sustainable development goals and take concrete actions for a more equitable and sustainable future.

QUESTION 2.

Consider the following gases related to Green House gases:

- 1. Carbon dioxide
- 2. Methane
- 3. Oxygen

4. Nitrogen

5. Nitrous oxide

How many of the above gases are main component gases of Green House Gas emission?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Greenhouse gases are gases in the Earth's atmosphere that contribute to the greenhouse effect. These gases trap heat from the sun and prevent it from escaping back into space, leading to an increase in the Earth's temperature. The main greenhouse gases include:

- **Carbon Dioxide (CO₂):** Produced primarily through the burning of fossil fuels such as coal, oil, and natural gas, as well as deforestation and land-use changes.
- **Methane (CH₄):** Generated by natural processes, including the decomposition of organic matter in landfills, agriculture (livestock and rice cultivation), and the extraction and transport of fossil fuels.
- **Nitrous Oxide (N₂O):** Emitted from agricultural and industrial activities, as well as the combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** These gases include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). They are synthetic compounds used in various industrial applications such as refrigeration, air conditioning, and electronics.

These greenhouse gases contribute to the Earth's natural greenhouse effect, which is essential for sustaining life. However, human activities have significantly increased their concentrations in the atmosphere, leading to enhanced warming and climate change. Mitigating the emissions of greenhouse gases is crucial for limiting the impacts of climate change.

Oxygen and nitrogen are not greenhouse gases, because they are transparent to infrared light . These molecules are invisible because when you stretch one, it doesn't change the electric field. These are symmetric molecules, made of two identical atoms whose electric fields just cancel each other out.

QUESTION 3.

Consider the following prerequisites in regard to bio magnification in food web:

1. Longevity
2. Mobility
3. Solubility in water
4. Insolubility in fats

How many of the above are a prerequisite in regard to pollutants necessary for bio magnification in food web?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

- Biomagnification refers to the tendency of pollutants to concentrate as they move from one trophic level to the next.
- Thus, in biomagnification there is an increase in concentration of a pollutant from one link in a food chain to another.
- In order for biomagnification to occur, the pollutant must be:
 - o Long-lived.
 - o Mobile.
 - o Soluble in fats.
 - o Biologically active.
- If a pollutant is **short-lived** , it will be broken down before it can become dangerous. **(Hence 1 is correct)**
- If it is not **mobile**, it will stay in one place and is unlikely to be taken up by organisms. **(Hence 2 is correct)**
- If the pollutant is **soluble in water** , it will be excreted by the organism. **(Hence 3 is incorrect)**
- Pollutants that **dissolve in fats** , however, may be retained for a long time. **(Hence 4 is incorrect)**

· It is traditional to measure the amount of pollutants in fatty tissues of organisms such as fish. In mammals, we often test the milk produced by females, since the milk has a lot of fat in it are often more susceptible to damage from toxins (poisons). If a pollutant is not active biologically, it may biomagnify, but we really don't worry about it much, since it probably won't cause any problems
Examples: DDT.

QUESTION 4.

Consider the following pairs with reference to Pollutants:

1. Secondary Pollutants: These persist in the form in which they are added to the environment.
2. Qualitative Pollutants: These occur in nature and become pollutant when their concentration reaches beyond a threshold level.
3. Quantitative Pollutants: These do not occur in nature and are manmade.

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

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Pollutants

Pollutants are the materials or factors, which cause adverse effect on the natural quality of any component of the environment.

For example, smoke from industries and automobiles, chemicals from factories, radioactive substances from nuclear plants, sewage of houses and discarded household articles are the common pollutants.

Classifications

· According to the form in which they persist after release into the environment.

o Primary pollutants: These persist in the form in which they are added to the environment e.g. DDT, plastic.

o Secondary Pollutants: These are formed by interaction among the primary pollutants. For example, peroxyacetyl nitrate (PAN) is formed by the interaction of nitrogen oxides and hydrocarbons. **(Hence pair 1 is incorrectly matched)**

· According to their existence in nature.

o Quantitative Pollutants: These occur in nature and become pollutant when their concentration reaches beyond a threshold level. E.g. carbon dioxide, nitrogen oxide. **(Hence pair 2 is incorrectly matched)**

o Qualitative Pollutants: These do not occur in nature and are man-made. E.g. fungicides, herbicides, DDT etc. **(Hence pair 3 is incorrectly matched)**

· According to their nature of disposal.

o Biodegradable Pollutants: Waste products, which are degraded by microbial action. E.g. sewage.

o Non-biodegradable Pollutants: Pollutants, which are not decomposed by microbial action. E.g. plastics, glass, DDT, salts of heavy metals, radioactive substances etc.,)

· According to origin

o Natural

o Anthropogenic

QUESTION 5.

Which of the following gases contribute to the formation of Acid Rain?

- a) Sulfur dioxide (SO_2) and Carbon dioxide (CO_2)
- b) Carbon dioxide (CO_2) and nitrogen (N_2)
- c) Sulfur dioxide (SO_2) and nitrogen oxides (NO_x)
- d) Hydrogen (H_2) and helium (He)

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Acid Rain

· Acid rain refers to any precipitation (rain, fog, mist, snow) that is more acidic than normal (pH of less than 5.6. pH below 7 is acidic).

- Acid rain is caused by atmospheric pollution from acidic gases such as sulphur dioxide and oxides of nitrogen emitted from the burning of fossil fuels.
- It is also recognized that acidic smog, fog, mist, move out of the atmosphere and settle on dust particles which in turn accumulate on vegetation as acid depositions.
- When rain falls, the acid from these depositions leak and form acid dews.

Gases that cause acid rain

- **SO_x (Sulphur oxides):** Fossil fuel burning, power plants, smelting of metal sulphide ores, industrial sources, industrial production of sulfuric acid in metallurgical, chemical and fertiliser industries volcanoes, seas and oceans, decomposition of organic matter.
- **NO_x (Nitrogen oxides - NO, NO₂ and N₂O):** Fossil fuel burning, lightning, biomass burning, forest fires, oceans, power plants. (NO and N₂O are mentioned in NIOS Environment)
- Nitrogen will only react with oxygen at high temperatures pressures in lightning bolts and combustion reaction in power plants or internal combustion engines. nitric oxide (NO) and Nitrogen dioxide (NO₂) are formed under these conditions. Eventually, nitrogen dioxide may react with water in the rain to form nitric acid, HNO₃. The nitrates thus formed may be utilized by plants as a nutrition (so, the sun gets nitrogen form acid rain)
- **(Hence option (c) is correct answer)**

QUESTION 6.

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. It was drafted as a result of a resolution adopted in 1963 at a meeting of members of which of the following?

- a) Global Environment Facility
- b) UNICEF Governing Council
- c) UNEP
- d) World Conservation Union

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

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. CITES was

drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union).

QUESTION 7.

Consider the following about the source of Water Pollution:

1. Sewage treatment plants
2. Oil tankers
3. Acid deposition
4. Livestock feedlots

How many of them are considered as point sources of water pollution?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Water Pollution

'Addition of certain substances to the water such as organic, inorganic, biological, radiological, heat, which degrades the quality of water so that it becomes unfit for use'. Water pollution is not only confined to surface water, but it has also spread to ground water, sea and ocean.

Point Source:

- Sources of pollution which are close to the water sources are called point sources.
- Pollutants are discharged directly into water bodies.
- Easy to treat the pollutants in the water treatment plant before they enter the water bodies.
- More harmful.
- Examples of point sources include:

o Industrial plants/factories (e.g., oil refineries, pulp and paper mills, chemical manufacturers, automobile manufacturers, food processors, pharmaceutical manufacturers) **(Hence 1 is correct)**

o Sewage Treatment Plants. **(Hence 2 is correct)**

o operational wastes from industries; and

Non-point sources:

- Sources of pollution which are scattered and do not have any specific location are called non-point sources.
- Pollutants are discharged away from water bodies and at various places.
- Difficult to treat the pollutants before they enter water bodies.
- Less harmful in comparison to point source water pollution.
- For Example- Garden, roads, construction sites, runoff water from the field, etc.
- Examples of non-point sources of pollution include the following:
 - o Sediments from construction, forestry operations and agricultural lands;
 - o Bacteria and microorganisms from failing septic systems and pet wastes;
 - o Nutrients (from fertilizers and yard debris) and pesticides from agricultural areas, golf courses, athletic fields and residential yards;
 - o Oil, grease, antifreeze, and metals washed from roads, parking lots and driveways;
 - o Toxic chemicals and cleaners that were not disposed of properly
 - o Litter thrown onto streets, sidewalks and beaches, or directly into the water by individuals.
 - o Acid deposition, runoff of chemicals into surface water from croplands, livestock feedlots, logged forests, urban streets, lawns, golf courses and parking lots. **(Hence 3 and 4 is incorrect)**

QUESTION 8.

The term 'Putrescibility' refers to?

- a) The ability of materials to decompose.
- b) The ability of materials to resist decomposition.
- c) The Ability of materials to withstand environmental conditions.
- d) The ability of materials to generate heat during decomposition.

Correct Answer: A

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (a)

Explanation:

· Putrescibility is a term used to describe the ability to decompose or rot of organic matter present in water by microorganisms using oxygen, typically resulting in the production of foul odors. It is a measure of how easily organic substances can decay or putrefy.

· In the context of waste management and environmental assessments, putrescibility is an important factor to consider. Organic waste, such as food scraps, agricultural residues, and other biodegradable materials, can undergo putrefaction when left untreated or improperly managed. The decomposition process releases gases like methane and other volatile organic compounds, contributing to unpleasant odors and potential environmental concerns.

· Assessing the putrescibility of waste helps determine the appropriate waste management strategies. For example, highly putrescible waste may require special handling and treatment methods, such as composting, anaerobic digestion, or other biological processes that facilitate controlled decomposition. By managing putrescible waste effectively, the production of foul odors and the release of harmful gases into the environment can be minimized.

(Hence option (a) is correct answer)

QUESTION 9.

Which of the following gas is released by incomplete combustion of petrol and wood and it lowers the amount of oxygen if inhaled in human blood?

- a) Carbon Dioxide (CO₂)
- b) Methane (CH₄)
- c) Carbon Monoxide (CO)
- d) Hydrogen Sulphide (H₂S)

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Carbon Monoxide (CO)

· It is a colourless, odourless gas that is produced by the incomplete burning of carbon-based fuels including petrol, diesel, and wood.

· It is also produced from the combustion of natural and synthetic products such as cigarettes.

· It lowers the amount of oxygen that enters our blood.

· It can slow our reflexes and make us confused and sleepy.

(Hence option (c) is correct answer)

QUESTION 10.

Which of the following best represents the Greenhouse Gases (GHGs) in the descending order of their Green House Warming Potential for the time period of 100 years?

- Sulphur Hexafluoride, Nitrous Oxide, Perfluorocarbon, Methane, Carbon dioxide
- Hydrofluorocarbons, Sulphur Hexafluoride, Perfluorocarbon, Methane, Nitrous Oxide
- Sulphur Hexafluoride, Perfluorocarbon, Hydrofluorocarbons, Nitrous oxide, Methane
- Hydrofluorocarbons, Sulphur Hexafluoride, Methane, Nitrous Oxide, Perfluorocarbon

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Green House Warming Potential

Sl no	Green House Gas (GHG)	Green House Warming Potential (100-year)
1	Carbon Dioxide	1
2	Methane	21
3	Nitrous Oxide	310
4	Hydrofluorocarbons (HFCs)	140-11700
5	Perfluorocarbon (PFCs)	6500-9200
6	Sulphur Hexafluoride (SF ₆)	23900

Sulphur Hexafluoride > Perfluorocarbon > Hydrofluorocarbons > Nitrous oxide > Methane

(Hence option (c) is correct answer)

QUESTION 11.

Match the following pairs:

List I

List II

- | | |
|-----------------|---|
| 1. Black Carbon | A. Stored in the form of aquatic biomass. |
| 2. Brown Carbon | B. Originates from the incomplete combustion of fossil fuels. |
| 3. Blue Carbon | C. Stored in the soil of natural ecosystems. |
| 4. Green Carbon | D. Released by the combustion of organic matter. |

Select the correct answer using the code given below:

- | 1 | 2 | 3 | 4 |
|------|---|---|---|
| a) B | D | C | A |
| b) B | D | A | C |
| c) D | B | A | C |
| d) D | B | C | A |

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

List I

List II

- | | |
|-----------------|---|
| 1. Black Carbon | B. Originates from the incomplete combustion of fossil fuels. |
| 2. Brown Carbon | D. Released by the combustion of organic matter. |
| 3. Blue Carbon | A. Stored in the form of aquatic biomass. |
| 4. Green Carbon | C. Stored in the soil of natural ecosystems. |

Black carbon:

· Black carbon (BC) is a component of fine particulate matter of the size 2.5 µm. It consists of pure carbon, which originates from the incomplete combustion of fossil fuels, coal, biofuel, biomass, wood, rubber, etc. It is emitted in the form of soot.

· Soot is an airborne mass of impure carbon particles resulting from the incomplete combustion of hydrocarbons. It originates from pyrolysis.

Brown Carbon:

· Brown carbon is brown smoke released by the combustion of organic matter. It coexists with black carbon when released in the atmosphere.

· It is one of the significant warming factors as it disturbs the temperature pattern of the atmosphere and the cloud forming process.

· It also changes the solar absorption pattern and the nature of clouds.

Blue Carbon:

· It is the carbon captured by the world's oceans and coastal ecosystems.

· This carbon is captured by living organisms in oceans is stored in the form of aquatic biomass.

· Seagrasses, mangroves, and marshes are types of vegetated coastal blue carbon ecosystems, these habitats have a cover of approximately 49 million hectares worldwide.

· Blue carbon ecosystem act as the major sink for capturing atmospheric carbon and reducing warming effects.

Green Carbon:

· It is the carbon captured into terrestrial plant biomass in photosynthesis and stored in the plants and soil of natural ecosystems and is a vital part of the global carbon cycle.

QUESTION 12.

Consider the following air pollutants:

1. Lead
2. Ozone
3. Suspended Particulate Matter
4. Sulphur Dioxide

How many of the above are air pollutant as per the Air (Prevention and Control) of Pollution Act, 1981?

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

Correct Answer: D

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (d)

Explanation:

Air Pollution

· As per the Air (Prevention and Control) of Pollution Act, 1981, “air pollutant” means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

· Air Pollution means presence in the atmosphere of any air pollutant.

· Major air pollutants are:

o Carbon Monoxide

o Carbon Dioxide

o Chlorofluorocarbons (CFCs)

o Lead (**Hence 1 is correct**)

o Ozone (**Hence 2 is correct**)

o Suspended Particulate Matter (**Hence 3 is correct**)

o Sulphur Dioxide (**Hence 4 is correct**)

QUESTION 13.

Consider the following statements:

1. The Ecological footprint is a measure of human demand on the Earth's ecosystems.
2. The carbon footprint tells the demand on the Earth that result from burning fossil fuels.
3. Earth Overshoot Day is calculated by the Global Footprint Network.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (c)

Explanation:

Ecological Footprint

- The “ecological footprint” is a measure of human demand on the Earth’s ecosystems. **(Hence statement 1 is correct)**
- It is a standardized measure of demand for natural capital that may be contrasted with the planet’s ecological capacity to regenerate and represents the amount of biologically productive land and sea area necessary to supply the resources a human population consumes, and to assimilate associated waste.
- Currently, humanity’s total ecological footprint is estimated at 1.5 planet Earths—in other words, humanity uses ecological services 1.5 times as fast as Earth can renew them.
- The “carbon footprint” is the amount of carbon being emitted by an activity or organization. The carbon component of the ecological footprint converts the amount of carbon dioxide being released into the amount of productive land and sea area required to sequester it and tells the demand on the Earth that result from burning fossil fuels. **(Hence statement 2 is correct)**
- The carbon footprint is 54% of the ecological footprint and its most rapidly-growing component having increased 11- fold since 1961.
- Global Footprint Network (GFN) every year presents a report on ecological footprint which maps consumption and requirement of natural resources to sustain it. The lifestyle adopted in developed countries is unsustainable and it will require five Earths to fulfill their lifestyle demands.
- On the other hand, the Indian lifestyle is sustainable where one earth is sufficient. The Earth Overshoot Report has indicated that the Ecological Footprint of developed countries ranges from 8 to 4 whereas India is at 0.9.
- Earth Overshoot Day is the Calendar date on which human resource consumption for that particular year exceeds Earth’s capacity to regenerate those resources required for the human consumption for the entire year. It is calculated by Global Footprint Network, an independent think tank. **(Hence statement 3 is correct)**

QUESTION 14.

Consider the following statement with reference to Oceanic Acidification:

1. Checking CO and CO₂ emissions and controlling pollution are the only means to reduce ocean acidification.
2. Eutrophication is one of the causes for oceanic acidification.
3. Accelerated melting of Arctic ice is increasing acidification of ocean.

How many of the given statements is/are correct?

- a) Only one
- b) Only two

- c) All three
d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Ocean Acidification

- Ocean acidification has been called the “evil twin of global warming” and “the other CO₂ problem”.
- It is the ongoing decrease in the pH of the Earth’s oceans (ocean water is alkaline (pH of ~ 8.1)) caused by the uptake of carbon dioxide (CO₂) from the atmosphere.
- Checking CO and CO₂ emissions and controlling pollution are the only means to reduce ocean acidification. **(Hence statement 1 is correct)**

Mechanism

- An estimated 30–40% of the carbon dioxide from human activity released into the atmosphere dissolves into oceans, rivers and lakes.
- To achieve chemical equilibrium, some of it reacts with the water to form carbonic acid.
- Some of these extra carbonic acid molecules react with a water molecule to give a bicarbonate ion and a hydronium ion (H⁺), thus increasing ocean acidity (H⁺ ion concentration).

Other contributors

- Eutrophication leads to large plankton blooms, and when these blooms collapse and sink to the sea bed the subsequent respiration of bacteria decomposing the algae leads to a decrease in seawater oxygen and an increase in CO₂ (a decline in pH). **(Hence statement 2 is correct)**
- Accelerated melting of Arctic ice is increasing acidification. Water under the sea, which had a deficit of CO₂, is now exposed to atmospheric CO₂ and can take it up freely. **(Hence statement 3 is correct)**
- Also, the melt water dilutes the carbonate ion concentration and neutralizes the seawater’s ability to convert CO₂ into bicarbonate which results in rapidly decreasing ocean pH. And since the sea water mixed with meltwater is light and can’t mix easily into deeper waters, the CO₂ is concentrated at the surface.

Value Addition:

- Increase in CO₂ concentrations not only leads to warmer oceans but also to more acidic oceans.
- As the uptake of atmospheric carbon dioxide by the ocean increases, the concentration of hydrogen ions in the ocean increases, the concentration of carbonate ions decreases, the pH of

the oceans decreases and the oceans become less alkaline – this process is known as ocean acidification.

· Carbonic acid reacts with carbonate ions in the water to form bicarbonates. Ocean Acidification will convert more carbonate ions (which are required for shell-building by marine organisms) into bicarbonates, the animals need to expend more energy to build their shells. As a result, the shells end up being thinner and more fragile.

· In the long run, this reaction will allow the ocean to soak up excess carbon dioxide because more acidic water will dissolve more rock, release more carbonate ions, and increase the ocean's capacity to absorb carbon dioxide.

· Deep, cold ocean waters are naturally under saturated with carbonate ions causing the shells of most calcifying organisms to dissolve.

· Surface waters are over saturated with carbonate ions and do not readily dissolve shells of calcifying organisms.

· The saturation horizon is the level below which calcium carbonate minerals undergo dissolution.

· Ocean acidification causes this horizon to rise vertically in the water column so more and more calcifying organisms will be exposed to under saturated water and thus vulnerable to dissolution of their shells and skeletons.

· The saturation horizon of calcite (relatively less soluble mineral form found in the shells of planktonic algae, some corals, echinoderms, and some mollusks) occurs at a greater ocean depth than that for aragonite (more soluble form of calcium carbonate; it is found in most corals, most mollusks)

· The current increased rate of dissolution of atmospheric CO₂ into the ocean results in an imbalance in the carbonate compensation depth (CCD), the depth at which all carbonate is dissolved.

· As the pH of the ocean falls, it results in a shallowing of the CCD, thus exposing more of the shells trapped in the sediments to under saturated conditions causing them to dissolve, which will help buffer ocean acidification but over a long time scale of a thousand years.

QUESTION 15.

The Brundtland Report, 1987, also known as Our Common Future, relates to which of the following?

- a) Marine environment
- b) World's natural heritage
- c) Biodiversity hotspots
- d) Sustainable development

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)**Explanation:**

Our Common Future, also known as the Brundtland Report, was published on October 1987 by the United Nations through the Oxford University Press. This publication was in recognition of Gro Harlem Brundtland's, former Norwegian Prime Minister, role as Chair of the World Commission on Environment and Development (WCED).

The Brundtland Report stated that critical global environmental problems were primarily the result of the enormous poverty of the South and the non-sustainable patterns of consumption and production in the North. It called for a strategy that united development and the environment - described by the now-common term "sustainable development".

QUESTION 16.

Consider the following statements:

1. Bovines emit methane due to belching.
2. Livestock grazing between land and streams destabilizes stream banks.
3. Manure contains high amounts of nitrogen, phosphorous, and potassium which causes contamination of groundwater.
4. Livestock grazing leads to reseeding of natural meadows which impact native species.

How many of the given statements is/are correct?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation**Solution (d)****Explanation:****Livestocks**

Animals and birds that are kept on a farm, such as cows, sheep, or chickens are termed as livestock.

