Environmental Science [Official]

CISCE

(English Medium)

Academic Year: 2023-2024

Date & Time: 22nd March 2024, 11:00 am

Duration: 2h **Marks: 80**

1. Answers to this Paper must be written on the answer sheet provided separately.
2. You will not be allowed to write during the first 15 minutes.
3. This time is to be spent reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Attempt all questions from Section A and any four questions from Section B.
6. The intended marks for questions or parts of questions are given in brackets []

SECTION-A (40 MARKS) (Attempt all questions from this Section.)

Question 1. Choose the correct answers to the questions from the given options. (Do not copy the questions, write the correct answer only.)

1.1. The mechanical device which reduces air pollution from industries is _____

1. Two stroke engines
2. Catalytic converter
3. Solar panels
4. Electrostatic precipitator

Solution

The mechanical device which reduces air pollution from industries is the electrostatic precipitator.

Explanation:

An electrostatic precipitator (ESP) is a filtering device that uses electrical energy to charge particles positively or negatively in a gas stream, removing tiny particles such as smoke

and dust. The charged particles are subsequently drawn to collector plates that have the opposite charge. It is the most widely used device for air pollution management.

1.2. Captive breeding is a means _____.

1. to protect wild animals in forests
2. to restore extinct species
3. to breed wild animals in zoos and botanical gardens
4. to allow animals to breed in natural habitat

Solution

Captive breeding is a means to breed wild animals in zoos and botanical gardens.

Explanation:

Captive breeding, sometimes known as "conservation breeding," is the practice of preserving endangered plants and animals in a controlled environment, such as zoos, aquariums, botanical gardens and other similar facilities, away from their native habitats. The breeding of endangered animals occurs in controlled circumstances with the goal of boosting their population.

1.3. Choose the incorrect pair from the following:

1. Organic fertilizers → Agricultural residue
2. Composting → Organic wastes
3. Vermicomposting → Earthworms
4. Green manure → Chemical compounds

Solution

Green manure → Chemical compounds

Explanation:

Green manure is plants, including various leguminous and nonleguminous crops, produced in the field and then ploughed into the soil. This procedure enriches the soil with nitrogen, phosphorus, calcium, sulphur, and other minerals. Microorganisms degrade the complex organic stuff that plants contain. Green manure does not contain any chemicals.

1.4. An ecocity is _____.

1. A satellite city of an urban area
2. A rural area linked to a city
3. A less populated city
4. A sustainable city

Solution

An ecocity is a sustainable city.

Explanation:

An eco-city is a human settlement that focuses on resilient, self-sustaining ecosystems and natural settings. It strives to provide a livable and healthy human habitat while using no more renewable resources than it consumes.

1.5. Match each item in Column I with one item in Column II and choose the correct answer:

	Column I		Column II
1.	Montreal Protocol	A.	Empowerment of women
2.	Cairo Conference	B.	Protection of animals
3.	Global Environmental Facility	C.	Funds for climate change
4.	Cities	D.	Ozone depleted substances

1. 1 - A, 2 - B, 3 - C, 4 - D
2. 1 - B, 2 - A, 3 - D, 4 - C
3. 1 - D, 2 - A, 3 - C, 4 - B
4. 1 - C, 2 - B, 3 - A, 4 – D

Solution

1 - D, 2 - A, 3 - C, 4 - B

Explanation:

1. The Montreal Protocol restricts the production, consumption and emission of chemicals that deplete ozone in the stratosphere.
2. The Cairo Conference's most significant achievement has been its understanding of the need to empower women.
3. The Global Environment Facility (GEF) is a financial mechanism founded in 1991 that provides grants and funds to developing countries for environmental projects and activities.
4. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between nations. Its goal is to ensure that international trading in wild animal and plant specimens does not jeopardise the existence of the species.

1.6. The reason for poor standard of living and mainutrition in India is _____.

1. Over population
2. Environmental conditions
3. Absence of natural resources
4. Poor economy of rural India

Solution

The reason for poor standard of living and mainutrition in India is over population.