Disadvantages of Livestock Farming:

- One of the primary disadvantages is the loss of land. To home the livestock animals, a good amount of land is necessary.
- It also results in less water for the food crops, as these Livestock Animals drink a lot of water particularly the cattle animals.
- Bovines emit methane due to belching. Ninety million tonnes of methane is estimated to come from livestock farming due to what is known as enteric fermentation in ruminant animals. **(Hence statement 1 is correct)**
- Animals such as cows, sheep and goats expel large amounts of methane as they digestion their food due to micro-organisms in their stomachs, specifically the rumen. These organisms help the cow break down otherwise inedible grass and hay to get nutrients but create methane in the process, which is expelled from the animal.
- Livestock grazing between land and streams destabilizes stream banks making them vulnerable to erosion. Overgrazing destroys the grass root system and degrades the soil holding capacity, loosening them to flow easily under the impact of water near the stream banks. **(Hence statement 2 is correct)**
- Livestock rearing leads to high amount of manure generation. Manure contains high amounts of nitrogen, phosphorous, and potassium which causes contamination of groundwater being highly soluble in water. First two are the most important as pollutants. **(Hence statement 3 is correct)**
- The problem of overgrazing destroys the grassland ecosystem as it leads to reseeding of natural meadows which impact native species by destroying their habitat and thus pollutes waterways with runoff and silt as soil is washed away. Further, it requires a lot of investment. **(Hence statement 4 is correct)**
- Generates huge amounts of waste to dispose of thus polluting the environment

QUESTION 17.

Consider the following statement with reference to Carbon Credits and Carbon Offsets:

1. Carbon Offset represents the legal right to emit one ton of carbon or equivalent greenhouse gas.
2. Carbon Credit is generated by a reduction in emissions made by a voluntary project designed for that purpose.

Which of the above statement is/are correct?

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

**Correct Answer:** D**Your Answer:** Unanswered**Marks:** 0/1.00**Explanation****Solution (d)****Explanation:****Carbon Credit**

- A carbon credit is a tradable certificate or permit representing the right to emit one ton of carbon or carbon dioxide equivalent (tCO₂e). **(Hence statement 1 is incorrect)**
- One carbon credit is equal to one ton of carbon dioxide, or in some markets, carbon dioxide equivalent gases.
- An organization which produces one ton less of carbon or carbon dioxide equivalent than the standard level of carbon emission allowed for its outfit or activity, earns a carbon credit.

Carbon Offset

- Carbon offsets are credits for reductions in greenhouse gas emissions made at another location, such as wind farms which create renewable energy and reduce the need for fossil-fuel powered energy. **(Hence statement 2 is incorrect)**
- Carbon offsets are quantified and sold in metric tons of carbon dioxide equivalent (CO₂e).
- Buying one ton of carbon offsets means there will be one less ton of carbon dioxide in the atmosphere than there would otherwise have been.
- Carbon offsetting is often the fastest way to achieve the deepest reductions within businesses and it also often delivers added benefits at the project site, such as employment opportunities, community development programmes and training and education.

QUESTION 18.

Consider the following parameters for defining water quality:

1. Turbidity
2. Dissolved Oxygen 374078
3. Hardness due to presence of Arsenic, Cadmium and Chromium.

How many of the above is/are the parameters for defining water quality?

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

**Correct Answer:** B**Your Answer:** Unanswered**Marks:** 0/1.00**Explanation****Solution (b)****Explanation:****Water Quality**

The five following parameters are basic to life within aquatic systems. Impairments of these can be observed as impacts to the flora and or fauna with a given water body.

Dissolved Oxygen:

- It is the amount of oxygen dissolved in water. Most aquatic organisms need oxygen to survive and grow.
- Some species require high DO such as trout and stoneflies. Other species do not require high DO, like catfish, worms and dragonflies.
- If there is not enough oxygen in the water the following may happen: Death of adults and juveniles, Reduction in growth, Failure of eggs/larvae to survive, Change of species present in a given water body.

Temperature:

- Temperature is a measure of the average energy (kinetic) of water molecules. It is measured on a linear scale of degrees Celsius or degrees Fahrenheit.
- It is one of the most important water quality parameters. Temperature affects water chemistry and the functions of aquatic organisms.
- It influences the amount of oxygen that can be dissolved in water, rate of photosynthesis by algae and other aquatic plants, metabolic rates of organisms, sensitivity of organisms to toxic wastes, parasites and diseases, and timing of reproduction, migration, and aestivation of aquatic organisms.

Electrical Conductivity/Salinity:

- Salinity is a measure of the amount of salts in the water. Because dissolved ions increase salinity as well as conductivity, the two measures are related. The salts in sea water are primarily sodium chloride (NaCl).
- They also have a critical influence on aquatic biota, and every kind of organism has a typical salinity range that it can tolerate. Moreover, the ionic composition of the water can be critical. For example, cladocerans (water fleas) are far more sensitive to potassium chloride than sodium chloride at the same concentration.
- Conductivity will vary with water source: ground water, water drained from agricultural fields, municipal waste water, rainfall. Therefore, conductivity can indicate groundwater seepage or a sewage leak.

pH:

- pH is a measure of how acidic or basic (alkaline) the water is which means strength of the hydrogen).
- It is defined as the negative log of the hydrogen ion concentration. The pH scale is logarithmic and goes from 0 to 14.
- For each whole number increase (i.e. 1 to 2) the hydrogen ion concentration decreases tenfold and the water becomes less acidic. As the pH decreases, water becomes more acidic. As water becomes more basic, the pH increases
- Many chemical reactions inside aquatic organisms (cellular metabolism) that are necessary for survival and growth of organisms require a narrow pH range.
- At the extreme ends of the pH scale, (2 or 13) physical damage to gills, exoskeleton, fins, occurs.
- Changes in pH may alter the concentrations of other substances in water to a more toxic form.

Turbidity:

- Turbidity is a measure of the amount of suspended particles in the water.
- Algae, suspended sediment, and organic matter particles can cloud the water making it more turbid. Suspended particles diffuse sunlight and absorb heat.
- This can increase temperature and reduce light available for algal photosynthesis. If the turbidity is caused by suspended sediment, it can be an indicator of erosion, either natural or manmade. Suspended sediments can clog the gills of fish.
- Once the sediment settles, it can foul gravel beds and smother fish eggs and benthic insects. The sediment can also carry pathogens, pollutants and nutrients.

Hardness due to presence of Arsenic, Cadmium and Chromium is not a parameter for defining water quality. **(Hence 3 is incorrect)**

QUESTION 19.

Consider the following with respect to sources of Methane:

1. Wetlands
2. Sugarcane plantation
3. Gas drilling
4. Domestic livestock

How many of the above is/are the source of Methane?

- a) Only one
- b) Only two



- c) Only three
d) All four

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Methane

Methane (CH₄) is emitted by natural sources such as wetlands, as well as human activities such as leakage from natural gas systems and the raising of livestock.

Natural processes in soil and chemical reactions in the atmosphere help remove CH₄ from the atmosphere.

Source

Natural sources:

- Wetlands are the largest source, emitting CH₄ from bacteria that decompose organic materials in the absence of oxygen. **(Hence 1 is correct)**
- Smaller sources include termites, oceans, sediments, volcanoes, and wildfires.

Human induced:

- Agriculture: Domestic livestock such as cattle, buffalo, sheep, goats, and camels produce large amounts of CH₄ as part of their normal digestive process. Also, when animals' manure is stored or managed in lagoons or holding tanks, CH₄ is produced. Because humans raise these animals for food, the emissions are considered human-related. Globally, the Agriculture sector is the primary source of CH₄ emissions. **(Hence 4 is correct)**
- Industry: Methane is the primary component of natural gas. Some amount of CH₄ is emitted to the atmosphere during the production, processing, storage, transmission, and distribution of crude oil & natural gas. **(Hence 3 is correct)**
- Waste from Homes and Businesses: Methane is generated in landfills as waste decomposes and from the treatment of wastewater.

Sugarcane plantation doesn't require water-logged conditions so it is not involved in the methane production. **(Hence 2 is incorrect)**

QUESTION 20.

Consider the following pairs as per the government notification regarding the Pollution Index:

1. White Industries: Organic Manure.



2. Red Industries: Automobile Servicing, Repairing.

3. Orange Industries: Oil & Gas Extraction.

4. Green Industries: Ayurvedic Medicines.

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

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Pollution Index

The Ministry of Environment, Forest and Climate Change (MoEFCC) has developed the criteria of categorization of industrial sectors based on the Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources. The Pollution Index PI of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector.

'Range of Pollution Index' for the purpose of categorization of industrial sectors is:

- Industrial Sectors having Pollution Index score of 60 and above - Red category
- Industrial Sectors having Pollution Index score of 41 to 59 - Orange category
- Industrial Sectors having Pollution Index score of 21 to 40 - Green category
- Industrial Sectors having Pollution Index score incl. & up to 20 - White category

Some examples:

· **White** - Air conditioners, bicycles, CFL lamp, **Organic manure**, chalk making, medical oxygen, handloom (**Hence pair 1 is correctly matched**)

· **Green** - Aluminum Utensils, Distilled water, flour mills, **Ayurvedic medicines**, power looms, saw mill, tea processing (**Hence pair 4 is correctly matched**)

· **Orange** - Dry cell battery, food processing, glass manufacturing, and **automobile servicing, Fish processing and packing** (**Hence pair 2 is incorrectly matched**)

· **Red** - Lead acid battery, Automobile Manufacturing, cement, **oil & gas extraction**, pharmaceuticals, fire crackers, cement, pesticides, tanneries (**Hence pair 3 is incorrectly matched**)

QUESTION 21.

Consider the following statements with reference to smog:

1. Classical smog is also known as 'Los Angeles smog'.
2. The primary component of classical smog is sulphur dioxide.
3. Photochemical smog requires neither smoke nor fog for its formation.
4. The primary component of photochemical smog is ozone.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Smog

· The term smog was first used in 1905 by Dr. H A Des Voeux to describe the conditions of fog that had soot or smoke in it.

· Smog caused by the burning of large amounts of coal, vehicular emission and industrial fumes (Primary pollutants).

· Smog is a combination of various gases with water vapor and dust.

· Smog contains soot particulates like smoke, sulphur dioxide, nitrogen dioxide and other components.

There are 2 distinct types of smog:

Classical Smog/Sulfurous Smog/London Smog:

· Classical smog is also known as 'London smog'. (**Hence statement 1 is incorrect**)

- It is caused by high concentrations of sulphur oxides in the air due to use of sulphur bearing fossil fuels like coal. **(Hence statement 2 is correct)**
- Since sulphur oxides are reducing agents, it is also called as 'reducing smog'.
- It is particularly formed in the morning hours of winter months when the temperatures are low. Hence it is known as 'winter smog'.
- This type of smog is aggravated by dampness and a high concentration of suspended particulate matter in the air.

Photochemical Smog/Los Angeles Smog:

- Photochemical smog (smog) is a term used to describe air pollution that is a result of the interaction of sunlight with certain chemicals in the atmosphere.
- It requires neither smoke nor fog. **(Hence statement 3 is correct)**
- The primary component of photochemical smog is ozone ; thus, it is also called as 'oxidizing smog'. **(Hence statement 4 is correct)**
- Ground-level ozone is formed when vehicle emissions containing nitrogen oxides (primarily from vehicle exhaust) and volatile organic compounds (from paints, solvents, printing inks, petroleum products, vehicles, etc.) interact in the presence of sunlight.
- Its occurrences are often linked to heavy traffic, high temperatures, and calm winds. During the winter, wind speeds are low and cause the smoke and fog to stagnate near the ground; hence pollution levels can increase near ground level.
- It is usually formed in summer months during afternoon when there is bright sunlight for photochemical reactions to take place. Hence it is also known as 'summer smog'.

QUESTION 22.

Increased level of carbon dioxide in the atmosphere would impact the plants in which of the following ways?

1. Proliferation of weeds.
2. Increase in number of insects and other pests.
3. A decrease in photosynthetic productivity of plants.

Select the correct answer using the code given below.

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



Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Impact of Increased Carbon Dioxide on Plants

· Weeds may proliferate rapidly and that too at the expense of useful plants. **(Hence statement 1 is correct)**

· Insects and other pests that feed on plants may also increase in number. Survival of other organisms gets affected. Elevated CO₂ can increase levels of simple sugars in leaves and lower their nitrogen content. **(Hence statement 2 is correct)**

· These can increase the damage caused by many insects, who will consume more leaves to meet their metabolic requirements of nitrogen. Thus, any attack will be more severe

· Increased CO₂ concentration in the atmosphere may increase photosynthetic productivity of plants due to increased rate of metabolic activity. This in turn produces more organic matter. **(Hence statement 3 is incorrect)**

QUESTION 23.

Consider the following statements related to the role of Arsenic in ground water pollution:

1. It is an odorless and tasteless contaminant.
2. Arsenic in ground water is caused by natural geological processes.
3. Arsenic in groundwater is highly toxic in its organic form.
4. Arsenic as a natural component of the earth's crust is scarcely distributed throughout the environment.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:**Arsenic Contamination**

- Arsenic, which is odorless and tasteless, enters water supplies from natural deposits in the Earth or from agricultural and industrial practices. **(Hence statement 1 is correct)**
- Arsenic in ground water is a geogenic contaminant i.e. caused by natural geologic processes and is highly toxic in its inorganic form. **(Hence statement 2 is correct and 3 is incorrect)**
- Arsenic as a natural component of the earth's crust is very widely distributed throughout the environment. **(Hence statement 4 is incorrect)**
- The contamination of a drinking water source by arsenic can result from either natural or human activities.
- Arsenic is an element that occurs naturally in rocks and soil as geogenic, water, air, plants, and animals. Volcanic activity, the erosion of rocks and minerals, and forest fires are natural sources that can release arsenic into the environment.
- Arsenic (As) is introduced into soil and groundwater during weathering of rocks and minerals followed by subsequent leaching and runoff. It can also be introduced into soil and groundwater from anthropogenic sources.

QUESTION 24.

Consider the following statements with reference to Radiative Forcing:

1. It is the change in net radiation caused by changes in the concentration of greenhouse gas.
2. Positive radiative forcing means that the amount of incoming solar energy is more than the number of radiations going out.
3. Negative radiative forcing means that the amount of outgoing energy is less than the amount of incoming energy.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Radiative Forcing and Global Warming

· Earth receives solar energy in multiple wavelengths. A significant part of this energy is either reflected or dissipated in the atmosphere, rest is absorbed by the earth's surface. This energy warms the surface and the air near the surface. In the due process of cooling, earth radiates maximum amount of this energy back into space. Earth receives solar energy in the shorter wavelengths and radiates the longer wavelengths.

· **Net radiation:** It is defined as the difference between the solar radiation absorbed by the Earth-atmosphere system and the long-wave radiation emitted by the Earth atmosphere system to space. Net radiation influences the Earth's climate because it determines the energy available for heating the atmosphere, ocean and land. Hence net radiation influences the seasonal variation of rainfall and the strength of the global circulation patterns.

· **Radiative Forcing:** The change in net radiation caused by changes in the concentration of greenhouse gas or aerosol concentrations is called Radiative forcing or climate forcing. It is quantified at tropopause or the zone between troposphere and the stratosphere. **(Hence statement 1 is correct)**

The unit of radiative forcing is watts per square meter of the Earth's surface. It is observed in two different trends:

· **Positive radiative forcing:** It means that the amount of incoming solar energy is more than the number of radiations going out. It warms the earth atmosphere system. **(Hence statement 2 is correct)**

· **Negative radiative forcing:** It means that the amount of outgoing energy is more than the amount of incoming energy. It cools the earth-atmosphere system. **(Hence statement 3 is incorrect)**

QUESTION 25.

Consider the following statements about Oil spills:

1. Oil spills decreases the level of dissolved oxygen in water killing marine organisms.
2. Oil Spills being more viscous in nature tend to spread slowly in the environment thus cleaning up is easier.
3. Oil spills can be controlled by chemical dispersion and combustion.

How many of the given statements is/are correct?

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

Correct Answer: B



Your Answer: Unanswered

Marks: 0/1.00

Explanation**Solution (b)****Explanation:****Oil Spills**

· Oil spills include any spill of crude oil or oil distilled products (e.g., gasoline, diesel fuels, jet fuels, kerosene, Stoddard solvent, hydraulic oils, and lubricating oils) that can pollute the surface of the land, air, and water environments and living organisms, including humans, due to the environmental discharge of various organic compounds that make up crude oil and oil distillate products, the majority of which include various individual hydrocarbons.

· Oil has a lower density than water. The average density of oil is about 0.8 gm/cm³ while water is about 1.0 gm/cm³. Lower density floats on high density. As Oil is lighter than water it floats on water and prevents sunlight to pass through it. As oil floats on water, it forms a thin layer on the surface thus gradually reducing the oxygen supply to lower levels and reducing the dissolved oxygen available to plants and animals. **(Hence statement 1 is correct)**

· **Effect on Human health:** Inhalation of vapor, touching oil slicks and consuming contaminated sea food may cause neurological, acute toxic effects, ocular (eye) and also problems of respiratory system. Ingestion of oil in sea food also impacts the food web. Creation of oil sinks is also a major setback.

· **Effect on Economy:** The second major effect of the oil spill is seen on the economy. When precious crude oil or refined petroleum is lost, it effects the amount of petroleum and gas available for use. This means more barrels have to be imported from other countries. Then comes the process of cleaning the oil spill, which requires a lot of financing. Although the company responsible for the oil spills and their effects has to clean it up, there is a lot of government help required at this point.

· **Effect on Tourism Industry:** The local tourism industry suffers a huge setback as most of the tourists stay away from such places. Dead birds, sticky oil and huge tar balls become common sight. Due to this, various activities such as sailing, swimming, rafting, fishing, parachute gliding cannot be performed. Industries that rely on sea water to carry on their day-to-day activities halt their operations till it gets cleaned.

Methods to clean oil spill:

Oil Spills are very difficult to control as oil tends to spread very fast affecting a large area over shorter time. Their impact is detrimental to the subjected environment (land, water, air). Oil films retard the dissolved oxygen and decreases light penetration. **(Hence statement 2 is incorrect)**

· **Containment Booms:** Scientists use booms or floating barriers to restrict oil from spreading into the ocean. This also helps in quick removals and dispersal of oil.

· **Skimmers:** Skimmers are devices used to separate spilled oil from the water surface.

· **Sorbents:** Sorbents like volcanic ash, straw and polyester-derived plastic shavings help absorb oil from water.

· **Dispersing Agents:** Chemicals that contain compounds or surfactants that break oil into tiny droplets are used to clean the water bodies.

· **In situ burning:** Freshly spilled oil is ignited while it's still floating on the water. **(Hence statement 3 is correct)**

QUESTION 26.

Consider the following chemicals related to disinfection of water:

1. Chlorine
2. Chloramine
3. Chlorine dioxide
4. Ozone

How many of the above chemicals are used for disinfection of water?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Disinfection of water

Disinfection is accomplished both by filtering out harmful micro-organisms and also by adding disinfectant chemicals. Water is disinfected to kill any pathogens which pass through the filters and to provide a residual dose of disinfectant to kill or inactivate potentially harmful micro-organisms in the storage and distribution systems.

Chlorine, Chloramine, Chlorine dioxide, Ozone and UV rays are commonly used as water disinfectant. The most common disinfection method involves some form of chlorine or its compounds such as chloramine or chlorine dioxide.

· **Chlorine** is a strong oxidant that rapidly kills many harmful micro-organisms. Because chlorine is a toxic gas, there is a danger of a release associated with its use.

· **Chloramines** are a group of chemical compounds that contain chlorine and ammonia. The particular type of chloramine used in drinking water disinfection is called monochloramine. Monochloramine is mixed into water in levels that kill germs but are still safe to drink.

· **Chlorine dioxide** is a faster-acting disinfectant than elemental chlorine. It is relatively rarely used, because in some circumstances it may create excessive amounts of chlorite, which is a by-product regulated to low allowable levels in the United States. The use of chloramine is becoming more common as a disinfectant. Although chloramine is not as strong an oxidant, it does provide a longer-lasting residual than free chlorine and it will not readily form tri-halomethanes (THMs) or halo acetic acids.

· **Ozone** is an unstable molecule which readily gives up one atom of oxygen providing a powerful oxidizing agent which is toxic to most waterborne organisms. It is a very strong, broad-spectrum disinfectant that is widely used in Europe.

· **Ultraviolet light (UV)** is very effective at inactivating cysts, in low turbidity water. UV light's disinfection effectiveness decreases as turbidity increases, a result of the absorption, scattering, and shadowing caused by the suspended solids.

QUESTION 27.

The "Blue Growth Initiative" supports the development of aquatic resources and the communities that depend on them. Today, innovators across the globe are coming up with new and exciting ways to harness the ocean's resources sustainably, from blue fish fashion to the medical use of fish skin. These creative inventions offer potential alternative income generating opportunities for fisheries communities worldwide.

This is an initiative of-

- a) Food and Agriculture Organization
- b) United Nations Environment Program
- c) United Nations Educational, Scientific and Cultural Organization
- d) Intergovernmental Panel on Climate Change

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

The Blue Growth Initiative (BGI) is **FAO** 's model for sustainably developing fisheries and aquaculture. The BGI differs from business-as-usual fisheries and aquaculture development, which historically focused on single interests, such as producing more fish for consumption or generating more income for livelihoods. The concept of Blue Growth is similar in many respects to that of the Blue Economy—a concept that came out of Rio +20—in that both centre on the pillars of sustainable development: environmental, economic, and social.

QUESTION 28.

'Arctic Amplification' usually refers to greater climate change near the pole as compared to the rest of the hemisphere or globe. What are the reasons for this phenomenon?

1. Ice-Albedo Feedback
2. Lapse Rate Feedback
3. Water Vapour Feedback
4. Ocean Heat Transport

Select the correct answer using the code given below:

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Arctic (or polar) Amplification (PA)

- The ratio of warming differential between the poles (polar warming) & the tropics (tropical warming) is known as Arctic (or polar) Amplification.
- Simply saying the Arctic region is warming faster than other parts of the globe. Arctic's average annual temperature rose by 3.1°C between 1971 & 2019, compared to 1°C for the planet.
- Arctic Amplification (AA) occurs whenever there is any change in the Net Radiation Balance, which is slightly higher in the Arctic compared to tropical areas. Net Radiation Balance is the balance between incoming & outgoing energy at the top of the atmosphere.

Causes of Arctic amplification

- **Global warming:** The long-term heating of the earth's surface, expedited due to anthropogenic forces since pre-industrial times and has increased the planet's average temperature by 1.1 degrees Celsius.
- **Ice-albedo feedback :** Sea ice and snow have high albedo implying that they are capable of reflecting most of the solar radiation as opposed to water and land.
- As the sea ice melts, the Arctic Ocean will be more capable of absorbing solar radiation, thereby driving the amplification.

· **Lapse rate feedback:** The lapse rate or the rate at which the temperature drops with elevation decreases with warming.

· **Water vapour feedback:** The heat-trapping effect of water in the air validates the role of the gas as a critical component of climate change.

· **Ocean heat transport:** The ocean transports vast amounts of heat around the planet, helping to regulate regional climate.

· Enhanced ocean heat transport into the Arctic is linked to stronger future Arctic warming and polar amplification.

Reason for the Arctic warming more rapidly

· Change in Albedo: Amplification is primarily caused by melting polar ice, which is increasing in the Arctic at a rate of 13% per decade. Ice is more reflective of sunlight (high albedo) than land or ocean. When ice melts, it typically reveals darker areas, & this results in increased sunlight absorption (low albedo) & associated warming.

· Melting sea ice also releases greenhouse gases from thawing permafrost & frozen methane from the ocean bottom & further intensifies Amplification.

Why is PA much stronger in the Arctic than in Antarctica?

· This is because the Arctic is an ocean covered by sea ice, while Antarctica is an elevated continent covered in more permanent ice & snow. In fact, the Antarctic continent has not warmed in the past seven decades, despite a steady increase in the atmospheric concentrations of GHGs.

Possible effects of Arctic warming

· The most obvious impact will be a sea-level rise globally. Arctic permafrost thaw has significant implications for global climate because the thawing process releases carbon dioxide & methane, which has the potential to cause even further warming (positive feedback). The most significant effect of Arctic amplification is its impact on mid-latitude climate, as well as the occurrence of extreme events. It affects mid-latitude climate by:

o Weakening of the tropospheric Jet Stream (will contribute to an increase in unusual & extreme weather in the mid-latitudes).

o Weakening of the stratospheric polar vortex (which results in extreme weather events in the mid-latitudes).

Warming Arctic Ocean Increasing Snowfall in Siberia

· This is because the warming of the Arctic Ocean has enhanced the evaporation rate, and more moisture is deposited in the Arctic atmosphere. This increased moisture journeys towards northern Eurasia and causes increased snowfall there (particularly in Siberia).

QUESTION 29.

Consider the following pairs with respect to Bioremediation Strategies:

1. Bioventing: ex-situ method of treating soils contaminated by petroleum hydrocarbons.
2. Biopiles: Hybrid of land farming typically used for treatment of surface contamination with petroleum hydrocarbons.
3. Bioaugmentation: Microorganisms are imported to a contaminated site to enhance degradation process.
4. Bioleaching: use of microorganisms in extraction of metals from their ores.

How many of the above pairs are correctly matched?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Bioremediation

- Bioremediation is the use of microorganisms (bacteria and fungi) to degrade the environmental contaminants into less toxic forms.
- The microorganisms may be indigenous to a contaminated area or they may be isolated from elsewhere and brought to the contaminated site.

Bioremediation Strategies

In situ bioremediation techniques

- It involves treatment of the contaminated material at the site.
 - o **Bioventing:** supply of air and nutrients through wells to contaminated soil to stimulate the growth of indigenous bacteria. It is used for simple hydrocarbons and can be used where the contamination is deep under the surface. **(Hence pair 1 is incorrect)**
 - o **Biosparging:** Injection of air under pressure below the water table to increase groundwater oxygen concentrations and enhance the rate of biological degradation of contaminants by naturally occurring bacteria.
 - o **Bioaugmentation:** Microorganisms are imported to a contaminated site to enhance degradation process. **(Hence pair 3 is correct)**
 - o **Bioleaching:** It is the extraction of metals from their ores through the use of living organisms. This is much cleaner than the traditional heap leaching using cyanide. **(Hence pair 4 is correct)**

Ex situ bioremediation techniques

- Ex situ -involves the removal of the contaminated material to be treated elsewhere.
- o **Land farming:** contaminated soil is excavated and spread over a prepared bed and periodically tilled until pollutants are degraded. The goal is to stimulate indigenous biodegradative microorganisms and facilitate their aerobic degradation of contaminants.
- o **Biopiles:** it is a hybrid of land farming and composting. Essentially, engineered cells are constructed as aerated composted piles. Typically used for treatment of surface contamination with petroleum hydrocarbons. **(Hence pair 2 is correct)**
- o **Bioreactors:** it involves the processing of contaminated solid material (soil, sediment, sludge) or water through an engineered containment system.
- o **Composting:** dealt earlier in solid waste management

QUESTION 30.

What is 'Phytoremediation'?

- a) The use of plants to remove contaminants from the environment.
- b) The process of converting sunlight into chemical energy in plants.
- c) The study of plant genetics and breeding.
- d) The process of extracting minerals from plants for industrial use.

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Phytoremediation

- Living plants are used in phytoremediation technologies to clean up soil, air, and water that have been contaminated with dangerous pollutants.
- It's defined as "the employment of green plants and associated microbes, as well as appropriate soil amendments and agronomic techniques, to either contain, remove, or render harmful environmental toxins harmless."
- Many plants, including mustard, alpine pennycress, hemp, and pigweed, have demonstrated their ability to hyperaccumulate toxins at toxic waste sites.
- Phytoremediation has been used successfully to recover abandoned metal mine workings, sites where polychlorinated biphenyls were deposited during manufacturing, and mitigation of continuing coal mine discharges, decreasing pollutants in soils, water, and air.

· Metals, pesticides, solvents, explosives, and crude oil and its derivatives have all been reduced through phytoremediation operations around the world.

QUESTION 31.

With reference to impacts of fertilizers use on environment, consider the following statements:

1. Nitrogen fertilizers are water soluble and can remain in groundwater for long time.
2. Urea contributes to acid rain, groundwater contamination and ozone depletion.
3. Nitrate contaminated water leads to blue baby syndrome and west Nile virus.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Impacts of fertilizers use on Environment

· Fertilizer is any substance used to add nutrients to the soil to promote soil fertility and increase plant growth.

· The biggest issue facing the use of chemical fertilizers is groundwater contamination. Nitrogen fertilizers break down into nitrates and travel easily through the soil. Because it is water-soluble and can remain in groundwater for decades, the addition of more nitrogen over the years has an accumulative effect. **(Hence statement 1 is correct)**

· One popular fertilizer, urea, produces ammonia emanation, contributes to acid rain, groundwater contamination and ozone depletion due to release of nitrous oxide by denitrification process. **(Hence statement 2 is correct)**

· Excessive air and water-borne nitrogen from fertilizers may cause respiratory ailments, cardiac disease, and several cancers, as well as can "inhibit crop growth, increase allergenic pollen production, and potentially affect the dynamics of several vector-borne diseases, including West Nile virus, malaria, cholera and blue baby syndrome. **(Hence statement 3 is correct)**

· The risk most often occurs when infants are given formula reconstituted with nitrate contaminated water. The condition causes a decrease in oxygen in the blood and results in a blue-grey skin color, causes lethargy and/or irritability and can lead to coma or death.

QUESTION 32.

Which of the following impurities are found in groundwater?

1. Arsenic from smelting processes.
2. Fluoride from municipal water supplies.
3. Lead from industry & mining.
4. Nitrate from agricultural fields.

Choose the correct answer using the code given below:

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

Correct Answer: D

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (d)**Explanation:****Impurities in ground water**

- **Arsenic:** comes from industries, smelting processes, it increases toxicity and causes liver and kidney damage.
- **Fluoride:** comes from municipal water supplies, agricultural fields, causes crippling bone disorder.
- **Lead:** comes from industry & mining, causes disruption in mental and physical development and disorder for babies.
- **Nitrate:** comes from agricultural fields, causes toxicity and blue baby diseases.

QUESTION 33.

Which of the following best represents sustainable agricultural practices?

1. Permaculture
2. Hydroponics

3. Cover crops

4. Biodynamic

Choose the correct answer using the given code below:

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Sustainable Agricultural Techniques

- Permaculture is a design system that applies principles that are found in nature to the development of human settlements, allowing humanity to live in harmony with the natural world. Permaculture design techniques include herb spirals, keyhole and mandala gardens, sheet mulching, growing grain without tillage.
- In hydroponic systems, crops are grown with the roots directly in a mineral solution or with the roots in an inert medium like gravel or perlite. Aquaponics combines the raising of aquatic animals (such as fish) with the growing of hydroponic crops.
- By planting cover crops, such as clover or oats, the farmer can achieve his goals of preventing soil erosion, suppressing the growth of weeds, and enhancing the quality of the soil. The use of cover crops also reduces the need for chemicals such as fertilizers.
- Bio dynamics emphasizes the importance of reducing the use of off-site inputs (such as importing soil fertility) by generating the necessary health and fertility for food production onsite.

QUESTION 34.

What is 'Buffering' in the context of eliminating the sources of pollution?

- a) It is a process of destroying the pollutants by thermal or catalytic combustion.
- b) It is the practice of adding a neutralizing agent to the acidified water to increase the pH.
- c) It is a treatment of sewage water and the industrial effluents before releasing it into water bodies.
- d) It decreases the amount of ammonia in the soil by increasing the rate of decomposition.

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

**Explanation****Solution (b)****Explanation:****Buffering**

The practice of adding a neutralizing agent to the acidified water to increase the pH is one of the important control measures to eliminate the sources of pollution. This is known as Buffering.

Usually, lime in the form of calcium oxide and calcium carbonate is used. **(Hence option (b) is correct answer)**

QUESTION 35.

Consider the following statements with reference to the algae in water system:

1. Algal blooms may occur in freshwater as well as marine environments.
2. Create dead zones in the water.
3. It impacts taste and odor of the water.
4. Produces slime growths on intake pipes and equipment.

How many of the following is/are the impact(s) of algae on water system?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation**Solution (d)****Explanation:****Algae**

· Algae are photosynthetic microorganisms that are found in most aquatic habitats. Algae love runoff nutrients, and an algae bloom occurs when nutrient pollution and lots of sunlight create a rapid increase in the density of the algae. Algal blooms may occur in freshwater as well as marine environments. **(Hence statement 1 is correct)**

· When an algae bloom does happen, the stream, river, lake, or ocean becomes covered with algae, creating a thick mat of surface scum. Bright green colored blooms develop from cyanobacteria, which are also known as blue-green algae.

Impact of Harmful Algal Bloom (HAB) are:**Public Health Concerns:**

- Exposure to algal toxins may occur through consumption of tainted water, fish, or shellfish; recreational activities; or inhalation of aerosolized toxins.
- Algal toxins are known to cause illness immediately (hours to days) after exposure. In addition, several algal toxins are believed to be carcinogens or to promote tumour growth, although more research on the effects of long-term exposure is needed.

Ecologic Concerns:

- HABs may impart a distinct colour to the water bodies. Colors observed are green, yellowish-brown, or red. Bright green blooms may also occur. These are a result of blue-green algae, which are actually bacteria (cyanobacteria).
- HABs may cause mortality of aquatic organisms because of low dissolved oxygen or algal toxins. Algal toxins also may cause mortality of terrestrial organisms using the water source.
- As more algae and plants grow, others die. This dead organic matter becomes food for bacteria that decompose it. With more food available, the bacteria increase in number and use up the dissolved oxygen in the water. When the dissolved oxygen content decreases, many fish and aquatic insects cannot survive. This results in a dead area. **(Hence statement 2 is correct)**

Economic Concerns:

- Economic concerns associated with HABs include increased drinking-water treatment costs, loss of recreational revenue, loss of aqua cultural and fisheries revenue, and livestock sickness or fatalities.
- Taste-and-odour compounds are of particular concern to drinking-water suppliers because of customer dissatisfaction with malodorous drinking water. **(Hence statement 3 is correct)**
- Also, algae may clog filters, and produce nuisance slime growths on intake pipes and equipment. **(Hence statement 4 is correct)**

QUESTION 36.

Consider the following statements with respect to the Biochemical Oxygen Demand (BOD)?

1. It is the amount of dissolved oxygen needed by bacteria in decomposing the organic waste present in water.
2. It is expressed in milligrams of oxygen per liter of water.
3. The higher value of BOD indicates the low Dissolved Oxygen content of water.

How many of the given statements is/are correct?

- a) Only one

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Biochemical Oxygen Demand (BOD)

- Water pollution by organic wastes is measured in terms of Biochemical Oxygen Demand (BOD).
- Biochemical oxygen demand is the amount of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic conditions.
- It is expressed in milligrams of oxygen per liter of water.
- The higher value of BOD indicates the low Dissolved Oxygen content of water.
- Since BOD is limited to biodegradable materials only. Therefore, it is not a reliable method of measuring the pollution load in the water.

Chemical Oxygen Demand (COD)

- It is a slightly better mode used to measure pollution load in the water.
- It is the measure of oxygen equivalent of the requirement of oxidation of total organic matter (i.e. biodegradable and non-biodegradable) present in water.

QUESTION 37.

Consider the following statements with reference to economic output from inland fishery:

1. Discharge of untreated effluents from the industrial units and urban silage which destroy the fish.
2. Construction of dams prevents the free migration of fish to their usual breeding and feeding grounds.
3. Deforestation and frequent flooding due to poor watershed management.

How many the following activities is/are responsible for the decrement in the economic output from inland fishery?

- a) Only one
- b) Only two

- c) All three
d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Inland Fishery

The reasons for the decrement in the economic output from inland fishery:

· Discharge of untreated effluents from the industrial units and urban silage destroy the fish by clogging their respiratory organs. Also, fish exposed to industrial effluent induce a greater risk of oxidative stress with a resultant increased level of lipid peroxides. Consequently, if these fish with increased oxidative species are ingested by humans, they may cause physiological problems such as cardiovascular diseases and cancer involving disruption of cellular homeostasis. **(Hence statement 1 is correct)**

· Construction of dams, reservoirs prevent the free migration of fish to their usual breeding and feeding grounds and thus adversely affects the stock of fish in rivers. Also, water temperature changes have often been identified as a cause of reduction in native species, particularly as a result of spawning success .eg: Coldwater release from high dams of the Colorado River has resulted in a decline in native fish abundance. **(Hence statement 2 is correct)**

· Deforestation leads to loosening of soil thus facilitating frequent flooding in cases of poor watershed management. In some cases, floods lead to a decline in fish population. In these situations, fewer young fish survive than normal, as the offspring are isolated by the retreating waters after the flood. But such declines are more common in faster moving rivers. **(Hence statement 3 is correct)**

QUESTION 38.

What is the government's target for ethanol blending by 2030 under the EBP Programme?

- a) 5% blending
b) 10% blending
c) 15% blending
d) 20% blending

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Ethanol Blended Petrol (EBP) Programme:

- Renewable Fuel Promotion: The Ethanol Blended Petrol Programme was initiated in 2003 to encourage the use of renewable and eco-friendly fuels, reducing India's reliance on imports for energy security.
- Blending Targets: The government aims to achieve 10% ethanol blending by 2022 and **20% blending (E20) by 2030**, starting from an initial 5% blending. **(Hence option d) is correct)**
- Implementation Framework: The programme is implemented in accordance with the National Policy on Biofuels, with oil marketing companies (OMCs) procuring ethanol from domestic sources at government-fixed prices.
- Expansion of Feedstocks: Initially derived mainly from sugarcane, the programme now includes foodgrains like maize, bajra, and fruit and vegetable waste, broadening the base for ethanol production and enabling farmers to earn additional income.
- Benefits of Ethanol Blending: Ethanol, being a biofuel derived from organic matter, is renewable and has a higher oxygen content, resulting in more thorough combustion and reduced vehicular emissions, contributing to a lower carbon footprint.
- Economic Savings: Blending 20% ethanol in petrol has the potential to reduce the annual auto fuel import bill by \$4 billion or Rs 30,000 crore.
- Additional Income for Farmers: Ethanol blending provides an extra source of income for farmers, as they can sell surplus produce to ethanol blend manufacturers, benefiting both farmers and the ethanol industry.

QUESTION 39.

Consider the following statements regarding Radioactive Pollution:

1. Non-Ionising radiations are short-wave radiations such as ultraviolet rays.
2. Ionising radiations have low penetrating power and affect the cells and molecules which absorb them.
3. Ionising radiations include X-rays, cosmic rays and atomic radiations.

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

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

Correct Answer: B

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (b)**Explanation:****Radioactive Pollution**

Radioactivity is a phenomenon of spontaneous emission of proton (α -particles), electrons (β -particles) and gamma rays (short wave electromagnetic waves) due to disintegration of atomic nuclei of some elements. These cause radioactive pollution.

Two types of radiations with regard to the mode of their action on cells

Non-Ionising Radiations

- They include short-wave radiations such as ultraviolet rays, which form a part of solar radiation. **(Hence statement 1 is correct)**
- They have low penetrating power and affect the cells and molecules which absorb them.
- They damage eyes which may be caused by reflections from coastal sand, snow (snow blindness) directly looking towards the sun during an eclipse.
- They injure the cells of skin and blood capillaries producing blisters and reddening called sunburns.

Ionizing Radiations

- They include X-rays, cosmic rays and atomic radiations (radiations emitted by radioactive elements). **(Hence statement 3 is correct)**
- Ionizing radiations have high penetration power and cause breakage of macromolecules. **(Hence statement 2 is incorrect)**
- The molecular damage may produce short-range (immediate) or long-range (delayed) effects.
- Short-range effects include burns, impaired metabolism, dead tissues and death of the organisms.
- Long-range effects are mutations that increased the incidence of tumors and cancer, shortening of life-span and developmental changes.
- The mutated gene can persist in living organisms and may affect their progeny.
- The actively dividing cells such as Embryo, foetus, cells of the skin, intestinal lining, bone marrow, and gamete forming cells are more sensitive to radiations.
- Some species of animals and plants preferentially accumulate specific radioactive materials. For example, oysters deposit ^{65}Zn , fish accumulate ^{55}Fe , marine animals selectively deposit ^{90}Sr .

QUESTION 40.

Consider the following with reference to source of 'Radioactive Pollution':

1. Terrestrial radiations from radio-nuclides present in earth's crust.
2. Uranium mining
3. Radiation therapy
4. Transportation of nuclear material

How many of the above is/are man-made sources of Radioactive Pollution?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Radioactive Pollution

Radioactivity is a phenomenon of spontaneous emission of proton (α -particles), electrons (β -particles) and gamma rays (short wave electromagnetic waves) due to the disintegration of atomic nuclei of some elements. These cause radioactive pollution.

Types of Radiations

- Non-ionising radiations affect only those components which absorb them and have low penetrability.
- Ionising radiations have high penetration power and cause breakage of macro molecules.

Types of radiation particles

- Alpha particles, can be blocked by a piece of paper and human skin.
- Beta particles can penetrate through skin, while can be blocked by some pieces of glass and metal.
- Gamma rays can penetrate easily to human skin and damage cells on its way through, reaching far, and can only be blocked by a very thick, strong, massive piece of concrete.

Sources

Natural

They include cosmic rays from space and terrestrial radiations from radio-nuclides present in earth's crust such as **(Hence 1 is incorrect)**



- radium-224
- uranium-238
- thorium-232
- potassium- 40
- carbon-14, etc.

Man-made

- Nuclear power plants
- Nuclear weapon
- Transportation of nuclear material (**Hence 4 is correct**)
- Disposal of nuclear waste
- Uranium mining (**Hence 2 is correct**)
- Radiation therapy (**Hence 3 is correct**)

QUESTION 41.

Consider the following statements with respect to United Nations Environmental Programme (UNEP):

1. It coordinates UN's environmental activities, assisting developing countries in implementing environmentally sound policies and practices.
2. It was founded as a result of the Stockholm Conference in 1972.
3. It's headquartered at Geneva, Switzerland.
4. UNEP facilitates the transfer of knowledge and technology for sustainable development.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:**United Nations Environment Programme (UNEP)**

· The United Nations Environment Programme (UNEP) was initiated in 1972 to manage and coordinate environmental processes inside the UN system. The UNEP promotes global alliance and cooperation on environmental concerns, directs the United Nations bodies, and encourages the worldwide scientific society to formulate policies for several of the United Nations' environmental programmes by way of its scientific consultative commissions. **(Hence statement 1 is correct)**

· The UNEP headquarters are situated in Nairobi, Kenya. **(Hence statement 3 is incorrect)**

The working area of UNEP is divided into seven broad thematic areas:

o Climate change

o Disasters and conflicts

o Ecosystem management

o Environmental governance

o Chemicals and waste

o Resource efficiency

o Environment under review maintaining the overarching commitment to sustainability in all its work.

· It was founded by Maurice Strong, its first director, as a result of the United Nations Conference on the Human Environment (Stockholm Conference) in June 1972 and has overall responsibility for environmental problems among United Nations agencies but international talks on specialized issues, such as addressing global warming or combating desertification, are overseen by other UN organizations. **(Hence statement 2 is correct)**

· UN Environment has aided in the formulation of guidelines and treaties on issues such as the international trade in potentially harmful chemicals, trans boundary air pollution, and contamination of international waterways. Relevant documents, including scientific papers, are available via the UNEP Document Repository.

UNEP work encompasses

· Assessing global, regional and national environmental conditions and trend

· Developing international and national environmental instruments

· Strengthening institutions for the wise management of the environment

· Facilitating the transfer of knowledge and technology for sustainable development **(Hence statement 4 is correct)**

QUESTION 42.

Consider the following pairs with respect to pollutants and its health effects:

1. Lead: Kidney problems
2. Arsenic: Thickening and discoloring of skin
3. Nitrate: Baby Blue Syndrome
4. Fluoride: Knock knee Syndrome

How many of the above pairs are correctly matched?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Health Effects of Pollutants

- Lead comes from mining, batteries, electronic devices, etc. It can be leached from metal pipes to ground water. It affects kidney and mental growth.
- Arsenic is a very serious pollutant in water. It is found in earth's crust. It can be leached to groundwater through rock formations. It results into thickening and discolouration of skin, stomach pain, diarrhoea, etc.
- Baby Blue Syndrome is the result of nitrate contamination.
- Fluoride pollution will result into Knock knee syndrome where knee joints stiffness and pain in bones.