Explanation:

The standard of living in India is influenced by a variety of factors, but overpopulation is a significant contributor.

1.7. Assertion (A): MNC's made better infrastructure, brought employment and reduced the gap between the developed and developing nations.
Reason: MNCs exploited the resources and acquired land, thus destroying the ecology.

1. A is True and R is False.
2. A is False and R is True.
3. Both A and R are True and R is the correct explanation of A.
4. Both A and R are True but R is not the correct explanation of A.

Solution

Both A and R are True but R is not the correct explanation of A.

Explanation:

Multinational corporations provide jobs and bring capital to developing countries. However, multinational corporations have an impact on the environment by increasing carbon emissions and resource use, such as water and electricity, which leads to environmental depletion. Thus, both claim and reason are true, but reason is not the proper explanation for the assertion.

1.8. Which source of electricity generation is least harmful to the environment?

1. Coal
2. Nuclear energy
3. Gasoline
4. Diesel

Solution

Nuclear energy

Explanation:

Renewable energy is normally regarded as the least detrimental to the environment. Nuclear energy is the least hazardous source of energy among coal, diesel and gasoline. It produces no greenhouse gas emissions. When fossil fuels such as coal, natural gas and oil are used, they emit carbon dioxide (CO_2) and other pollutants, which contribute significantly to climate change, air pollution and other environmental issues.

1.9. The figure given alongside refers to a major International Conference on the environment. This was held in _____.

1. Kyoto in Japan
2. Rio de Janeiro in Brazil
3. Cairo in Egypt
4. Montreal in Canada

Solution

The figure given alongside refers to a major International Conference on the environment. This was held in Rio de Janeiro in Brazil.

Explanation:

The United Nations Conference on Environment and Development (UNCED), also known as the Rio Summit, Rio Conference, and Earth Summit, was a major United Nations conference held in Rio de Janeiro, Brazil from 3 to 14 June 1992.

1.10. Biomass refers to _____.

1. Plant waste, animal waste, and agricultural residue
2. Industrial waste
3. Biagas plant
4. Fertilizers and pesticides

Solution

Biomass refers to plant waste, animal waste, and agricultural residue.

Explanation:

Biomass wastes include forestry leftovers, agricultural wastes, animal wastes, industrial wastes, Municipal Solid Waste (MSW), and food processing wastes.

1.11. Assertion (A): The satellite imagery is used for collecting data on environmental damage.
Reason (R): This data collection helps in marketing and selling of forest products.

1. Both A and R are true statements.
2. A is false and R is true.
3. Both A and R are true and R is the correct reason for A.
4. A is true but R is not the correct reason for A.

Solution

A is true but R is not the correct reason for A.

Explanation:

Satellite imaging may capture a variety of data, such as land cover, vegetation, soil, water, climate and biodiversity. Satellite imaging can be used to detect environmental harm on a global scale by examining changes in land cover and use over time.

1.12. The main objective of IRDP is _____.

1. Improvement in banking
2. Alleviation of rural poverty
3. Development of rutal youth
4. Employment to retired persons

Solution

The main objective of IRDP is alleviation of rural poverty.

Explanation:

The Integral Rural Development Programme (IRDP) is a comprehensive and integrated approach to promoting rural development. The Indian government launched and executed it in 1980. The programme's goal is to eliminate poverty and raise the standard of living in rural communities, as well as to offer impoverished people job opportunities and the opportunity to broaden their skill sets in order to improve their living conditions.

1.13. Many urban centres have landfull sites, and often, waste is not disposed in these sites.' In this context which of the following improves solid waste management:

1. Teaching people the importance of segregation
2. Hospital waste to be gathered collectively
3. Composting is a bad option
4. Staff handling the wastes should be discouraged

Solution

Teaching people the importance of segregation

Explanation:

Divining municipal solid waste into four categories-hazardous, recyclable, inorganic, and organic is known as segregation. It is a must since it allows the treatment, recycling, and scientific disposal of several waste products.