(Hence all the pairs are correctly matched)

QUESTION 43.

Consider the following statements with respect to Alga-culture:

1. Nitrogen, phosphorus, and potassium serve as fertilizer for algae.
2. Algae store energy in the form of oils and carbohydrates thus leading to high yield of bio-fuels.

3. Algae consume CO₂ thus reduces greenhouse gases.

4. Algae thrive in nutrient-rich waters like municipal waste waters and can help in its purification.

How many of the given statements is/are correct?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Alga culture

· Alga-culture is a form of aquaculture involving the farming of species of algae. The majority of algae that are intentionally cultivated fall into the category of microalgae (also referred to as phytoplankton, micro-phytes, or planktonic algae). Macro-algae, are commonly known as seaweed.

· Water, carbon dioxide, minerals and light are all important factors in cultivation, and different algae have different requirements.

· Nutrients such as nitrogen, phosphorus, and potassium serve as fertilizer for algae, and are generally necessary for growth. Silica and iron, as well as several trace elements, may also be considered important marine nutrients as the lack of one can limit the growth of, or productivity in, a given area. **(Hence statement 1 is correct)**

· Algae can also be grown in a photo bioreactor (PBR). A PBR is a bioreactor which incorporates a light source. Virtually any translucent container could be called a PBR however, the term is more commonly used to define a closed system, as opposed to an open tank or pond.

· Algae can double their numbers every few hours, can be harvested daily, and have the potential to produce a volume of biomass and biofuel many times greater than that of our most productive crops. These algae store energy in the form of oils and carbohydrates, which, combined with their high productivity, means they can produce from 2,000 to as many as 5,000 gallons of biofuels per acre per year. **(Hence statement 2 is correct)**

· Like any other plant, algae, when grown using sunlight, consume (or absorb) carbon dioxide (CO₂) as they grow, releasing oxygen (O₂) for the rest of us to breathe. For high productivity, algae require more CO₂, which can be supplied by emissions sources such as power plants, ethanol facilities, and other sources, thus eventually helping in reduction of potent greenhouse gas. **(Hence statement 3 is correct)**

· Algae thrive in nutrient-rich waters like municipal waste waters (sewage), animal wastes and some industrial effluents, at the same time purifying these wastes while producing a biomass suitable for biofuels production. **(Hence statement 4 is correct)**

QUESTION 44.

With reference to the landfills, consider the following statements:

1. Landfills give rise to air pollution and water pollution.
2. Sanitary landfill uses a clay liner to isolate the trash from the environment.
3. Incineration involves the combustion of organic substances contained in waste materials.

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

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Waste Management

· Waste management or Waste disposal refers to all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things, collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling etc. Throwing daily waste/garbage in the landfills is the most popularly used method of waste disposal used today. This process of waste disposal focuses attention on burying the waste in the land.

· Landfills are commonly found in developing countries. This method is becoming less these days owing to the lack of space available and the strong presence of methane and other landfill gases, both of which can cause numerous contamination problems. **Landfills give rise to air and water pollution which severely affects the environment and can prove fatal to the lives of humans and animals.** When organic material such as food scraps and green waste is put in landfill, it is generally compacted down and covered. This removes the oxygen and causes it to break down in an anaerobic process. Eventually this releases methane, a greenhouse gas that is 25 times more potent than carbon dioxide polluting the air around itself. Similarly, the leachate contaminates the groundwater sources. **(Hence statement 1 is correct)**

· **A sanitary landfill uses a clay liner to isolate the trash from the environment .** A municipal solid waste (MSW) landfill uses a synthetic (plastic) liner to isolate the trash from the environment. Combustion of organic substances contained in waste materials is not involved in the process. **(Hence statement 2 is correct)**

· **Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials.** Incineration and other high-temperature waste treatment systems are described as “thermal treatment”. Incineration of waste materials converts the waste into ash, flue gas and heat. **(Hence statement 3 is correct)**

QUESTION 45.

Which of the following Conventions created legal binding obligations for the implementation of the Prior Informed Consent (PIC) procedure regarding certain hazardous chemicals?

- a) Rotterdam Convention
- b) Basel Convention
- c) Stockholm Convention
- d) Minamata Convention

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Rotterdam Convention

· It was adopted in 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands and entered into force on 24 February 2004.

· The Convention created legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It built on the voluntary PIC procedure, initiated by UNEP and FAO in 1989 and ceased on 24 February 2006.

· **The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure.**

Objectives:

· To promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm;

· To contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export and by disseminating these decisions to Parties.

(Hence option (a) is correct answer)

QUESTION 46.

Consider the following factors with respect to 'Soil Pollution':

1. Indiscriminate use of fertilizers.
2. Dumping of solid waste
3. Deforestation

How many of the above factors is/are responsible for soil pollution?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Soil Pollution

- Soil is a thin layer of organic and inorganic materials that covers the Earth's rocky surface. Soil pollution is defined as the 'addition of substances to the soil, which adversely affect physical, chemical and biological properties of soil and reduces its productivity.'
- It is build-up of persistent toxic compounds, chemicals, salts, radioactive materials, or disease-causing agents in soil which have adverse effects on plant growth, human and animal health.
- A soil pollutant is any factor which deteriorates the quality, texture and mineral content of the soil or which disturbs the biological balance of the organisms in the soil.

Causes

- Indiscriminate use of fertilizers, pesticides, insecticides and herbicides. **(Hence 1 is correct)**
- Dumping of large quantities of solid waste. **(Hence 2 is correct)**
- Deforestation and soil erosion. **(Hence 3 is correct)**
- Pollution Due to Urbanisation

Source

- **Industrial Wastes:** Industrial waste includes chemicals such as mercury, lead, copper, zinc, cadmium, cyanides, thiocyanates, chromates, acids, alkalies, organic substances etc.

- **Pesticides:** Pesticides are chemicals that include insecticides, fungicides, algicides, rodenticides, weedicides sprayed in order to improve productivity of agriculture, forestry and horticulture.
- **Fertilizers and manures:** Chemical fertilizers are added to the soil for increasing crop yield. Excessive use of chemical fertilizers reduces the population of soil borne organism and the crumb structure of the soil, productivity of the soil and increases salt content of the soil.
- **Discarded materials:** It includes concrete, asphalt, rungs, leather, cans, plastics, glass, discarded food, paper and carcasses.
- **Radioactive wastes:** Radioactive elements from mining and nuclear power plants, find their way into water and then into the soil.
- **Other pollutants:** Many air pollutants (acid rain) and water pollutants ultimately become part of the soil and the soil also receives some toxic chemicals during weathering of certain rocks.

QUESTION 47.

Consider the following statements with respect to 'Mining Pollution':

1. It leads to destruction or displacement of species in areas of excavation and piling of mine wastes.
2. It destroys landscapes which in turn lead to soil erosion and destruction of agricultural land.
3. Mine drainage can modify water pH and temperature and make the groundwater acidic.

How many of the above factors is/are impact of mining activities on the environment?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Mining Pollution

Mining is the extraction of minerals and other geological materials of economic value from deposits on the earth. Mining has the potential to have severely adverse effects on the environment including loss of biodiversity, erosion, contamination of surface water, ground water, and soil.

Effects of Mining on Environment

- Bad mining practices can ignite coal fires, which can burn for decades, release fly ash and smoke laden with greenhouse gasses and toxic chemicals. Furthermore, mining releases coal mine methane which is a greenhouse gas which affects climate change.
- It causes black lung disease among miners and those who live nearby, and mine accidents kill thousands every year.
- Cardiopulmonary disease, chronic obstructive pulmonary disease, hypertension, lung disease, and kidney disease have been found in higher-than normal rates among residents who live near coal mines.
- It destroys landscapes, forests and wildlife habitats causing displacement from the site of the mine when trees, plants, and topsoil are cleared from the mining area. Thus, it leads to soil erosion and destruction of agricultural land. **(Hence statement 1 and 2 are correct)**
- Mining sediments pollute waterways when they are washed away by rainwater.
- The fish and other smaller plant life are badly affected, and cause disfiguration of river channels and streams, which leads to flooding.
- It results in chemical contamination of ground water when minerals in upturned earth seep into the water table, and watersheds are destroyed when disfigured land loses the water it once held. It lowers the water table, changing the flow of groundwater and streams and produces also greenhouse gas emissions. **(Hence statement 3 is correct)**
- It also causes dust and noise pollution when top soil is disrupted with heavy machinery and coal dust is created in mines.
- Another type of mining called as 'Underground mining' causes huge amounts of waste earth and rock to be brought to the surface - waste that often becomes toxic when it comes into contact with air and water.
- Toxic levels of arsenic, fluorine, mercury, and selenium are emitted by coal fires, entering the air and the food chain of those living nearby.

QUESTION 48.

Consider the following statement with reference to 'Sewage' Management Steps:

1. Primary treatment: It is done to remove metals to prevent the grit from causing damage to the equipment.
2. Aeration: It creates a suitable environment for natural bacteria to digest the waste in water and form activated sludge.
3. Secondary treatment: This stage has the ability to remove up to 99 percent of the impurities from the wastewater.

How many of the given statements is/are correct?



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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Sewage Treatment Stages

· Primary treatment is done by pouring the wastewater into big tanks for the solid matter to settle at the surface of the tanks. The sludge, the solid waste that settles at the surface of the tanks, is removed by large scrapers and is pushed to the center of the cylindrical tanks and later pumped out of the tanks for further treatment. It is done to remove metals to prevent the grit from causing damage to the equipment. The remaining water is then pumped for secondary treatment. **(Hence statement 1 is correct)**

· The secondary treatment stage involves adding seed sludge to the wastewater to ensure that it is broken down further. Air is first pumped into huge aeration tanks which mix the wastewater with the seed sludge which is basically small amount of sludge, which fuels the growth of bacteria that uses oxygen and the growth of other small microorganisms that consume the remaining organic matter. This process leads to the production of large particles that settle down at the bottom of the huge tanks. **(Hence statement 2 is correct)**

· The tertiary treatment stage has the ability to remove up to 99 percent of the impurities from the wastewater. This produces effluent water that is close to drinking water quality. Unfortunately, this process tends to be a bit expensive as it requires special equipment, well trained and highly skilled equipment operators, chemicals and a steady energy supply. All these are not readily available. **(Hence statement 3 is incorrect)**

QUESTION 49.

Which of the following are major sources of e-waste used in the manufacturing of electronics?

1. Chlorinated PVC
2. Rare Earth Metals
3. Cadmium
4. Cobalt
5. Manganese

Select the correct answer using the code given below:

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Electronic waste (E-Waste)

- The discarded and end-of-life electrical and electronic equipment (EEE) and products ranging from computers, equipment, home appliances, audio and video products and all of their peripherals are known as electronic waste.
- E-waste is not hazardous if it is stocked in safe storage or recycled by scientific methods, or transported from one place to the other in parts or totality in the formal sector.
- The e-waste can, however, be considered hazardous if re-cycled or disposed of unscientifically. E-Waste Source and Health Effects

Particulars	Source
Toners	Found in the plastic printer cartridge containing black and colour toners.
Phosphor additives	The phosphor coating on cathode ray tubes contains toxic heavy metals, such as cadmium , and other rare earth metals , for example, zinc , and vanadium as additives.
PVC	Plastics, cables, computer housings and mouldings, Chlorinated PVC (Chloro-benzenes)
Phthalates	Used to soften plastics, especially PVC
Lithium	PVC stabilisers, lasers, LEDs, thermoelectric elements, circuit boards, etc. Lithium-ion batteries contain metals such as cobalt, nickel, and manganese, which are toxic.

Acid	Sulphuric and hydrochloric acids are used to separate metals from circuit boards. Fumes contain corrosive chlorine and sulphur dioxide , which cause respiratory problems.
Plastics	Found in circuit boards, cabinets and cables, they contain carcinogens.
BFR	Brominated Flame Retardants (BFR) are used in circuit boards (plastic), cables and PVC cables. BFRs give out carcinogenic brominated dioxins and furans .
PCB	Polychlorinated biphenyls (PCB) are used in transformers, capacitors, as softening agents for paint & plastics.
Selenium	Photoelectric cells, pigments, photocopiers, fax machines
Silver	Capacitors, switches (contacts), batteries, resistors
Cobalt	Insulators

(Hence all the sources are correct)

QUESTION 50.

Consider the following statements regarding the Urban Heat Island:

1. The temperature difference is often greater at night than daytime.
2. It is a phenomenon occurring due to high albedo of cities.
3. It suppresses the formation of fog.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (b)**Explanation:****Urban Heat Island**

- The urban heat island is a phenomenon when the heat gets trapped near the earth's surface as a result of a decline in green cover, rapid urbanisation, energy-intensive activities, and concrete structures.
- The phenomenon, 'Urban Heat Island' was first investigated and described by Luke Howard in the 1810s. It is highly noticeable during winter and summer periods, and the temperature difference is often greater at night than daytime. **(Hence statement 1 is correct)**
- Heat islands form in urban and suburban areas because many common construction materials absorb and retain more of the sun's heat than natural materials in less developed rural areas. Temperatures of dark, dry surfaces in direct sun can reach 88°C during the day, while vegetated surfaces with moist soil under the same conditions might reach only 18°C.
- Concrete, cement, and metal surfaces in urban areas tend to absorb heat energy rather than reflect it, contributing to higher urban temperatures.
- Cities have a low albedo, the reflecting power of a surface. The increased surface area of buildings results in more solar radiation absorption than reflection. **(Hence statement 2 is incorrect)**
- The urban heat island effect is so strong in Delhi, that it saw 50% less fog than surrounding areas. In Delhi, the heat island effect also appears to be suppressing the very formation of fog. **(Hence statement 3 is correct)**
- Population size has been shown to be related to the intensity of urban heat islands since they are an indicator of urban growth.

QUESTION 51.

Consider the following statements with respect to the Air Pollutants:

1. Primary pollutants are usually produced from a process, such as ash from a volcanic eruption.
2. Secondary pollutants are not emitted directly thus are less harmful than the primary pollutants.
3. Ground level ozone is a prominent example of a primary pollutant.

How many of the given statements is/are correct?

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

d) None

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Air Pollutants

· Air pollution occurs when harmful substances including particulates and biological molecules are introduced into Earth's atmosphere. It may cause diseases, allergies or death of humans; it may also cause harm to other living organisms such as animals and food crops, and may damage the natural or built environment. Human activity and natural processes can both generate air pollution.

· An air pollutant is a substance in the air that can have adverse effects on humans and the ecosystem. The substance can be solid particles, liquid droplets, or gases. This pollutant can be of natural origin or manmade. Pollutants are classified as primary or secondary.

· The pollutants that are emitted directly from a combustion process - or the products of combustion - are called "primary pollutants" such as ash from a volcanic eruption. Other examples include carbon monoxide gas from motor vehicle exhaust, or the sulfur dioxide released from factories. **(Hence statement 1 is correct)**

· Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. Ground level ozone is a prominent example of a secondary pollutant. Secondary pollutants are generally more harmful. **(Hence statement 2 and 3 are incorrect)**

Differences Between Primary and Secondary Pollutants	
Primary Pollutants	Secondary Pollutants
They are the pollutants which enter into the environment directly from the source	They are pollutants which develop from interaction of primary pollutant and atmospheric constituents.
They persist in the form in which they are added to the environment.	They are formed through photo chemical reactions that release nascent oxygen.
They are less potent than the secondary pollutants.	They are more potent than the primary pollutant to synergism.

QUESTION 52.

Consider the following statements related to 'Green-House Effect':

1. Clouds are effective at absorbing infrared radiation and therefore exert a large greenhouse effect.
2. Warmer global temperature cause sea level to rise due to the thermal expansion of seawater.
3. Fluorinated gases are the greenhouse gases that do not occur naturally, but have been developed by man for industrial purposes.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Greenhouse Effect

· The greenhouse effect is a natural process that warms the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by greenhouse gases. The absorbed energy warms the atmosphere and the surface of the Earth. This process maintains the Earth's temperature at around 33 degrees Celsius warmer than it would otherwise be, allowing life on Earth to exist. As this phenomenon of increase in temperature is observed in green houses, in the botanical gardens these gases are known as greenhouse gases and the heating effect is known as greenhouse effect. Together, these produce more than 95 percent of total greenhouse warming.

· An average global temperature is maintained at about 15°C due to natural greenhouse effect. Without this phenomenon, average global temperatures might have been around -17°C and at such low temperature life would not be able to exist.

· Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs).

· Oxides of Nitrogen with general formula NO_x - NO, NO₂, Nitrogen oxide, Nitrogen dioxide etc. are global cooling gasses while Nitrous oxide (N₂O) is a greenhouse gas.

· Clouds are effective at absorbing infrared radiation and therefore exert a large greenhouse effect, thus warming the Earth. Clouds are also effective at reflecting away incoming solar radiation, thus cooling the Earth. A change in almost any aspect of clouds, such as their type, location, water content, cloud altitude, particle size and shape, or lifetimes, affects the degree to

which clouds warm or cools the Earth. Some changes amplify warming while others diminish it. (**Hence statement 1 is correct**)

· Sea level can rise by two different mechanisms with respect to climate change. First, as the oceans warm due to an increasing global temperature, seawater expands taking up more space in the ocean basin and causing a rise in water level. The second mechanism is the melting of ice over land, which then adds water to the ocean. (**Hence statement 2 is correct**)

· Unlike many other greenhouse gases, fluorinated gases have no natural sources and only come from human related activities. They are emitted through a variety of industrial processes such as aluminum and semiconductor manufacturing. Fluorinated gases (F-gases) are man-made gases that can stay in the atmosphere for centuries and contribute to a global greenhouse effect. (**Hence statement 3 is correct**)

QUESTION 53.

Consider the following statements with respect to 'Black Carbon':

1. Black carbon is the result of incomplete combustion of fossil fuels, biofuel, and biomass.
2. Life time of black carbon in the atmosphere is more than 100 years.
3. It is directly emitted in the atmosphere as fine particles.
4. Black carbon warms the atmosphere by reducing albedo when deposited on snow and ice.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Black Carbon

· Black Carbon (BC) has recently emerged as a major contributor to global climate change, possibly second only to CO₂ as the main driver of change. BC particles strongly absorb sunlight and give soot its black color.

· BC is produced both naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass. Primary sources include emissions from diesel engines, cook stoves, wood burning and forest fires. (**Hence statement 1 is correct**)

· Reducing CO₂ emissions is essential to avert the worst impacts of future climate change, but CO₂ has such a long atmospheric lifetime that it will take several decades for CO₂ concentrations to begin to stabilize after emissions reductions begin. In contrast, BC remains in the atmosphere for only a few weeks, so cutting its emissions would immediately reduce the rate of warming, particularly in the rapidly changing Arctic. Moreover, reduced exposure to BC provides public health cobenefits, especially in developing countries. Technologies that can reduce global BC emissions are available today. **(Hence statement 2 is incorrect)**

· Being the strongest absorbent of light amongst all the components of particulate matter. It has the ability to reduce albedo when deposited on snow. It thus warms the region by reflecting less solar energy.

Main Properties of Black Carbon

· It is directly emitted in the atmosphere as fine particles (PM₅.) **(Hence statement 3 is correct)**

· It is highly effective in absorbing solar energy and can absorb million times more energy than Carbon Dioxide.

· It is formed of pure carbon in several linked forms.

· It is emitted in two forms-anthropogenic and soot. It is a major component of soot.

· Climatologically, it is highly active and is known as a climate forcing agent. It adds to global atmospheric heating by reducing the albedo which is the property of snow and ice to reflect sunlight. **(Hence statement 4 is correct)**

· BC emissions are largely done from automobile sources like diesel engines and other vehicles. This comprises 52% of total BC emissions. Other sources include burning of biomass, residential processes, industrial heating etc.

· Largest contributors of BC in the world are Asia, some parts of African continent and Latin America. China and India together contribute 25-30% of the total global black carbon emissions. These emissions are more intense in the source regions which include: Indo-Gangetic plains of India, Eastern China, Southeast Asia and Indonesia, Equatorial Africa, Latin America etc. A large part of people lives in these hotspots.

· It was first identified in the Arctic haze aerosols and the Arctic snow.

· It comprises about 30% of the total carbon component of soils. It serves a major reservoir of nutrients for tropical soils.

QUESTION 54.

Consider the following statements regarding the 'United Nations Framework Convention on Climate Change' (UNFCCC):

1. It is an international treaty drawn at UN Conference on Environment and Development held in Rio de Janeiro in 1992.

2. Its role is to provide a framework for negotiating specific international treaties.
3. Kyoto Protocol implemented the objectives of UNFCCC to fight global warming by reducing the concentration of greenhouse gases.

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

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

United Nations Framework Convention on Climate Change (UNFCCC)

- UN Summit Conference on Environment and Development (UNCED) held in Rio de Janeiro in June 1992 adopted, by consensus, the first multilateral legal instrument on Climate Change, the UN Framework Convention on Climate Change or the UNFCCC. **(Hence statement 1 is correct)**
- In 1992, countries joined UNFCCC, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable. There are now 195 Parties to the Convention.
- The UNFCCC secretariat supports all institutions involved in the international climate change negotiations, particularly the Conference of the Parties (COP), the subsidiary bodies (which advise the COP), and the COP Bureau (which deals mainly with procedural and organizational issues arising from the COP and also has technical functions).
- All subsequent multilateral negotiations on different aspects of climate change, including both adaptation and mitigation, are being held based on the principles and objectives set out by the UNFCCC. **(Hence statement 2 is correct)**
- Kyoto Protocol implemented the objective of the UNFCCC to fight global warming by reducing greenhouse gas concentrations in the atmosphere to a level that would prevent dangerous anthropogenic interferences with the climate system. **(Hence statement 3 is correct)**

QUESTION 55.

Consider the following statements related to following 'Environmental Treaties':

1. The Aichi targets aims at addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.

2. Nagoya Protocol aims to achieve the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

3. Cartagena Protocol aims to ensure the safe handling, transport, and use of living modified organisms resulting from modern biotechnology.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Environmental Treaties

Aichi Targets:

Aichi Targets is officially known as "Strategic Plan for Biodiversity 2011-2020". It includes:

- Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; **(Hence statement 1 is correct)**
- Goal B: Reduce the direct pressures on biodiversity and promote sustainable use;
- Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity;
- Goal D: Enhance the benefits to all from biodiversity and ecosystem services and
- Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.

None of the 20 'Aichi Biodiversity Targets' agreed on by national governments through the CBD has been met, according to CBD's Global Biodiversity Outlook 5 report.

Nagoya Protocol:

- The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD.
- Objective: Is the fair and equitable sharing of benefits arising from the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity? **(Hence statement 2 is correct)**

The Cartagena Protocol:

· The Cartagena Protocol on Biosafety to the Convention on Biological Diversity (CBD) is an international agreement adopted in 2000. It entered into force in 2003 and covers the field of biotechnology. It currently has 173 parties. India has ratified CBD and its Cartagena Protocol (signed in Cartagena, Colombia).

· Cartagena Protocol aims to ensure the safe handling, transport, and use of living modified organisms (LMOs) resulting from modern biotechnology. It addresses technology development and transfer, benefit-sharing and biosafety issues. **(Hence statement 3 is correct)**

QUESTION 56.

Consider the following statements with reference to 'The National Air Quality Monitoring Programme' (NAMP):

1. Ascertain the compliance of National Ambient Air Quality Standards (NAAQS).
2. Identify non-attainment cities.
3. Determine status and trends of ambient air quality.
4. Understand the natural process of cleaning in the atmosphere.
5. Undertake preventive and corrective measures by enforcing penalties.

How many of the given statements is/are correct objectives of the NAMP?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

National Air Quality Monitoring Programme (NAMP)

· In India, the Central Pollution Control Board (CPCB) has been executing a nationwide programme of ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). Under this programme, Central Government provides funds through CPCB for National Air Monitoring Programme to various State pollution control boards (SPCBs) and Pollution Control Committees (PCCs).

· There are six AQI categories, namely Good, Satisfactory, moderately polluted, Poor, Very Poor, and Severe.

· The proposed AQI will consider eight pollutants namely particulate matter 2.5 and 10, nitrogen and sulphur dioxide, carbon monoxide, ozone, ammonia and lead, for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed.

· As per CPCB, the objectives of the N.A.M.P. are:

o to determine status and trends of ambient air quality and compliance of National Ambient Air Quality Standards (NAAQS); **(Hence statement 1 and 3 are correct)**

o to ascertain whether the prescribed ambient air quality standards are violated;

o to Identify Non-attainment Cities; **(Hence statement 2 is correct)**

o to obtain the knowledge and understanding necessary for developing preventive and corrective measures and

o to understand the natural cleansing process undergoing in the environment through pollution dilution, dispersion, wind-based movement, dry deposition, precipitation and chemical transformation of pollutants generated. **(Hence statement 4 is correct)**

o To undertake preventive and corrective measures, not penalties. **(Hence statement 5 is incorrect)**

QUESTION 57.

Consider the following statements with respect to Fly Ash:

1. Fly ash is one of the residues generated by coal combustion.
2. Fly Ash is referred to as a residue which rises with gases into the atmosphere and tends to travel far in the air.
3. Fly Ash can be used in cement making and pavement construction.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Explanation

Marks: 0/1.00

Solution (c)

Explanation:**Fly-Ash**

· Fly ash is one of the residues generated by coal combustion, and is composed of the fine particles that are driven out of the boiler with the flue gases rises with gases into the atmosphere and tends to travel far in the air. **(Hence statement 1 and 2 are correct)**

· Depending upon the source and makeup of the coal being burned, the components of fly ash vary considerably, but all fly ash includes substantial amounts of silicon dioxide (SiO_2) (both amorphous and crystalline), aluminum oxide (Al_2O_3) and calcium oxide (CaO), the main mineral compounds in coalbearing rock strata.

· Fly ash is a fine powder which is a byproduct of burning pulverized coal in electric generation power plants. Fly ash is a pozzolan, a substance containing aluminous and siliceous material that forms cement in the presence of water. When mixed with lime and water it forms a compound similar to Portland cement. Fly ash can be used as prime material in blocks, paving or bricks; however, one of the most important applications is Plain Cement Concrete (PCC pavement). PCC pavements use a large amount of concrete and substituting fly ash provides significant economic benefits. **(Hence statement 3 is correct)**

· Major concerns about using fly ash concrete include:

- o Slower strength gain.
- o Seasonal limitation.
- o Increase in air-entraining admixtures.
- o An increase of salt scaling produced by higher fly ash.

QUESTION 58.

Consider the following statements about the World Nature Organization (WNO):

1. It has been initiated by the South Asian nations to mitigate climate change.
2. The role of the organization is to turn declarations into implementable actions and to support the protection of the environment and climate at an international level.
3. The membership is open for all governments and intergovernmental organizations.

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

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

Correct Answer: B



Your Answer: Unanswered
Explanation

Marks: 0/1.00

Solution (b)

Explanation:

World Nature Organization (WNO)

WNO initiative was born in 2010 by states which are threatened by rising sea levels. The WNO Treaty officially entered into force on 1st May 2014.

It is located at Geneva, Switzerland

Key Functions:

- It is an intergovernmental organisation which promotes global environmental protection.
- The initiative was started by countries surrounding the Pacific Ocean, the Caribbean, and by emerging African countries, which are the primary nations threatened by climate change through increasing droughts and rising sea levels. **(Hence statement 1 is incorrect)**
- The membership is open for all governments and intergovernmental organizations (IGO). India is not a member. **(Hence statement 3 is correct)**
- The role of the Organization is to turn declarations into implementable actions and to support the protection of the environment and climate at an international level. **(Hence statement 2 is correct)**
- WNO acts as a centre of competence for environmental protection, green technologies and sustainability, and as a mediator and initiator, making available experience of practical applications and strategies, offering support on all issues related to responsible conduct as regards the natural environment and its resources and assisting States to benefit from efficient development and from scientific and technology transfer.
- The World Nature Organization promotes sustainable conduct as regards the natural environment, together with new, environments-friendly technologies, green economies and renewable energies.

QUESTION 59.

Consider the following statements about Atmospheric Ozone:

1. It is always beneficial for human beings on earth.
2. Refrigeration process leads to destruction of ozone molecules.
3. Halogen compounds are responsible for ozone depletion.

How many of the given statements is/are correct?

- a) Only one

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Ozone

· The ozone layer is one of the layers in the earth's atmosphere, contained mostly within in the stratosphere's layer, at a distance of between 15 and 30 km from the surface of the earth. Ozone is both beneficial and harmful for human beings on earth. Harmful when present in troposphere as being a poisonous gas and beneficial when present in stratosphere by protecting from UV rays. (**Hence statement 1 is incorrect**)

· Ozone is a molecule, with a strong smell and it is blue in color. In 10 million air molecules, only 3 are ozone, making it much less common than other molecules such as oxygen, which make up about 2 million of every 10 million air molecules. Despite the relatively small percentage of ozone molecules in the earth's atmosphere, it is extremely important for life on earth. Ozone molecules absorb the UVB ultraviolet light that does so much damage on the planet. Ozone helps to protect people, animals, plants, and marine life from the sun's harmful rays. The ozone layer has been damaged by substances known as chlorofluorocarbons (CFCs) which were used in a variety of products such as insulating foam, solvents, and refrigerants.

· The Montreal Protocol, enacted in 1989, was put in place to try to protect the ozone layer by phasing out substances that deplete the ozone layer worldwide.

· Refrigeration by humans on earth is releasing Ozone Depleting Substances (ODS) like CFCs thus destroying ozone molecules. (**Hence statement 2 is correct**)

· ODS are generally halogen compounds like CFCs, HCFCs which contain elements like chlorine and fluorine and are responsible for ozone depletion. (**Hence statement 3 is correct**)

QUESTION 60.

Consider the following gases related to Fly Ash:

1. Carbon monoxide
2. Silicon dioxide
3. Aluminum oxide
4. Calcium oxide

How many of the given gases are present in fly ash that is produced in thermal power plants?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Fly Ash

· Fly ash is one of the residues generated by coal combustion, and is composed of the fine particles that are driven out of the boiler with the flue gases.

· Depending upon the source and makeup of the coal being burned, the components of fly ash vary considerably, but all fly ash includes substantial amounts of **silicon dioxide (SiO₂)** (both amorphous and crystalline), **aluminum oxide (Al₂O₃)** and **calcium oxide (CaO)**, the main mineral compounds in coalbearing rock strata. **(Hence 2, 3 and are correct)**

· **Fly Ash coming from thermal power plants does not contain carbon monoxide. (Hence 1 is incorrect)**

· Fly ash is a fine powder which is a byproduct of burning pulverized coal in electric generation power plants. Fly ash is a pozzolan, a substance containing aluminous and siliceous material that forms cement in the presence of water.

· When mixed with lime and water it forms a compound similar to Portland cement. Fly ash can be used as prime material in blocks, paving or bricks; however, one of the most important applications is PCC pavement. PCC pavements use a large amount of concrete and substituting fly ash provides significant economic benefits.

QUESTION 61.

Consider the following statements with reference to effects of Solid Waste:

1. Spread of Dioxin due to the burning of PVC.
2. Leaching of toxic dyes.
3. Disturbance in soil microbe activity

How many of the given statements is/are correct?

- a) Only one
- b) Only two

- c) All three
d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Effects of Solid Waste

- The land gets littered by plastic bag garbage and becomes ugly and unhygienic.
- Conventional plastics have been associated with reproductive problems in both humans and wildlife.
- Dioxin (highly carcinogenic and toxic) by-product of the manufacturing process is one of the chemicals believed to be passed on through breast milk to the nursing infant.
- Burning of plastics, especially PVC releases this dioxin and also furan into the atmosphere. Thus, conventional plastics, right from their manufacture to their disposal are a major problem to the environment. **(Hence statement 1 is correct)**
- Plastic bags can also contaminate foodstuffs due to leaching of toxic dyes and the transfer of pathogens. **(Hence statement 2 is correct)**
- Careless disposal of plastic bags chokes drains, blocks the porosity of the soil and causes problems for groundwater recharge.
- Plastic disturbs the soil microbe activity. The terrestrial and aquatic animals misunderstand plastic garbage as food items, swallow them and die. **(Hence statement 3 is correct)**
- Plastic bags deteriorate soil fertility as it forms part of manure and remains in the soil for years.
- These bags finding their way into the city drainage system results in blockage causing inconvenience, difficult in maintenance, create an unhygienic environment resulting in health hazards and spreading of water-borne diseases.
- Designing eco-friendly, biodegradable plastics are the need of the hour.

QUESTION 62.

Consider the following statements with reference to 'The United Nations Office for Disaster Risk Reduction':

1. Its functions span the social, economic, environmental as well as humanitarian fields.
2. It supports the implementation, follow up and review of the Sendai Framework for Disaster Risk Reduction.

3. It publishes the Global Assessment Report on Disaster Risk Reduction in collaboration with the World Bank.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

The United Nations Office for Disaster Risk Reduction (UNISDR)

- UNISDR was created in December 1999. The successor to the secretariat of the International Decade for Natural Disaster Reduction, it was established to ensure the implementation of the International Strategy for Disaster Reduction.
- UNISDR is part of the United Nations Secretariat and its functions span the social, economic, environmental as well as humanitarian fields. **(Hence statement 1 is correct)**
- UNISDR supports the implementation, follow-up and review of the Sendai Framework for Disaster Risk Reduction adopted by the Third UN World Conference on Disaster Risk Reduction on 18 March 2015 in Sendai, Japan. The Sendai Framework is a 15-year voluntary, nonbinding agreement that maps out a broad, people-centred approach to disaster risk reduction, succeeding the 2005-2015 Hyogo Framework for Action. **(Hence statement 2 is correct)**
- UNISDR's vision is anchored on the four priorities for action set out in the Sendai Framework: understanding disaster risk, strengthening disaster risk governance to manage disaster risk, investing in disaster risk reduction for resilience, and enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.
- Global Assessment Report is published biennially by UNISDR in collaboration with a wide range of stakeholders - UN agencies, government, academic and research institutions, donors and technical organizations and specialists. **(Hence statement 3 is incorrect)**
- UNISDR informs and connects people by providing practical services and tools such as the risk reduction website- Prevention Web, terminology, publications on good practices, country profiles and the Global Assessment Report on Disaster Risk Reduction which is an authoritative biennial analysis of global disaster risks and trends.

QUESTION 63.

Eutrophication can be most appropriately defined as?

- a) Enhanced plankton growth due to excess supply of nutrients.
- b) Amount of dissolved oxygen needed to break down organic material.
- c) An increase in the concentration of a nutrient as you move up the food chain.
- d) A decrease in biotic potential of the aquatic ecosystem.

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Eutrophication

Eutrophication or hypertrophication, is when a body of water becomes overly enriched with minerals and nutrients that induce excessive growth of plants and algae. This process may result in oxygen depletion of the water body. **(Hence option (a) is correct answer)**

The main effects caused by eutrophication can be summarized as:

- Abundance of particulate substances (phytoplankton, zooplankton, bacteria, fungi and debris) that determine the turbidity and colouration of the water;
- Abundance of inorganic chemicals such as ammonia, nitrites, hydrogen sulphide etc. that in the drinking water treatment plants induce the formation of harmful substances such as nitrosamines suspected of mutagenicity;
- Abundance of organic substances that give the water disagreeable odours or tastes, barely masked by chlorination in the case of drinking water. These substances, moreover, form complex chemical compounds that prevent normal purification processes and are deposited on the walls of the water purifier inlet tubes, accelerating corrosion and limiting the flow rate;
- The water acquires disagreeable odours or tastes (of earth, of rotten fish, of cloves, of watermelon, etc.) due to the presence of particular algae;
- Disappearance or significant reduction of quality fish with very negative effects on fishing (instead of quality species such as trout undesirable ones such as carp become established) and ocean acidification;
- Possible affirmation of toxic algae with potential damage to the population and animals drinking the affected water;
- Prohibition of touristic use of the lake and bathing, due to both the foul odour on the shores caused by the presence of certain algae, as well as the turbidity and anything but clean and attractive appearance of the water; bathing is dangerous because certain algae cause skin irritation;
- Reduction of oxygen concentration, especially in the deeper layers of the lake at the end of summer and in autumn.

QUESTION 64.

Consider the following statements with respect to the concept of 'Dead Zones' in the oceans:

1. It is caused due to excessive nutrient pollution from human activities that deplete the oxygen required to support the marine ecosystem.
2. These occur near inhabited coastlines, where aquatic life is most concentrated.
3. It also includes the vast middle portions of the oceans, which naturally have little life.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Dead Zones

· Dead zones are hypoxic (low-oxygen) areas in the world's oceans and large lakes, caused by "excessive nutrient pollution from human activities coupled with other factors that deplete the oxygen required to support most marine life in bottom and near bottom water. **(Hence statement 1 is correct)**

· In the 1970s oceanographers began noting increased instances of dead zones. There are many physical, chemical, and biological factors that combine to create dead zones, but nutrient pollution is the primary cause of those zones created by humans.

· Excess nutrients that run off land or are piped as wastewater into rivers and coasts can stimulate an overgrowth of algae, which then sinks and decomposes in the water. The decomposition process consumes oxygen and depletes the supply available to healthy marine life.

· Less oxygen dissolved in the water is often referred to as a "dead zone" because most marine life either dies, or, if they are mobile such as fish, leave the area. Habitats that would normally be teeming with life become, essentially, biological deserts.

· The vast middle portions of the oceans, which naturally have little life, are not considered "dead zones". **(Hence statement 3 is incorrect)**

· These occur near inhabited coastlines, where aquatic life is most concentrated due requirement. **(Hence statement 2 is correct)**

· Dead zones occur in many areas of the country, particularly along the East Coast, the Gulf of Mexico, and the Great Lakes, but there is no part of the country or the world that is immune. The second largest dead zone in the world is located in the U.S., in the northern Gulf of Mexico.

QUESTION 65.

Consider the following Practices with reference to 'Destructive Fishing':

1. Bottom trawls
2. Cyanide fishing
3. Dynamite fishing
4. Bycatch
5. Ghost fishing

How many of the above are the examples of Destructive Fishing Practices?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Destructive Fishing Practices

· **Bottom Trawling:** It is an industrial method which uses enormous nets weighed down with heavy ballast which are dragged along the sea floor, raking up or crushing everything in their way, from fish to ancient coral.

· **Cyanide fishing:** In this technique, fishers squirt sodium cyanide into the water to stun fish without killing them, making them easy to catch.

· **Dynamite fishing:** In this technique, dynamite or other explosives are set off under water. The dead fish floating to the surface are then simply scooped up. The explosives completely destroy the underwater environment, leaving it as rubble. Dynamite fishing has contributed to massive destruction of coral reefs.

· **Bycatch:** It refers to all the forms of marine life caught unintentionally while catching other fish. This destroys the young members of the school also.

· **Ghost fishing:** It occurs when fishing gear is lost or abandoned at sea. The gear can continue to catch fish, dolphins, whales, turtles, and other creatures as it drifts through the water and after it becomes snagged on the seabed.

(Hence all the statements are correct)

QUESTION 66.

Consider the following statements regarding the 'International Whaling Commission' (IWC):

1. India is a member state.
2. International Convention for the Regulation of Whaling is the legal framework which established the IWC in 1946.
3. Indian Ocean Whale Sanctuary and the Southern Ocean Whale Sanctuary are the only two sanctuaries designated by IWC.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

The International Whaling Commission (IWC)

· The International Whaling Commission (IWC) is the global body charged with the conservation of whales and the management of whaling. It was set up to provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry. Uncertainty over whale numbers led to the introduction of a 'moratorium' on commercial whaling in 1986. This remains in place although the Commission continues to set catch limits for aboriginal subsistence whaling.

· The main duty of the IWC is to keep under review and revise as necessary the measures laid down in the Schedule to the Convention which govern the conduct of whaling throughout the world. These measures, among other things, provide for the complete protection of certain species; designate specified areas as whale sanctuaries; set limits on the numbers and size of whales which may be taken; prescribe open and closed seasons and areas for whaling; and prohibit the capture of suckling calves and female whales accompanied by calves.

· The IWC currently has 89 member governments from countries all over the world. India is a member state. All members are signatories to the International Convention for the Regulation of Whaling. **(Hence statement 1 is correct)**

· International Convention for the Regulation of Whaling is an international environmental agreement which governs the commercial, scientific, and aboriginal subsistence whaling practices. This Convention is the legal framework which established the IWC in 1946. **(Hence statement 2 is correct)**

· Today, the Commission also works to understand and address a wide range of non-whaling threats to cetaceans including entanglement, ship strike, marine debris, climate change and other environmental concerns.

· In 1994, it created the Southern Ocean Whale Sanctuary surrounding the continent of Antarctica. Here, the IWC has banned all types of commercial whaling.

· Only two such sanctuaries have been designated by IWC till date. Another is Indian Ocean Whale Sanctuary by the tiny island nation of the Seychelles. **(Hence statement 3 is correct)**

QUESTION 67.

Consider the following statements with respect to Noise pollution:

1. Sound is measured in decibels (dB).
2. World Health Organization recommends that the sound level indoors should be less than 40 dB.
3. It impacts breathing amplitude, blood pressure, heart-beat rate, pulse rate, and blood cholesterol.

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Noise pollution

· Noise pollution is an unpleasant noise created by people or machines that can be annoying, distracting, intrusive, and/or physically painful.

· Noise pollution comes from sources such as “road traffic, jet planes, garbage trucks, construction equipment, manufacturing processes, leaf blowers, and boom boxes.”

· Sound is measured in decibels (dB). An increase of about 10 dB is approximately double the increase in loudness. **(Hence statement 1 is correct)**

· A person’s hearing can be damaged if exposed to noise levels over 75 dB over a prolonged period of time. The World Health Organization recommends that the sound level indoors should be less than 30 dB. **(Hence statement 2 is incorrect)**

Impacts of noise

· **Annoyance:** It creates annoyance to the receptors due to sound level fluctuations. The a-periodic sound due to its irregular occurrences causes displeasure to hearing and causes annoyance.

· **Physiological effects:** The physiological features like breathing amplitude, blood pressure, heart-beat rate, pulse rate, blood cholesterol are affected. **(Hence statement 3 is correct)**

· **Loss of hearing:** Long exposure to high sound levels cause loss of hearing. This is mostly unnoticed but has an adverse impact on hearing function.

· **Human performance:** The working performance of workers/humans will be affected as it distracts the concentration.

QUESTION 68.

Consider the following statements about Rotterdam Convention:

1. The convention promotes open exchange of information between importers-exporters of hazardous chemicals.
2. Signatory nations can decide whether to allow or ban the importation of chemicals listed in the treaty.
3. It is jointly administered by the World Health Organisation and the United Nations Environment Programme (UNEP).

How many of the given statements is/are correct?

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)**Explanation:****Rotterdam Convention:**

Rotterdam Convention is also called as the ***Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade***.

Role:

- The convention promotes open exchange of information between importers-exporters of hazardous chemicals. **(Hence statement 1 is correct)**
- Calls on exporters of hazardous chemicals to use proper labeling, include directions on safe handling, and inform purchasers of any known restrictions or bans.
- Signatory nations can decide whether to allow or ban the importation of chemicals listed in the treaty. **(Hence statement 2 is correct)**
- Exporting countries are obliged to make sure that producers within their jurisdiction comply.
- It is jointly administered by the United Nations Food and Agriculture Organization (FAO) and the United Nations Environment Programme (UNEP). **(Hence statement 3 is incorrect)**

QUESTION 69.

Consider the following statements regarding impacts of plastic on marine ecosystem?