1.14. Extensive planting of trees on barren land to increase forest cover is called _____.

1. Reforestation
2. Afforestation
3. Deforestation
4. Energy plantations

Solution

Extensive planting of trees on barren land to increase forest cover is called afforestation.

Explanation:

Afforestation is the practice of bringing trees and tree seedlings to an area not yet covered with forests.

1.15. Given below are a few methods of conservation of resources. Choose the correct method of soil conservation:

1. Metal recycling
2. Triple drip irrigation
3. Mulching and dry farming
4. Shifting cultivation

Solution

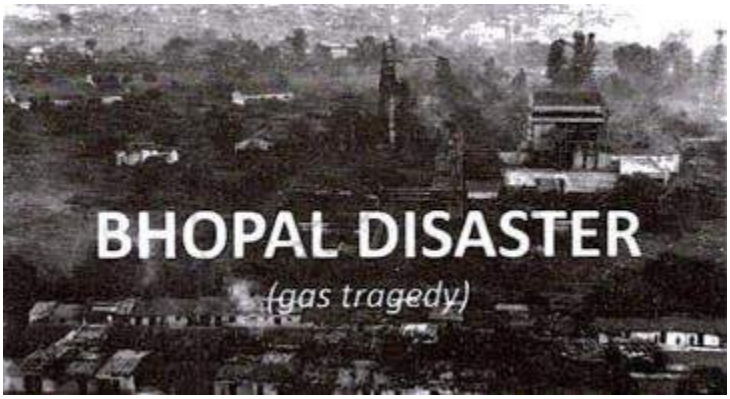
Mulching and dry farming

Explanation:

Dry farming is usually referred to as agricultural cultivation without irrigation during the dry season. Dry farming is practiced in areas with limited rainfall or water availability. Farmers use a variety of tools and strategies to compensate for moisture deficiencies throughout the crop cycle. Dryland crops include millets (such as pearl millet and sorghum), pulses (like chickpeas and lentils), drought-tolerant wheat and barley types

and oilseeds (such as sunflower and sesame). These crops have evolved to tolerate water scarcity and thrive in dryland conditions.

1.16.



What was the main cause of this tragedy?

1. The factory was located in an isolated area
2. The company exported tested and good technology to the f ndian plant
3. Trained and knowledgeable staff
4. Safety checks were less frequent due to shortage of staff

Solution

Safety checks were less frequent due to shortage of staff.

Explanation:

UCIL was a pesticide facility that produced carbaryl utilising Methyl Isocyanate (MIC). MIC is a highly poisonous substance that poses a severe risk to human health. The Indian government accused UCIL of violating safety laws and neglecting to carry out routine maintenance and safety measures. The plant's safety measures for the extremely poisonous MIC were not in operation during the buildup to the leak.

Question 2.

2.1. Why is LPG more popular to use as a fuel? Write two advantages of it.

Solution

LPG is more popular to use as a fuel because of the following reasons:

The caloric value is higher. LPG has a calorific value of approximately 55,000 kJ per kg. When lighted, LPG burns entirely, leaving no residue or particle matter. LPG has a lower impact on air pollution than other fuels.

2.2. What are the two causes for rise of population in India?

Solution

Causes of rise of population in India are:

One of the primary causes of India's population expansion is a decrease in mortality as a result of improved medical facilities and a constant birth rate. People's average life spans have increased as a result of immunisation programmes used to combat epidemics.
In metropolitan areas, populations have grown as a result of industrialization and more possibilities.

2.3. "Most slum residents in urban area are better off than the rural poor." Give any two advantages the slum residents have over rural poor.

Solution

Slums are usually the only economical and accessible sort of settlement for the poor in cities, where competition for land and profits is fierce. Slum people enjoy the following benefits over the rural poor:

i. Greater job opportunities than rural areas.
ii. The government provides better educational and medical facilities for the children.