1. It impacts the health of the marine food web and the fisheries resources.
2. It interferes with the plankton species i.e., phytoplankton and zooplankton.
3. Plastics exposed to sea water tend to concentrate toxic and non-toxic organic compounds present in the sea water at low concentrations.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation**Solution (c)****Explanation:**

Impact of Plastic on Marine Ecosystem

- Plastics contaminate the marine environment; the increased use of plastics has led to negative environmental impacts.
- Plastics pollution can interfere with the plankton species (phytoplankton - primary producer zooplankton primary consumers) and that form the foundation of the food web, and other organisms adversely affecting the delicate balance in the marine ecosystem. **(Hence statement 1 and 2 are correct)**

Plastics as a Waste Material- in Marine Environment

- Plastic waste is well known to result primarily from fishing-related activities, and from non-point source influx from beaches.
- There are two clear differences between the fate of plastics debris in the ocean environment as opposed to on land environments.
 - o The rate of UV-induced photo-oxidative degradation of plastics floating or submerged at sea is very much slower than that exposed to the same solar radiation on land.
 - o Unlike on land there is no easy means of retrieval, sorting and recycling of plastic waste that enters into the ocean environment.
- These two factors generally result in extended lifetimes for plastics at sea.

Impact of Micro-particles

- Challenging the Antarctic krill and other zooplankton with plastic beads that are about 20 microns or so in size has demonstrated that these micro-particulates are readily ingested by these organisms. They appear to ingest the particles unselectively, and the ingestion rates depend on the concentration of particles in the environment.
- Plastics are bio-inert and are not expected to be toxic to the animal in the conventional sense. While physical obstruction or indirect interference with physiology is always possible (as with sea birds showing satiation on ingesting plastics) the material will pass through the animal virtually unchanged.
- Plastics exposed to sea water tend to concentrate toxic and non-toxic organic compounds present in the sea water at low concentrations. These, including PCBs, DDT, and nonylphenols, have very high partition coefficients and are very efficiently concentrated in the plastic material. **(Hence statement 3 is correct)**
- Plastic-related distress to over 250 species has been documented worldwide. The focus has very much been on larger species in surface waters or beaches, despite the fact that 99 percent of marine species live in the benthos. The impact of negatively buoyant plastic waste (such as nylon net fragments) on benthic species has remained virtually unaddressed.

QUESTION 70.

Agriculture is not only sensitive to climate change but also one of the drivers for climate change. Consider the following statements in this regard:

1. Livestock and dairy products
2. Promotion of vegetarianism
3. Land-use changes
4. Intensive farming methods

How many of the above can be the causes of climate change?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Impact of Agriculture on Climate

· Agriculture is not only sensitive to climate change but also one of the major drivers for climate change.

· Farming, in particular, releases significant amounts of methane and nitrous oxide, two powerful greenhouse gases. Methane is produced by livestock during digestion due to enteric fermentation and is released via belches. It can also escape from stored manure and organic waste in landfills. Nitrous oxide emissions are an indirect product of organic and mineral nitrogen fertilizers.

· Meat and dairy products have the highest global footprint of carbon. Moderate ruminant meat consumption contributes roughly half of agriculture's production related emissions. **(Hence statement 1 is correct)**

· Promotion of vegetarianism will help reduce agriculture related emissions. Shifting to a plant-based diet has the potential to lower greenhouse gas emissions, reduce environmental degradation, and promote a healthy diet. **(Hence statement 2 is incorrect)**

· In terms of greenhouse-gas emissions, livestock and fodder production, each generates more than 3 billion tons of CO₂ equivalents.

· In line with projected population growth and changes in dietary habits in favor of higher meat consumption, the global demand for food is expected to grow by up to 70% in the coming decades. Agriculture is already one of the economic sectors with the largest environmental impact. This substantial increase in demand will unsurprisingly create additional pressures.

· Land-use changes can also significantly contribute to climate change. **(Hence statement 3 is correct)**

· Large scale changes such as deforestation, soil erosion or machine intensive farming methods may all contribute to increased carbon concentrations in the atmosphere. **(Hence statement 4 is correct)**

QUESTION 71.

Consider the following statements with respect to Thermal Pollution:

1. Thermal pollution can be controlled by passing the heated water through a cooling pond or a cooling tower after it leaves the condenser.
2. Thermal pollution is caused due to the use of water as a coolant by power plants and industrial manufacturers.
3. Thermal pollution may increase the metabolic rate of aquatic animals.
4. The warm temperature increases the levels of Dissolved Oxygen (DO) in water thus harms aquatic ecosystem.

How many of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Thermal Pollution

· Thermal pollution is defined as the addition of excess of undesirable heat to water thereby making it harmful to man, animal or aquatic life. Thermal pollution may also cause significant departures from normal activities of aquatic communities. Sources of Thermal Pollution: Nuclear power plants, Coal fired plants, Industrial effluents, Domestic sewage, and Hydro-electric power.

· Thermal pollution can be controlled by passing the heated water through a cooling pond or a cooling tower after it leaves the condenser. **(Hence statement 1 is correct)**

· A common cause of thermal pollution is the use of water as a coolant by power plants and industrial manufacturers. When water used as a coolant is returned to the natural environment at

a higher temperature, the sudden change in temperature decreases oxygen supply and affects ecosystem composition. **(Hence statement 2 is correct)**

· Thermal pollution may also increase the metabolic rate of aquatic animals, as enzyme activity, resulting in these organisms consuming more food in a shorter time than if their environment were not changed. **(Hence statement 3 is correct)**

· The warm temperature decreases the levels of DO (Dissolved Oxygen) in water and thus harms the aquatic ecosystem. The warm water holds relatively less oxygen than cold water. The decrease in DO can create suffocation for plants and animals such as fish, amphibians and copepods, which may give rise to anaerobic conditions. **(Hence statement 4 is incorrect)**

QUESTION 72.

Regarding the recent news about the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and Long-Term Aspirational Goals (LTAG), consider the following statements:

1. The Ministry of Civil Aviation has announced that India will join the Carbon Offsetting and Reduction Scheme for International Aviation and Long-Term Aspirational of the International Civil Aviation Organisation from 2027.
2. ICAO aims for 2% annual fuel efficiency improvement until 2050, carbon neutral growth, and net-zero emissions by 2050 to tackle aviation's carbon emissions.
3. CORSIA applies only to international flights, those originating from one country and flying to another.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and Long-Term Aspirational Goals (LTAG)

· **The Ministry of Civil Aviation (MoCA)** has announced that India will join the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and Long-Term Aspirational Goals (LTAG) of the International **Civil Aviation Organisation (ICAO) from 2027** . **(Hence statement 1 is correct)**

- ICAO aims to address carbon emissions from aviation by adopting goals **such as 2% annual fuel efficiency improvement until 2050** , achieving carbon neutral growth, and reaching net-zero emissions by 2050. **(Hence statement 2 is correct)**
- CORSIA provides a harmonized approach to reduce emissions from international aviation, ensuring fairness and considering the unique circumstances and capabilities of ICAO Member States.
- CORSIA is implemented in three phases: a pilot phase (2021-2023), a first phase (2024-2026), and a second phase (2027-2035). Participation in the first two phases is voluntary.
- **CORSIA applies only to international flights** , those originating from one country and flying to another. **(Hence statement 3 is correct)**
- It is estimated that CORSIA will mitigate around 2.5 billion tonnes of CO₂ between 2021 and 2035, with an average annual reduction of 164 million tonnes of CO₂.
- The 41st ICAO Assembly endorsed the Long-Term Aspirational Goals (LTAG) for international aviation, aiming for net-zero carbon emissions by 2050 in support of the UNFCCC Paris Agreement.
- The LTAG does not impose specific emission reduction goals on individual states but allows each state to contribute within its own national timeframe and circumstances.
- ICAO, headquartered in Montreal, Canada, was established in 1947 under the Convention on International Civil Aviation (Chicago Convention) drafted in 1944 by 54 nations.
- ICAO is a specialized agency of the United Nations and has 193 member states, including India. Its vision is to achieve sustainable growth in the global civil aviation system.

QUESTION 73.

With reference to the Impact of Climate Change on inflation, consider the following statements:

1. Climate change is projected to increase global inflation by up to one percentage point annually due to higher food costs.
2. Climate change induced natural disasters have differential and opposing effects on inflation and growth through various channels.
3. These effects include stimulating economic activity and enhancing labor productivity, increasing wealth and income, and positively influencing consumption and investment.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

**Correct Answer:** B**Your Answer:** Unanswered**Marks:** 0/1.00**Explanation****Solution (b)****Explanation:****Impact of climate change on inflation:****European Central Bank Report:**

- Climate change is projected to increase global inflation by up to one percentage point annually due to higher food costs. **(Hence statement 1 is correct)**
- The report forecasts a potential rise in annual inflation ranging from 0.32 to 1.18 percentage points higher by 2035.
- This poses challenges for consumers and policymakers striving to maintain low inflation levels.

IMF Report:

- The IMF's report titled 'Eye of the storm: The impact of Climate shocks on inflation and growth' presents a similar analysis.
- Climate-induced natural disasters have differential and opposing effects on inflation and growth through various channels. **(Hence statement 2 is correct)**
- These effects include dampening economic activity and lowering labor productivity, reducing wealth and income, and impacting consumption and investment. **(Hence statement 3 is incorrect)**
- Climate shocks also affect transportation infrastructure and distribution costs.

Variation in Inflation Impact:

- The impact of weather-related shocks on core and food inflation shows significant variation in magnitude and pattern across country groups.
- Different countries will experience diverse effects on inflation and growth due to climate shocks.

Heterogeneity in Inflation and Income Growth:

- The differing patterns of inflation and growth responses to climate shocks will result in greater heterogeneity in the level of inflation and income growth experienced by different segments of society within a country.

QUESTION 74.

Recently, River-Cities Alliance (RCA), organized by National Mission for Clean Ganga (NMCG), is a collaborative platform for sustainable management of urban rivers with 109 river cities across India and one international member city from Denmark. *RCA is a joint initiative of?*

- a) Ministry of Transport and Ministry of Housing and Urban Affairs
- b) Ministry of Agriculture and Ministry of Housing and Urban Affairs
- c) Ministry of Agriculture and Ministry of Transport
- d) Ministry of Jal Shakti and Ministry of Housing and Urban Affairs

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

River-Cities Alliance (RCA)

- RCA Global Seminar organized by the National Mission for Clean Ganga (NMCG).
- RCA serves as a dedicated platform for river cities to collaborate, share ideas, and exchange information for the sustainable management of urban rivers.
 - o It has expanded to include 109 river cities across India, along with one international member city from Denmark.
 - o The alliance is open to all river cities in India.
- RCA is a joint initiative of the **Ministry of Jal Shakti and the Ministry of Housing and Urban Affairs. (Hence option d) is correct)**

QUESTION 75.

With reference to the 'Debt for Climate Swaps', consider the following statements:

1. Debt for Climate (DFC) swaps are a form of debt swap where debtor nations make payments in local currency instead of foreign currency to finance climate projects domestically.
2. DFC swaps had their inception within the framework of the Paris Agreement.
3. DFC swaps enable enhanced climate spending and reduced external sovereign debt.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

**Correct Answer:** B**Your Answer:** Unanswered**Marks:** 0/1.00**Explanation****Solution (b)****Explanation:****Debt for Climate (DFC) swaps:****Definition and Purpose:**

- DFC swaps are a form of debt swap where debtor nations make payments in local currency instead of foreign currency to finance climate projects domestically . **(Hence statement 1 is correct)**
- The objective is to address climate change while avoiding additional debt burdens for countries facing existing debt challenges.

Historical Background:

- DFC swaps were **first introduced in the 1980s in Latin America. (Hence statement 2 is incorrect)**
- Over time, they have gained popularity as a debt-relief measure, particularly among low and middle-income countries.

Outcomes of DFC Swaps:

- **Enhanced climate spending .**
- Boosting economic recovery: Investments in climate projects can stimulate private investment and support economic recovery, while also promoting climate resilience and protecting biodiversity.
- **Reduced external sovereign debt. (Hence statement 3 is correct)**
- Fulfillment of global commitments: DFC swaps enable signatories of the Paris Agreement and the Glasgow Financial Alliance for Net Zero (GFANZ) to fulfill their commitment to providing financial assistance to developing countries in their efforts towards a clean and climate-resilient future.

QUESTION 76.

Recently the Reserve Bank of India (RBI) has joined hands with the Global Financial Innovation Network (GFIN) involving 13 international regulators, firms, and innovators. What is the purpose of RBI's collaboration with GFIN in the Green washing TechSprint?

- To tackle exaggerated or misleading claims about Environmental, Social, and Governance (ESG) credentials.
- To promote sustainable finance.



- c) To develop innovative tools for Environmental, Social, and Governance (ESG) investing.
- d) To provide training on the Digital Sandbox.

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

RBI collaboration with Global Financial Innovation Network (GFIN) to prevent 'greenwashing':

RBI's participation in the TechSprint:

- The Reserve Bank of India (RBI) has joined hands with the Global Financial Innovation Network (GFIN).
- RBI is participating in the GreenwashingTechSprint, along with 13 international regulators, firms, and innovators.
- **The TechSprint aims to tackle exaggerated or misleading claims about Environmental, Social, and Governance (ESG) credentials . (Hence option a) is correct)**

Objective of the TechSprint:

- The objective is to develop a tool that helps regulators and the market effectively address the risks of greenwashing in financial services.
- Firms will collaborate with regulatory experts and stakeholders to develop the tool.
- The TechSprint will take place from June to September 2023.

Support for participating firms:

- GFIN provides an information pack to support the application process for interested firms.
- Successful firms proceed to on-boarding, which includes training on the Digital Sandbox and an overview of the TechSprint process.

Addressing concerns of greenwashing:

- Greenwashing involves making exaggerated or unsubstantiated claims about environmental benefits.
- The TechSprint aims to tackle greenwashing risks, which can mislead investors and consumers and undermine sustainable finance.
- The development of a tool to address greenwashing in financial services promotes transparency and credibility in ESG investing.

QUESTION 77.

With reference to the Carbon Credits Trading Scheme (CCTS), consider the following statements:

1. The Ministry of Power, in consultation with the Bureau of Energy Efficiency (BEE), has issued a draft scheme called the Carbon Credits Trading Scheme (CCTS).
2. The objective of CCTS is to minimize or eliminate greenhouse gas emissions.
3. It includes provisions for the accreditation of Carbon Verifiers, who are agencies accredited by BEE to carry out validation or verification activities related to the CCTS.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Carbon Credits Trading Scheme (CCTS)

- The Ministry of Power, in consultation with the **Bureau of Energy Efficiency (BEE)**, has issued a draft scheme called the Carbon Credits Trading Scheme (CCTS). **(Hence statement 1 is correct)**
- The draft scheme was introduced following the enactment of **the Energy Conservation (Amendment) Act, 2022**, which gives the central government the authority to specify CCTS in collaboration with BEE.
- The CCTS aims to reduce or eliminate greenhouse gas (GHG) emissions. **(Hence statement 2 is correct)**
- The draft scheme outlines the structure of the proposed Indian Carbon Market, covering both voluntary trading and compliance.
- It includes provisions for the accreditation of Carbon Verifiers, who are agencies accredited by **BEE** to carry out validation or verification activities related to the CCTS. **(Hence statement 3 is correct)**

QUESTION 78.

With reference to the Global Greenhouse Gas Monitoring Infrastructure (GGMI), consider the following statements:

1. The Global Greenhouse Gas Monitoring Infrastructure (GGMI) was recently launched by the World Meteorological Organization (WMO).
2. The introduction of GGMI addresses a critical void in combating climate change through the implementation of standardized, real-time monitoring of greenhouse gas emissions.

Which of the given statements is/are correct?

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

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Global Greenhouse Gas Monitoring Infrastructure (GGMI):

- The **World Meteorological Organization (WMO)** recently launched the Global Greenhouse Gas Monitoring Infrastructure (GGMI). **(Hence statement 1 is correct)**
- GGMI aims to improve measurement methods for tracking planet-warming pollution and informing policy decisions.
- The platform integrates space-based and surface-based observing systems to address uncertainties related to greenhouse gas emissions.
- The **establishment of GGMI fills a crucial gap in the fight against climate change by providing standardized, real-time tracking of greenhouse gases**. **(Hence statement 2 is correct)**
- The initiative leverages WMO's experience in coordinating global collaboration, similar to its successful efforts in weather prediction and climate monitoring.
- GGMI builds upon WMO's existing activities in greenhouse gas monitoring, such as the Global Atmosphere Watch (GAW) and the Integrated Global Greenhouse Gas Information System (IG3IS).
- GAW focuses on understanding atmospheric composition and its changes, while IG3IS provides observation-based information on greenhouse gas trends and their alignment with emission reduction efforts.

QUESTION 79.

What is the significance of the recent study conducted by researchers in Goa regarding the Indian Ocean's deep-water circulations?

- a) It investigates the impact of tectonic changes on oceanic gateways.
- b) It explores the role of deep-water circulation in coral reef formation.
- c) It analyzes the influence of monsoon patterns on ocean currents.
- d) It examines the connection between El Niño events and oceanic heat transport.

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Global Overturning Circulation:

- Investigating the Past Deep-Water Circulations of the Indian Ocean
- Researchers from the National Centre for Polar and Ocean Research in Goa and the School of Earth, Ocean, and Atmospheric Sciences at Goa University have conducted a study to reconstruct the historical deep-water circulations in the Indian Ocean.
- Global overturning circulation, responsible for the equatorward movement of cold, deep waters and the poleward movement of warm, near-surface waters, plays a crucial role in the distribution of ocean heat and the regulation of atmospheric carbon dioxide levels, thus influencing global climate.

Research Highlights:

- **Investigation of tectonic changes: The study focuses on understanding the impact of tectonic changes on oceanic gateways**, specifically the closure of the Central American Seaway, and how these changes have influenced the circulation patterns in the Indian Ocean . **(Hence option a) is suitable answer)**
- Historical and present-day insights: By examining the effects of tectonic changes since the late Miocene period, the study provides valuable insights into the historical and present-day circulation patterns in the Indian Ocean.
- Role of geological events: The study contributes to our understanding of how geological events, such as the closure of oceanic gateways, can shape deep-water circulation and influence oceanic dynamics.
- Enhanced knowledge of oceanic dynamics: By investigating the impact of tectonic changes on deep-water circulations, the study expands our knowledge of the complex interactions between geological processes and oceanic currents.
- Implications for climate and environmental studies: Understanding the factors influencing deep-water circulation in the Indian Ocean has implications for climate research, as global overturning circulation plays a critical role in ocean heat distribution and atmospheric carbon dioxide levels.

QUESTION 80.

With reference to the PM-PRANAM (PM Programme for Restoration, Awareness, Generation, Nourishment, and Amelioration of Mother Earth) Scheme, consider the following statements:

1. The objective of the scheme is to decrease the promotion of chemical fertilizers, thereby reducing the government's subsidy burden on fertilizers.
2. The government encourages the adoption of alternative fertilizers by providing incentives to states that reduce the use of chemical fertilizers.
3. 50% of the subsidy savings from reduced chemical fertilizer consumption will be allocated to the states for promoting alternative fertilizers and other development initiatives.
4. Scheme also focuses on saving the soil and promoting sustainable, balanced use of fertilizers.

How many of the given statements is/are correct?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

PM-PRANAM Scheme:

- The PM-PRANAM (PM Programme for Restoration, Awareness, Generation, Nourishment, and Amelioration of Mother Earth) **scheme focuses on saving the soil and promoting sustainable, balanced use of fertilizers. (Hence statement 4 is correct)**
- State governments actively participate in the implementation of the scheme.
- The scheme aims to reduce the promotion of **chemical fertilizers, which will help alleviate the government's subsidy burden on fertilizers . (Hence statement 1 is correct)**
- The government encourages the adoption of **alternative fertilizers by providing incentives to states that reduce the use of chemical fertilizers . (Hence statement 2 is correct)**
- The subsidy savings from reduced chemical fertilizer consumption will be shared with the states, **with 50% of the savings being allocated for promoting alternative fertilizers** and other development works. **(Hence statement 3 is correct)**

Urea Gold Scheme:

- The Urea Gold scheme introduces Sulphur coated Urea (Urea Gold) in India for the first time.
- Urea Gold is more cost-effective and efficient compared to Neem coated urea.
- The scheme addresses Sulphur deficiency in the soil and helps farmers save input costs while enhancing production and productivity.

Market Development Assistance (MDA) for promoting Organic Fertilizers from Gobardhan Plants:

- The MDA scheme provides financial support of Rs 1500 per MT to promote the marketing of organic fertilizers produced from Biogas Plants/Compressed Biogas (CBG) Plants under the GOBARdhan initiative.
- The organic fertilizers, such as Fermented Organic Manures (FOM), Liquid FOM, and Phosphate Rich Organic Manures (PROM), will be branded as Bharat Brand FOM, LFOM, and PROM.
- This initiative helps manage crop residue, reduce stubble burning, and maintain a clean and safe environment, while providing an additional source of income for farmers.
- The scheme supports the establishment of waste-to-wealth plants under the GOBARdhan scheme and contributes to a circular economy by increasing the viability of Biogas/Compressed Biogas plants.

GOBARdhan Scheme:

- The GOBARdhan scheme supports villages in managing cattle waste, agriculture waste, and organic waste in rural areas.
- It facilitates the safe disposal of cattle and organic waste, improves environmental sanitation, and helps prevent vector-borne diseases.
- The government provides technical assistance and financial support of up to ₹50 lakhs per district to promote the safe disposal of waste under the scheme.

QUESTION 81.

Recently the 'Petersburg Climate Dialogue' was held which is an annual high-level international forum for climate talks. Co-hosted by Germany and the United Arab Emirates, the conference involved delegates from 30+ countries and organizations, highlighting diverse perspectives on climate issues alongside the upcoming COP28 hosted by the UAE.

What was the main focus of the Petersburg Climate Dialogue 2023?

- a) Discussing the importance of a clean energy transition.
- b) Assessing progress towards the objectives of the Paris Agreement.
- c) Mobilizing funding for climate action.
- d) Initiating discussions around a global target for renewable.

Correct Answer: A



Your Answer: Unanswered
Explanation

Marks: 0/1.00

Solution (a)

Explanation:

Petersberg Climate Dialogue 2023:

- The Petersberg Climate Dialogue is an annual forum for high-level international climate talks.
- The conference took place in Berlin, Germany from May 2-3, 2023.
- This year's conference was hosted by Germany and the United Arab Emirates.
- The United Arab Emirates is also hosting the 28th Conference of Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC).
- Delegates from more than 30 countries and international organizations attended the conference.
- Prominent attendees included the United Nations Secretary-General, the President of COP28, and the German Foreign Minister.
- **The conference highlighted the importance of a clean energy transition to limit global warming to 1.5°C. (Hence option a) is most suitable answer)**
- Discussions were initiated around a potential global target for renewables and the need to phase out fossil fuel emissions.
- The status of climate finance and the urgent need for financial support for climate action were discussed.
- Participants emphasized the need for a global financial systems transformation and a just transition to a low-carbon economy.
- The year 2023 marks the Global Stocktake, which will assess progress towards the objectives of the Paris Agreement.

QUESTION 82.

With reference to the Methane Alert and Response System (MARS), consider the following statements:

1. The Methane Alert and Response System (MARS) was launched at COP25 Madrid, Spain.
2. It is part of the International Methane Emissions Observatory (IMEO) strategy by the United Nations Environment Programme (UNEP).
3. MARS partners can provide technical or advisory services to assess mitigation opportunities in specific regions.

How many of the given statements is/are correct?



- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Methane Alert and Response System (MARS)

- The Methane Alert and Response System (MARS) **was launched at COP27 in Sharm El-Sheikh**, Egypt. **(Hence statement 1 is incorrect)**
- MARS is a satellite-based system designed to detect methane emissions and facilitate action to address them.
- It is part of the **International Methane Emissions Observatory (IMEO)** strategy by the United Nations Environment Programme. **(Hence statement 2 is correct)**
- MARS aims to provide policy-relevant data for mitigating methane emissions and curbing greenhouse gases.
- The system connects methane detection with transparent notification processes.
- It utilizes advanced satellite data to identify significant greenhouse emission events and notify relevant stakeholders.
- The data from MARS will also be used to support and track the progress of mitigation efforts.
- Upon request, **MARS partners can provide technical or advisory services to assess mitigation opportunities in specific regions.** **(Hence statement 3 is correct)**

QUESTION 83.

With reference to the Heat Dome, consider the following statements:

1. It refers to a high-pressure system that forms when a large area of high pressure in the upper atmosphere traps hot air near the Earth's surface.
2. Changes in weather patterns, such as slowed atmospheric circulation, can result in extended periods of stagnant weather, facilitating the formation of heat domes.
3. The prolonged hot and dry conditions associated with heat domes can lead to droughts and exacerbate wildfires.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Heat Dome:

· A heat dome refers to a high-pressure system that forms when a **large area of high pressure in the upper atmosphere traps hot air near the Earth's surface** . (Hence statement 1 is correct)

· This results in the creation of a dome-like structure of high pressure, preventing the hot air from rising and cooling, leading to prolonged periods of hot and dry weather conditions.

Impacts of Heat Domes on Human Health:

- Heat domes can have severe consequences for human health.
- Extended exposure to extreme heat associated with heat domes can give rise to heat-related illnesses like heat exhaustion and heat stroke, which can be life-threatening.
- Heat domes also worsen pre-existing health conditions, including asthma and heart disease, and raise the risk of dehydration and heat-related injuries.
- Vulnerable groups, such as the elderly, children, individuals with pre-existing health conditions, construction workers, farmers, and those living in poverty, are particularly susceptible to these health impacts.

Factors Contributing to Increased Frequency and Intensity of Heat Domes:

- Several factors contribute to the heightened frequency and intensity of heat domes.
- **Climate change plays a significant role** as rising global temperatures disrupt weather patterns and create conditions favorable for heat dome formation. (Hence statement 2 is correct)
- The melting of icebergs and reduction in Arctic Sea ice contribute to drier conditions, diminishing the ocean's ability to moderate temperature extremes.
- Changes in weather patterns, such as slowed atmospheric circulation, can result in extended periods of stagnant weather, facilitating the formation of heat domes.

Environmental Impacts of Heat Domes:

- Heat domes have far-reaching consequences for the environment.

· The prolonged hot and dry conditions associated with heat domes can **lead to droughts , exacerbate wildfires** , and cause damage to infrastructure like roads and buildings. **(Hence statement 3 is correct)**

· Drier conditions have long-term impacts on ecosystems, including shifts in plant and animal populations, and disruptions to agricultural production.

QUESTION 84.

Consider the following statements with respect to the 'Global Greenhouse Gas Monitoring Infrastructure':

1. It was introduced by the United Nations Environment Programme (UNEP) aims to enhance monitoring and establish a standardized real-time tracking system for greenhouse gas levels.
2. The new platform combines space-based and surface-based observing systems to enhance the measurement of pollution that contributes to global warming and provide more accurate and timely data.

Which of the given statements is/are *incorrect* ?

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

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Global Greenhouse Gas Monitoring Infrastructure

· The **World Meteorological Organization (WMO)** has introduced the Global Greenhouse Gas Monitoring Infrastructure to enhance the monitoring of greenhouse gases and provide standardized, real-time tracking of their levels . **(Hence statement 1 is incorrect)**

· **This new platform integrates space-based and surface-based observing systems to improve the measurement of planet-warming pollution and offer more precise and timely data . (Hence statement 2 is correct)**

· The purpose of the Global Greenhouse Gas Monitoring Infrastructure is to address uncertainties regarding the destination of greenhouse gas emissions and provide essential information to support the implementation of the Paris Agreement on climate change.

- The infrastructure is crucial in light of the significant contribution of carbon dioxide, nitrous oxide, and methane to global warming, accounting for 66% of the problem.
- As emissions continue to rise and existing targets prove insufficient, governments need to adopt new plans and policies to address climate change more effectively.
- The Global Greenhouse Gas Monitoring Infrastructure will aid governments in achieving these goals by providing accurate data and facilitating informed decision-making.
- Additionally, the infrastructure aims to strengthen the scientific mitigation actions undertaken by the United Nations Framework Convention on Climate Change (UNFCCC) and encourage collaboration with countries worldwide in weather prediction and emission reduction efforts.
- The focus of the Global Greenhouse Gas Monitoring Infrastructure aligns with the long-standing objectives of the Integrated Greenhouse Gas Information System (IG3IS), which was launched under the Global Atmosphere Watch Programme.
- The IG3IS aims to provide detailed information about the distribution of greenhouse gases in the atmosphere and operates under the auspices of the WMO.

QUESTION 85.

Recently the Indian Government issued the E-Waste (Management) Rules, 2022, which came into effect from 1st April, 2023, with reference to this consider the following statements:

1. The rules exclude waste batteries, packaging plastics, micro enterprises, and radioactive wastes.
2. The rules impose restrictions on the use of hazardous substances like lead, mercury, and cadmium in the manufacturing of electronic equipment.
3. The Central Pollution Control Board (CPCB) will conduct random sampling to monitor compliance with reduced use of hazardous substances.
4. Manufacturers are responsible for collecting and properly recycling or disposing of e-waste generated during the manufacturing process.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) Three only
- d) All four

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:**E-Waste (Management) Rules, 2022**

- The Indian Government issued the E-Waste (Management) Rules, 2022, which will be effective from April 1, 2023.
- The rules apply to businesses and individuals involved in various aspects of e-waste management, including manufacturing, sales, transfer, refurbishing, recycling, and more.
- The number of items categorized as e-waste has increased from 21 to 106, covering a wide range of electrical and electronic equipment.
- The **rules exclude waste batteries** (covered under Battery Waste Management Rules, 2022), packaging plastics (covered under Plastic Waste Management Rules, 2016), micro enterprises, and radioactive wastes (covered under respective acts). **(Hence statement 1 is correct)**
- The rules **mandate the reduction of hazardous substances**, such as lead, mercury, and cadmium, in the manufacturing of electronic equipment to protect human health and the environment. **(Hence statement 2 is correct)**
- The **Central Pollution Control Board (CPCB)** will conduct random sampling to monitor compliance with reduced use of hazardous substances. **(Hence statement 3 is correct)**
- Manufacturers are required to use recyclable technologies, ensure compatibility of components, and minimize e-waste generation.
- Import or sales of new electrical and electronic equipment must comply with government regulations, and non-compliant products must be withdrawn from the market.
- Manufacturers are responsible for **collecting and properly recycling or disposing of e-waste** generated during the manufacturing process. **(Hence statement 4 is correct)**

QUESTION 86.

Recently at the Davos World Economic Forum Summit, the UN Environment Programme (UNEP) and S&P Global unveiled the '*Nature Risk Profile*', a novel methodology whose foundation is rooted in which framework?

- a) Kunming-Montreal Global Biodiversity Framework
- b) Paris Agreement on Climate Change
- c) Sustainable Development Goals (SDGs)
- d) Kyoto Protocol

Correct Answer: A**Your Answer:** Unanswered**Marks:** 0/1.00**Explanation****Solution (a)**

**Explanation:****Nature Risk Profile**

- The 'Nature Risk Profile', a new methodology developed by the UN Environment Programme (UNEP) and S&P Global, was launched at the Davos World Economic Forum Summit.
- This methodology is based on the **Kunming-Montreal Global Biodiversity Framework (GBF)**, providing scientifically robust and actionable analytics on companies' impacts and dependencies on nature. **(Hence option a) is correct)**
- The Nature Risk Profile aims to assist the financial sector in measuring and addressing nature-related risks, considering that half of the world's GDP is highly reliant on nature.
- Biodiversity loss is a growing concern for global business leaders, as highlighted in the World Economic Forum's 2023 Global Risks Report.
- UNEP, headquartered in Nairobi, Kenya, is responsible for coordinating environmental responses within the United Nations system and was established after the 1972 United Nations Conference on the Human Environment in Stockholm, under the leadership of Maurice Strong.

QUESTION 87.

With reference to the 14th meeting of the Conference of the Contracting Parties (COP14) to the Ramsar Convention on Wetlands, consider the following statements:

1. The meeting brought attention to the fact that significant portion (75%) of wetlands designated as Ramsar Sites has outdated information, encompassing sites that are at risk due to human activities.
2. It is also famously known as Wuhan Declaration.
3. There is a significant increase in the number of outdated Ramsar sites compared to previous COP meetings.

How many of the given statements is/are incorrect?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation**Solution (d)****Explanation:**

14th meeting of the Conference of the Contracting Parties (COP14) to the Ramsar Convention on Wetlands

- During the 14th meeting of the Conference of the Contracting Parties (COP14) to the Ramsar Convention on Wetlands, which is being jointly hosted by Wuhan (China) and Geneva (Switzerland) from November 5 to 13, 2022, significant outcomes were achieved, including the adoption of the Wuhan Declaration and the release of a report highlighting the status of Ramsar sites.
- Many Ramsar Sites of International Importance lack information or have missing data.
- Countries are urged to reassess these wetlands to gather up-to-date information.
- **75% of wetlands listed as Ramsar Sites have outdated information**, including sites threatened by human activities. **(Hence statement 1 is correct)**
- As of June 30, 2022, there are 2,439 Ramsar sites covering an area larger than Algeria.
- Outdated or missing information was found for 1,826 Ramsar Sites.
- Updates for at least 1,225 Ramsar Sites have not been submitted through the online Ramsar Information Sheets (RIS) since January 2015.
- There is a significant increase in the number of outdated RIS compared to previous COP meetings. **(Hence statement 3 is correct)**
- Information for approximately 775 sites was last updated 18 years ago.

About the Wuhan Declaration:

- The Wuhan Declaration emphasizes the need for strong political will and practical outcomes to conserve, restore, manage, and sustainably use wetlands. **(Hence statement 2 is correct).**
- It calls for additional resources to implement the Ramsar Convention's strategic plan and increase impact-oriented actions by 2030.
- Wetlands are recognized as vulnerable to sea level rise, coral bleaching, and changing hydrology, making their conservation critical for global climate change and sustainable development commitments. The Wuhan Declaration aims to address these issues.

QUESTION 88.

With reference to the 'Climate Change Performance Index (2023)', consider the following statements:

1. The Climate Change Performance Index (CCPI) released annually by the World Meteorological Organization (WMO).
2. India made progress in the CCPI 2023 by moving up to the eighth position, an improvement from its previous ranking of 10th in 2022.

3. Denmark secured the top spot in the CCPI 2023 followed by Sweden.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

· The Climate Change Performance Index (CCPI) is released annually (since 2005) at the UN Climate Change Conference by **Germanwatch, New Climate Institute, and Climate Action Network based in Germany. (Hence statement 1 is incorrect)**

· The CCPI assesses the climate protection performance of 59 countries and the European Union, which together contribute to 92% of global greenhouse gas emissions.

· It evaluates countries based on 14 indicators in four categories: GHG Emissions, Renewable Energy, Energy Use, and Climate Policy.

· **None of the countries achieved a top-three ranking in the overall standings .**

· Denmark **secured the fourth position with a score of 79.61** , followed by Sweden at fifth place with 73.28 points. **(Hence statement 3 is correct)**

· Chile climbed three ranks to reach the sixth position, receiving high ratings for Renewable Energy and GHG Emissions, and medium ratings for Climate Policy and Energy Use.

· Russia performed poorly due to its heavy reliance on fossil fuels and low contribution from renewable energy sources, exacerbated by the global energy crisis caused by its invasion of Ukraine.

· **India improved its position to eighth place in the CCPI 2023, with a score of 67.35 points, compared to its previous rankings of 10th in 2022 and 2021 and 9th in 2020. (Hence statement 2 is correct).**

· India ranked 9th in the Greenhouse Gas Emissions category, 24th in Renewable Energy, 9th in Energy Use, and 8th in Climate Policy.

· India has been ranked amongst top 5 countries in the world, and the best among the G20 countries.

· Denmark, Sweden, Chile and Morocco -the only four small countries that were ranked above India as 4th, 5th, 6th and 7th respectively. **The first, second and third ranks were not awarded to any country.** In effect therefore, India's rank is the best amongst all large economies.

QUESTION 89.

With reference to the 'International Biofuel Alliance', consider the following statements:

1. United States of America has launched the International Biofuel Alliance with the support of the India and Brazil, showcasing its leadership in emission reduction efforts.
2. India has set a goal to reach a 40% ethanol blending in gasoline by 2025.

Which of the given statements is/are correct?

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

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

International Biofuel Alliance

· **During the G20 presidency, India is set to launch the International Biofuel Alliance, similar to the International Solar Alliance**, with the backing of the USA and Brazil, as India takes a leading role in emission reduction initiatives. India will be hosting the G20 meeting in September 2023 in New Delhi. **(Hence statement 1 is incorrect)**

· In its 2023-24 Budget, India allocated 4.3 billion USD towards achieving its net-zero targets.

· Objective of the Biofuel Alliance is to enhance the production of biofuels.

Significance of Brazil and the US:

· The USA and Brazil are the world's largest biofuel markets.

· The USA ranks first and Brazil second in biofuel production.

· They are leaders in biodiesel and ethanol production, accounting for a significant portion of global production.

India's Biofuel Goals:

· **India aims to achieve a 20% ethanol blend in gasoline by 2025. (Hence statement 2 is incorrect)**

· The country has been progressively increasing its ethanol blend, starting from 0.67% in 2013 to 10% in 2022.

- Brazil has already achieved 100% ethanol fuels.
- Additionally, India is focusing on establishing hydrogen hubs, with the state of Kerala leading the way by allocating a significant portion of its budget to establish a hydrogen hub in Thiruvananthapuram.

QUESTION 90.

With reference to the recent 'Ozone Recovery Assessment Report', 2022, consider the following statements:

1. The report was jointly prepared by WMO, UNEP, NOAA, NASA, and the European Commission.
2. The report highlights the ongoing increase in total tropospheric chlorine and bromine from long-lived ozone-depleting substances (ODSs), which plays a significant role in global warming.
3. The study highlights an uneven progress in ozone recovery, with the upper stratosphere demonstrating stronger restoration compared to the middle and lower stratospheric zones in both the northern and southern hemispheres.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Ozone Recovery Assessment Report, 2022

- The ozone layer's recovery is in the news due to the release of a United Nations-backed Ozone Recovery Assessment Report, 2022.
- The report indicates that ozone-depleting substances (ODS) levels in 2022 have returned to the levels observed in 1980 before significant ozone depletion occurred.
- This progress has been achieved over the past three decades through the implementation of the Montreal Protocol.
- The reduction in ozone-depleting substances over Antarctica, which experiences a large ozone hole in spring, has been slower.

- The report was a collaborative effort by **WMO, UNEP, NOAA, NASA, and the European Commission. (Hence statement 1 is correct)**
- Key findings of the report include the **continued decline of total tropospheric chlorine and bromine from long-lived ODSs**, which contributes to global warming mitigation. **(Hence statement 2 is incorrect)**
- The study suggests that the decline in ODS emissions due to compliance with the Montreal Protocol will avoid approximately 0.5-1 °C of global warming by mid-century.
- The report expects the thickness of the ozone layer to return to 1980 values around 2066 in the Antarctic and around 2045 in the Arctic region.
- Challenges highlighted in the report include gaps in assessment and monitoring networks for certain ozone-depleting compounds and unexplained emissions of other ODSs.
- **Disparity in ozone recovery is observed, with the upper stratosphere showing better recovery compared to the middle and lower stratospheric zones in both hemispheres . (Hence statement 3 is correct)**
- Gaps in regional atmospheric monitoring make it challenging to assess specific regional variations in ozone-depleting substances.
- The impact of geo-engineering techniques, such as stratospheric aerosol injection (SAI), on the ozone layer raises concerns about the deepening of the Antarctic ozone hole and delays in recovery.
- Steps taken to heal the ozone hole include the Vienna Convention (1985) and the Montreal Protocol (1987), which aim to reduce and eliminate ozone-depleting substances worldwide.
- The implementation of these initiatives has significantly reduced the production and consumption of ozone-depleting substances.
- The Ozone Fund, established in 1990, supports developing countries in phasing out the use of ozone-depleting substances.
- The Kigali Amendment to the Montreal Protocol (2016) focuses on the phase-down of hydrofluorocarbons (HFCs), powerful greenhouse gases used as replacements for HCFCs and CFCs.
- The Kigali Amendment enhances the Montreal Protocol's effectiveness in combating global warming.

QUESTION 91.

With reference to the Sustainable Aquaculture in Mangrove Ecosystem (SAIME) Initiative and Traditional Shrimp Cultivation Practices in coastal areas, what distinguishes the SAIME Initiative from Traditional Shrimp Cultivation Practices?

- a) It involves the use of advanced aquaculture technology.



- b) It encourages the clearing of mangrove forests for shrimp ponds.
- c) It focuses on community-based sustainable practices.
- d) It aims to maximize shrimp production through intensive farming methods.

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Sustainable Aquaculture in Mangrove Ecosystem (SAIME) Initiative

- An innovative approach to sustainable shrimp cultivation offers a ray of hope for mangrove restoration in the Sundarbans.
- **SAIME is a community-based pilot project in West Bengal, where farmers are actively engaged in planting mangrove trees around shrimp ponds. (Hence option c) is more suitable answer)**
- o Traditionally, mangrove forests are cleared to make room for shrimp farming in these areas.
- o The initiative is spearheaded by organizations such as the Nature Environment and Wildlife Society (NEWS), Global Nature Fund, and others.
- o Its primary objective is to rejuvenate and conserve the mangrove ecosystem.
- Mangroves constitute a diverse group of trees and shrubs that thrive in the coastal intertidal zone.
- o They play a vital role in preventing erosion and acting as a natural barrier against storm surges during severe weather events.

QUESTION 92.

With reference to 'Nano Urea', consider the following statements:

1. It is categorized as a nano-fertilizer comprising nano-sized nitrogen particles ranging from 20 to 50 nm, which are uniformly dispersed in water.
2. The Indian Farmers Fertiliser Cooperative Limited (IFFCO) and Nano Biotechnology Research Centre (NBRC), played a key role in the indigenous development of Nano Urea.
3. Nano urea addresses the concern of excessive nitrogen use in agriculture by providing nitrogen use efficiency (NUE) of over 80%.

How many of the given statements is/are correct?

- a) One only



- b) Two only
- c) All three
- d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

Nano Urea

- The recent news highlights the presence of Nano Urea in the spotlight as the Union Minister of Chemicals and Fertilizers inaugurates the IFFCO Nano Urea Liquid Plants in Uttar Pradesh
- The establishment of these plants will expand the production capacity of nano urea.
- The current production capacity of nano urea is over 50 million bottles per year.
- The Parliamentary Standing Committee on Chemicals and Fertilizers has recommended the use of nano-fertilizers for sustainable crop production and soil health.
- **Nano Urea is a type of nano-fertilizer that contains nano nitrogen particles of size range 20-50 nm dispersed in water. (Hence statement 1 is correct)**
- The Ministry of Agriculture & Family Welfare recognized Nano Urea as a nano fertilizer in 2021 under the Fertilizer Control Order (FCO), 1985.
- Nano Urea was developed indigenously at the Indian Farmers Fertiliser Cooperative Limited (**IFFCO**) - **Nano Biotechnology Research Centre (NBRC) in Kalol**, Gujarat. **(Hence statement 2 is correct)**
- Each bottle of Nano Urea (liquid) contains a total nitrogen concentration of 4% (40,000 ppm).
- The formation of nano urea utilizes "organic polymers" to keep the nitrogen nanoparticles stable for plant spraying.
- Nano Urea does not receive government subsidies, resulting in cost savings for the government.
- Nano Urea is relevant for addressing the challenge of increasing food production while maintaining nitrogen use efficiency (NUE).
- **Excessive nitrogen use in agriculture is a concern, and nano urea offers an NUE of more than 80%. (Hence statement 3 is correct)**
- Nano Urea's unique properties, such as quantum effects and increased surface area, allow for more efficient delivery of nitrogen.

QUESTION 93.