2.4. State any two reasons to prove landfills are not environment friendly.

Solution

Landfills are not environment friendly because of the following reasons:

i. Landfills release methane, carbon dioxide, water vapour, trace quantities of oxygen, nitrogen, hydrogen and non-methane organic substances. If these gases are not controlled, they have the potential to contribute to climate change and produce pollution.

ii. Furthermore, industrial and household cleaning products are disposed of in landfills as a toxic mixture. Rain occasionally washes these chemicals away, accumulating them and possibly transporting them to municipal water systems, where they can contaminate groundwater.

Question 3.

3.1. Give any two advantages of efficient land use planning.

Solution

The advantages of efficient land use planning are:

i. It guarantees the effective use of the land: Given that land is a finite resource, it is imperative to exercise caution in its utilisation. Land planning is a viable method for ensuring that land is not squandered and is put to the most viable use.
ii. To protect the environment: Land planning can contribute to environmental protection by guaranteeing that development is sustainable. As an illustration, land planning may be implemented to safeguard delicate ecosystems, including forests and wetlands.

3.2. How is organic manure made?

Solution

Organic matter is a mixture of various decomposed organic substances, such as waste matter, animal bones, fossil remains, etc. Microorganisms are responsible for the breakdown of this substance. Organic foods are a major source of organic matter, which provides nutrients in small quantities, but they are used in large quantities by us.

OR

State one benefit of organic manure.

Solution

Benefits of organic manures:

I. They provide organic matter to the soil and thus improve the physical and chemical conditions of the soil.
II. Organic manures do not create soil pollution.

III. Organic manures help in maintaining soil texture, improve aeration and retention of water.

Question 4.

4.1. Mention any two principles of sustainable development.

Solution

A sustainable system means a system which can be continued with no ill effects. The principles of Sustainable Development are:

1. Respect and care for all forms of life.
2. Improve the quality of human life.
3. Minimise the depletion of natural resources.
4. Conserve the earth's vitality and diversity.
5. Enable communities to care for their own environment.
6. Change your personal attitude and practices towards the environment.

4.2. Name the energy that is produced by the rise and fall of ocean water.

Solution

The surge of ocean waters during the rise and fall of tides is what produces tidal energy. The high and low tides occur due to the moon's gravitational pull.

OR

What is the advantage of tidal energy?

Solution

Tidal energy is a renewable energy source that releases no CO_2, is predictable and produces a high power output.

4.3. What are biodegradable wastes?

Solution

Biodegradable wastes are those that can be degraded by both abiotic (oxygen, UV radiation and temperature) and biotic (bacteria, fungus and other microorganisms)

components. Food wastes, kitchen wastes and other natural wastes are a few examples of this type of waste.

OR

How are these biodegradable wastes helpful?

Solution

Biodegradable waste is used to produce energy manure, compost and biogas.

4.4. Write any two contributions of private enterprises in city improvement.

Solution

Private enterprises have contributed in the city improvement in the following ways:

i. The private sector's primary purpose is to protect the interests of society's most vulnerable members, promote economic progress, and supply residents with basic goods and services.
ii. Private firms have a significant role in the economic development of impoverished cities.

Question5

5.1. The vehicular traffic is a major problem in metro cities. Write two ways in which traffic congestion affects environment.

Solution

Traffic congestion has a significant impact worldwide.

Affects of traffic congestion on the environment:

1. Traffic congestion increases fuel consumption, air pollution and carbon dioxide emissions, all of which harm the environment. Congestion also increases travel times.
2. Lost time in traffic has a negative impact on society, the economy and productivity.

OR

The vehicular traffic is a major problem in metro cities. Suggest three methods to reduce traffic on roads.