Recently the Ministry of Commerce and Industry has initiated additional onsite measures to address irregularities in organic farming certification, with respect to this, which of the following government initiative supports cluster-based organic farming with Participatory Guarantee System (PGS) certification?

- a) ParamparagatKrishiVikasYojana (PKVY)
- b) National Mission on Oilseeds and Oil Palm (NMOOP)
- c) Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)
- d) National Food Security Mission (NFSM)

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

Organic Farming Certification:

Why in News?

- The Ministry of Commerce and Industry has initiated additional onsite measures to address irregularities in organic farming certification.
- This action is a response to observed irregularities in certification activities.

Benefits of Organic Farming: On Environment:

- Prohibits Use of Harmful Pesticides: Organic farming avoids chemical fertilizers, pesticides, additives, and preservatives.
- Maintains Healthy Soil: Compost with beneficial bacteria helps improve soil quality.
- Reduces Erosion: Limiting tillage prevents soil erosion.
- Provides Cleaner Water: Avoiding harmful chemicals in organic farming helps keep the water supply safe and clean.
- Stimulates Biodiversity: Organic farming promotes a diverse ecosystem of plants, animals, and microorganisms.

On Farmers:

- Attracts More Customers: Growing interest in organic products domestically and internationally benefits farmers.
- Reduces Input Costs: Organic farming uses 45% less energy compared to traditional methods.

For Consumers:

· Chemical-Free Produce: Organic produce is free from harmful chemicals and pesticides, posing no health risks.

· Nutritional Benefits: Organic produce tends to have higher levels of vitamins, minerals, fatty acids, and phytonutrients.

Challenges in Implementing Organic Farming across India:

· Lower Yields and Productivity: Organic farm yields are typically lower than conventional agriculture, impacting productivity and income.

· Limited Organic Manure Availability: Scaling up organic farming requires increased production of organic manure, posing challenges in cattle rearing and its environmental impact.

· Unpredictable Weather: Dependence on rainfed agriculture makes conventional farming more suitable due to unpredictable weather patterns.

· Pressure on Natural Habitats: Expanding organic farming would require more land, potentially leading to habitat conversion and loss.

· Impact on Food Security: Shifting more land to organic farming may increase production costs, making food less affordable for the economically disadvantaged.

Steps taken by the Government to Improve Organic Farming:

· ParamparagatKrishiVikasYojana (PKVY): Promotes cluster-based organic farming with Participatory Guarantee System (PGS) certification. **(Hence option a) is correct)**

· Mission Organic Value Chain Development for North Eastern Region (MOVCDNER): Supports third-party certified organic farming in the northeast region through Farmers Producer organizations (FPOs) with a focus on exports.

· National Mission on Oilseeds and Oil Palm (NMOOP): Provides financial assistance for various components, including bio-fertilizers and vermicompost.

· National Food Security Mission (NFSM): Supports the promotion of bio-fertilizers.

· Financial Assistance for Certification: Offers financial aid to individual farmers for Participatory Guarantee System (PGS) certification or National Programme for Organic Production (NPOP) certification.

· Modern Organic Testing Lab in Sikkim: The government plans to establish a high-quality modern organic testing laboratory in Sikkim to promote organic produce.

QUESTION 94.

A company claims to be 'Carbon Neutral'. What does this mean?

- a) The company no longer uses carbon-based fuels.
- b) The company has reduced its carbon emissions to zero.

- c) The company is offsetting its carbon emissions by investing in renewable energy projects.
d) The company has balanced its carbon emissions with an equivalent amount of carbon removals.

Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Carbon Neutral

· When a company claims to be carbon neutral, it means that they have taken measures to mitigate or offset their carbon emissions. Carbon emissions are produced when a company uses carbon-based fuels or engages in activities that release carbon dioxide into the atmosphere. **To achieve carbon neutrality, the company ensures that the total amount of carbon dioxide emissions it produces is offset by an equivalent amount of carbon removals. (Hence option d) is correct)**

· Offsetting carbon emissions involves investing in projects or activities that remove or reduce greenhouse gas emissions elsewhere. These projects can include activities like reforestation, afforestation, investing in renewable energy projects, or supporting technologies that capture and store carbon dioxide. The aim is to balance out the company's emissions by removing or reducing an equivalent amount of carbon dioxide from the atmosphere.

· By achieving carbon neutrality, a company demonstrates its commitment to minimizing its impact on climate change. It acknowledges the environmental consequences of its activities and takes responsibility for them by actively working to counterbalance its carbon emissions.

QUESTION 95.

With reference to the 'Animal Birth Control (ABC) Rules, 2023', consider the following statements:

1. It is released by the Ministry of Environment, Forest and Climate Change (MoEFCC).
2. Local bodies such as municipalities, municipal corporations, and panchayats are responsible for carrying out ABC programs.
3. The rules provide guidelines for managing conflicts between humans and stray dogs without resorting to dog relocation.

How many of the given statements is/are correct?

- a) One only
b) Two only
c) All three

d) None

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Animal Birth Control Rules, 2023

The issuance of the Animal Birth Control Rules, 2023 **by the Ministry of Fisheries, Animal Husbandry & Dairying** has garnered attention for the following reasons **(Hence statement 1 is incorrect)**:

- The alarming number of stray dog bite cases and associated issues has highlighted the need for effective measures.
- The rules aim to address concerns raised by the Supreme Court and provide a framework for implementing ABC programs.
- The emphasis on animal welfare and guidelines to manage conflicts without relocating dogs showcases a proactive approach.
- The news reflects the government's efforts to tackle the challenges posed by stray dogs while ensuring their well-being.

Background:

- India witnessed a significant number of street/stray dog bite cases, with approximately 160 million cases recorded between 2019 and 2022.
- This has resulted in retaliatory crimes, acts of cruelty against dogs, caregivers, and feeders, as well as conflicts among urban residents.

Provisions of the Rules:

- The Animal Birth Control Rules, 2023 replace the Animal Birth Control (Dog) Rules, 2001 and are issued under the Prevention of Cruelty to Animals Act, 1960.
- These rules are formulated based on the guidelines provided by the Supreme Court, specifically the Animal Welfare Board of India and People for Elimination of Stray Troubles.
- The Supreme Court has emphasized that relocating dogs is not permissible.
- The rules focus on implementing Animal Birth Control (ABC) programs for sterilization and immunization of stray dogs.
- **Local bodies such as municipalities, municipal corporations, and panchayats are responsible for carrying out ABC programs. (Hence statement 2 is correct)**
- Municipal corporations are required to collaborate on implementing ABC and Anti-Rabies Programs.

· The rules provide guidelines for managing conflicts between humans and stray dogs without resorting to dog relocation. (Hence statement 3 is correct)

· They also emphasize the importance of addressing cruelty during ABC programs, ensuring animal welfare.

QUESTION 96.

With reference to the Carbon Border Adjustment Mechanism (CBAM), consider the following statements:

1. The world's first Carbon Border Adjustment Mechanism (CBAM) has been established by the United Nations to tackle the problem of carbon leakage.
2. The concept of carbon pricing is expanded to include imported goods.
3. India has set a goal of achieving carbon neutrality by 2070.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Carbon Border Adjustment Mechanism (CBAM) and its Impact:

Introduction of CBAM:

- The EU has approved the world's first Carbon Border Adjustment Mechanism (CBAM) to prevent "carbon leakage." (Hence statement 1 is incorrect)
- CBAM imposes a carbon tax on imports of goods created using non-green or environmentally unsustainable technologies.
- It aims to incentivize trading partners to adopt decarbonization measures.

Scope and Implementation:

- CBAM will initially cover specific products in carbon-intensive sectors.

· It extends the concept of **carbon pricing to imported goods for the first time** . (Hence **statement 2 is correct**)

· The levy mirrors the EU's carbon market price to prevent carbon leakage.

Sectors Covered by CBAM:

· Initially, CBAM will apply to products in sectors at risk of carbon leakage, including iron and steel (including downstream products), cement, fertilizers, aluminum, electricity, and hydrogen.

CBAM and EU Climate Goals:

· CBAM is part of the "Fit for 55 in 2030 package," which aims to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.

· The EU's primary mechanism for incentivizing industry to decarbonize is through carbon pricing.

Concerns and Impact on India:

· Developing countries like India, **targeting carbon neutrality by 2070** , criticize CBAM as a trade-restrictive policy. (Hence **statement 3 is correct**)

· India has raised concerns at international forums, emphasizing non-discriminatory treatment and warning against protectionist practices.

Expected Challenges for India:

· India's exports of energy-intensive goods, including steel, aluminum, cement, and fertilizers, are anticipated to be significantly affected by the EU's adoption of CBAM.

· Indian exporters may face increased pricing, reduced competitiveness, and decreased demand in the EU market.

· CBAM implementation poses a significant challenge to India's metal sector, which heavily exports to the EU.

Mitigation Strategies for India:

· India needs to establish a carbon pricing mechanism, develop low-carbon technology, and enhance global competitiveness while reducing the impact of CBAM.

· Adhering to CBAM rules, reducing the carbon intensity of products, and exploring new markets are essential for Indian companies.

QUESTION 97.

Consider the following statements with respect to the National Lake Conservation Plan (NLCP):

1. The Ministry of Environment and Forests has been implementing the NLCP to conserve and manage polluted and degraded lakes in urban and semi-urban areas.

2. The Ministry identified polluted and degraded lakes for conservation based on state priorities and justifications, with the priority list subject to periodic revisions by state governments in response to dynamic circumstances.

3. The funding pattern involves the Indian government covering up to 70% of the project costs, with states contributing 30% and local authorities contributing up to 10%.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) All three
- d) None

Correct Answer: C

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (c)

Explanation:

National Lake Conservation Plan (NLCP):

Purpose and Integration:

· The **Ministry of Environment and Forests has been implementing the NLCP** since 2001 to conserve and manage polluted and degraded lakes in urban and semi-urban areas. **(Hence statement 1 is correct)**

· The NLCP was integrated with the National Wetlands Conservation Programme to avoid overlap, promote synergies, and enhance conservation and management efforts.

Goals and Scope:

· The NLCP aims to conserve aquatic ecosystems (lakes and wetlands) by implementing long-term conservation plans guided by uniform policies and guidelines.

· It focuses on achieving desired water quality enhancement, biodiversity improvement, and ecosystem preservation.

· The program includes activities such as inventory and information systems, directive formulation, regulatory frameworks, capacity building, evaluation, etc.

Objectives of NLCP:

· Comprehensive conservation and restoration of lakes and wetlands to enhance water quality and promote biodiversity and ecosystems.

· Integrated and interdisciplinary strategies with a shared regulatory framework.

· Promotion of biodiversity, reduction of pollutant loads, and provision of services related to lakes and wetlands.

Activities Covered:

- Intercepting, diverting, and treating pollution loads entering the lakes to prevent pollution from point sources.
- In situ lake cleaning techniques like desilting, de-weeding, bioremediation, aeration, etc., based on site characteristics.
- Catchment area treatment including reforestation, stormwater drainage, silt traps, etc.
- Reinforcing bunds and lake barriers, shoreline construction, and eco-development along the lakefront.
- Prevention of pollution from non-point sources through affordable sanitation and waste management.
- Public participation, awareness campaigns, research, capacity building, and training.

Prioritization of Lakes:

- Due to limited resources, priority is given to lakes and catchments to initiate conservation programs.
- **The Ministry identified 62 polluted and degraded lakes for conservation across the country, considering state priorities and justifications.**
- **State governments periodically revise and finalize the priority list based on dynamic circumstances. (Hence statement 2 is correct)**

Funding Pattern:

- The NLCP project costs are shared between the National River Conservation Directorate (NRCD), the Indian government, state governments, and local authorities.
- NRCD or **the Indian government covers up to 70% of the project costs, while states contribute 30%, and local authorities contribute up to 10%. (Hence statement 3 is correct)**
- Synergy is maintained between NLCP and other funding sources if sewerage and sewage treatment are included.
- The funding split is 60:40 between the central and state governments if internal sewerage is part of the project.
- Government land is preferably utilized for infrastructure development, and R&D tasks can be conducted in collaboration with academic institutions.

QUESTION 98.

Which of the following is/are example of social forestry?

1. Planting trees along highways for shade and beautification
2. Establishing community-managed forests for sustainable resource use
3. Creating national parks and wildlife sanctuaries
4. Promoting agroforestry systems in rural areas

Select the correct answer by using the code below:

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

Correct Answer: A

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (a)

Explanation:

- Social forestry primarily focuses on the management and utilization of forests and trees outside traditional forest areas to meet environmental, social, and rural development objectives. It involves active participation and engagement of local communities.
- Planting trees along highways for shade and beautification is an example of social forestry as it serves multiple purposes, including environmental enhancement and providing benefits to the local communities . **(Hence statement 1 is correct)**
- Establishing community-managed forests for sustainable resource use is another example of social forestry. It involves empowering local communities to manage and utilize forest resources sustainably, ensuring their participation and benefits. **(Hence statement 2 is correct)**
- Creating national parks and wildlife sanctuaries, on the other hand, **is not considered a part of social forestry** . These protected areas are primarily established for biodiversity conservation and preservation of natural ecosystems rather than addressing social or rural development goals. **(Hence statement 3 is incorrect)**
- Promoting agroforestry systems in rural areas is also an example of social forestry. Agroforestry integrates trees with agricultural practices to improve productivity, ecosystem resilience, and livelihoods of rural communities. **(Hence statement 4 is correct)**

Social Forestry and its Important:

- Social forestry, coined by J.C. Westoby, involves managing and protecting forests, afforestation on barren lands, and practicing forestry outside conventional forest areas to support environmental, social, and rural development.
- The National Commission on Agriculture (NCA, 1976) recognized it as a crucial component of forestry for meeting rural needs.

Importance of Social Forestry:

- Social forestry offers an alternative approach to forest management, balancing local community needs with external interests.
- It promotes sustainable forest use and management among communities residing near forests.
- Empowers communities by raising awareness, building capacity, establishing policies in collaboration with locals, and respecting their rights and knowledge systems.
- Provides communities access to forest resources and benefits in exchange for their participation in sustainable forest management.

Benefits of Social Forestry:

- **Increased Biodiversity:** Growing trees in barren lands within communities helps increase forest coverage, contributing to biodiversity preservation.
- **Carbon Removal:** Trees act as carbon sinks, playing a crucial role in removing carbon from the environment and combating global warming, particularly in urban settings.
- **Curbing Global Warming:** Areas with tree cover have lower temperatures, reducing energy consumption and combating global warming.
- **Soil Conservation:** Tree roots prevent soil erosion by holding the soil in place, mitigating the negative effects of erosion.
- **Health Benefits:** Trees and nature provide natural stress relief, improving mental well-being and offering other health benefits.
- **Noise Pollution Reduction:** Social forestry in urban areas helps mitigate the effects of noise pollution by reflecting and absorbing sound energy.
- **Improved Air Quality:** Apart from carbon dioxide removal, social forestry contributes to cleaning and enhancing air quality.

QUESTION 99.

With reference to the 'Comprehensive Environmental Pollution Index' (CEPI), consider the following statements:

1. The National Green Tribunal conducts periodic monitoring in Polluted Industrial Areas through recognized environmental laboratories to assess Comprehensive Environmental Pollution Index based on monitoring data.
2. Red Industrial Sectors are characterized by Pollution Index scores equal to or exceeding 60.

Which of the given statements is/are correct?

- a) 1 only

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

Correct Answer: B

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (b)

Explanation:

Comprehensive Environmental Pollution Index (CEPI)

- The Central Pollution Control Board (CPCB) has developed the Comprehensive Environmental Pollution Index (CEPI).
- In 2009, in collaboration with the Ministry of Environment, Forest, and Climate Change (MoEF&CC), 88 prominent industrial clusters were identified for CEPI analysis.
- Out of these clusters, 43 in 17 states with CEPI scores of 70 or higher are identified as Critically Polluted Areas (CPAs).
- Additionally, 32 clusters with CEPI scores between 60 and 70 are classified as Severely Polluted Areas (SPAs).
- **CPCB conducts periodic monitoring in Polluted Industrial Areas (PIAs) through recognized environmental laboratories to assess CEPI based on monitoring data. (Hence statement 1 is incorrect)**
- CEPI evaluation reflects the environmental quality of industrial areas and serves as a measure of progress in implementing action plans.
- Three rounds of monitoring have been conducted (2009, 2011, 2013) to assess CEPI based on the Comprehensive Environmental Pollution Index ratings of contaminated industrial clusters.
- Effective implementation of corrective action plans will help reduce pollution and restore the environmental quality of industrial clusters.
- Further investigation is needed to determine the spatial boundaries and extent of eco-geological damage in polluted industrial clusters/areas.

Comprehensive Environmental Pollution Index (CEPI) - Working:

- The Working Group established industrial sector classification criteria based on the Pollution Index, which considers emissions, effluents, hazardous waste, and resource consumption.
- Criteria for industrial sector classification based on the 'Range of Pollution Index' were finalized after consultations with CPCBs, SPCBs, and the MoEFCC.
- **Red Industrial Sectors: Pollution Index scores of 60 or above . (Hence statement 2 is correct)**
- Orange Industrial Sectors: Pollution Index scores ranging from 41 to 59.

- Green Industrial Sectors: Pollution Index scores ranging from 21 to 40.
- White Industrial Sectors: Pollution Index scores of 10 or above.

Comprehensive Environmental Pollution Index (CEPI) - Recent Updates:

- The Centre for Science and Environment (CSE), based in Delhi, evaluated CEPI ratings in Tamil Nadu.
- Groundwater in Tamil Nadu's industrial zones is becoming increasingly contaminated, with Vellore identified as the most polluted district in terms of river pollution.
- Five industrial clusters in Tamil Nadu have water scores exceeding 50 according to the CEPI water score 2018.
- Vellore-North Arcot, Manali, and Tiruppur are identified as 'critically polluted places' with CEPI individual scores of 60 or more.
- Cuddalore and Coimbatore are classified as severely polluted places with CEPI individual scores ranging from 50 to 60.
- Groundwater contamination mainly stems from calcium, chloride, and iron, associated with sewage and tannery pollution, posing significant risks.

QUESTION 100.

Consider the following statements with respect to how 'Permaculture Differs from Organic Farming':

1. Permaculture operates through an open-production system, where energy is optimally utilized by one element before being passed on to another, whereas organic farming commonly adopts closed-production systems.
2. Permaculture heavily relies on observation and has the ability to adapt to diverse situations, whereas organic farming adheres to predetermined farming norms.
3. Permaculture places emphasis on integrated pest and disease management, while organic farming necessitates continuous monitoring and control of pests and diseases.
4. In permaculture, the garden functions to support the thriving of nature by providing shade, wind deflection, and air filtration, whereas in organic farming, the garden is primarily utilized for production purposes.

How many of the given statements is/are correct?

- a) One only
- b) Two only
- c) Three only
- d) All four



Correct Answer: D

Your Answer: Unanswered

Marks: 0/1.00

Explanation

Solution (d)

Explanation:

Permaculture:

- **Comprehensive and Integrated:** Permaculture is a highly comprehensive and integrated system analysis and design methodology that offers a holistic approach to various aspects of human ecosystems.
- **Ecosystem Creation and Restoration:** It can be applied to create productive ecosystems for human use or to aid in the recovery and restoration of degraded ecosystems, promoting their health and wildness.
- **Applicability in Any Ecosystem:** Permaculture can be implemented in any ecosystem, regardless of its level of degradation or condition.
- **Valuing Traditional Knowledge:** Traditional knowledge and experience are highly valued and validated within the framework of permaculture.
- **Incorporating Sustainable Practices:** Permaculture incorporates sustainable agriculture practices, as well as land management techniques and strategies from different parts of the world.
- **Bridging Traditional and Emerging Cultures:** It serves as a bridge between traditional and emerging earth-tuned cultures, integrating their wisdom and practices.
- **Advocating Pesticide-Free Agriculture:** Permaculture strongly advocates for pesticide-free organic agriculture, promoting the use of natural and regenerative methods.
- **Maximizing Synergistic Interactions:** Permaculture emphasizes maximizing symbiotic and synergistic interactions among different components within a site or system.
- **Site-Specific Design:** It is designed to suit the specific location, client, and cultural context, taking into account the unique characteristics and needs of each setting.

How Permaculture Differs from Organic Farming:

- **Permaculture as a Complex System:** Permaculture encompasses a complex and dynamic system that can be practiced at different levels and through various methods, making it more comprehensive than organic farming.
- **Beyond gardening and Farming:** Permaculture extends beyond organic gardening and farming methods by integrating the home and garden into a system that has a reduced environmental impact.
- **Open-Production System:** Permaculture employs an open-production system, where energy is efficiently used by one element before being transferred to another, while organic farming often utilizes closed-production systems . (Hence statement 1 is correct)

· **Mimicking Nature:** Permaculture takes a holistic approach to mimic nature by maintaining water, soil, and genetic capital, whereas organic farming focuses on avoiding chemical inputs and environmental interference.

· **Observation vs. Norms:** Permaculture relies heavily on observation and can be adapted to different situations, whereas organic farming is based on predetermined farming norms . (Hence statement 2 is correct)

· **Range of Goods:** Permaculture produces a wider range of goods, including food, recreation, fuel, and habitat, while organic farming yields fewer goods but with better yields per item.

· **Maturation and Use:** In organic farming, produce typically matures all at once, whereas permaculture allows for maturation and use at different periods throughout the year.

· **Pest and Disease Management:** Permaculture emphasizes integrated pest and disease management, while organic farming requires ongoing monitoring and control of pests and diseases . (Hence statement 3 is correct)

· **Purpose of the Garden :** In permaculture, the garden serves to help nature thrive by providing shade, deflecting wind, and filtering air, whereas in organic farming, the garden is primarily used for production . (Hence statement 4 is correct)

· **Water Influence:** Water greatly influences the design of the garden in permaculture, while in organic farming, it is primarily used for irrigation.

· **Sharing Harvest:** In permaculture, the produce and harvest are shared with working animals, whereas in organic farming, the entire harvest is typically delivered to the market or consumed for human use.



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