Solution

Ways to reduce traffic congestion:

i. **Promote public transport:** Increased motorization causes traffic congestion. Public transport is one of the most effective solutions to alleviate traffic congestion in urban areas. To encourage people to use public transit, it must be made more passenger-friendly. Buses should be less packed, more formal and noiseless.
ii. **Improved infrastructure:** flyovers, bypass highways and flyover bridges are being created to alleviate traffic congestion in major cities.
iii. **Use of micromobility:** Micromobility refers to compact, lightweight vehicles with speeds less than 30 km/hour. Because of their compactness, mobility and effectiveness in short-distance urban commutes, they outperform traditional modes of transportation, especially since they are insensitive to traffic congestion.

5.2. Sanitary landfill and incineration are two methods of waste disposal. Briefly describe the two processes. Suggest any other ecofriendly method of waste disposal of biodegradable wastes.

Solution

1. **Sanitary landfill:** A sanitary landfill is a method of disposing of waste. Trash can be disposed of on land in a sanitary landfill without producing nuisances or jeopardising public health and safety. The rubbish is disposed of in areas that have already deteriorated or need to be restored in the most environmentally friendly way possible. One advantage of employing a sanitary landfill is that it separates solid trash from the surrounding soil and water. The disadvantages of a sanitary landfill include the negative impacts of leachate and methane gas leaks, as well as ecosystem destruction on the landfill site.

   To ensure safe disposal, the waste in a sanitary landfill follows the steps below:

a. The sanitary landfill starts with a liner that works as a barrier, keeping leachate from damaging soil and groundwater near the landfill site.

b. Aerobic bacteria consume the available oxygen in the early stages of their activity, raising the temperature. The second step establishes anaerobic conditions, resulting in the formation of carbon dioxide and hydrogen.

c. Phase three sees the development of the bacterial population and the onset of methanogenic activity, which is the process by which organic matter degrades to produce methane.

d. After the organic material is depleted in the fifth phase, the system resumes its aerobic state.

e. Over time, the waste decomposes beneath the soil. Decomposition byproducts, such as leachate and methane gases, are environmentally hazardous. Methane collection systems reduce greenhouse gas emissions. Leachate collection systems help keep groundwater and soil clean.

2. **Incineration:** Incineration is the process of burning or combusting domestic waste, often known as non-hazardous Municipal Solid Waste (MSW). Waste-to-energy plants burn waste in incinerators. The garbage is disposed of and the heat produced by burning it is used to generate energy. The incineration process begins with the material being delivered to the waste-to-energy facility and stored in a trash storage bunker, also known as the pit. The garbage is separated and shredded. A powerful magnet sweeps through the garbage, removing valuable metals that may be recycled. The waste is then pushed into the primary chamber, also known as the combustion chamber and burned at temperatures around 1500 degrees Fahrenheit. The garbage is transformed into ash. Water is pumped through the exterior of the combustion chamber, where it is converted to steam due to the intense heat generated. The steam is then sent to a generator system to spin a turbine, producing energy. Incinerators are recognised as waste-to-energy plants due to their ability to generate power.

Question 6.

6.1. What is terracing?

Solution

Terrace farming is the practice of constructing stepped terraces on mountain slopes, converting sloping soil into small flat levels for farming purposes. The soil is kept in this form of farming by building small earthen, stone or concrete walls. Terrace farming produces paddy, cereals, fruits, vegetables, flowers, medicinal plants, aromatic plants, dye plants, wheat, maize, rice, pulses, oilseeds and other crops. The most important fruit crops include apples, subtropical and temperate fruits, nuts and dried fruits. Tea and hops are significant economic crops in the western Himalayan highlands.

OR

Where is terracing practiced?

Solution

Terrace farming has been practiced in China, Japan, the Philippines and other areas of Oceania and Southeast Asia; around the Mediterranean; in parts of Africa; and in the Andes of South America In India, it is practiced in hilly areas -Himachal Pradesh, Uttarakhand and northeastern states.

OR

State three advantages of terracing.

Solution

The advantages of terrace farming are:

1. **Soil Erosion Control:** One of the fundamental purposes of terrace farming is to prevent water from running off too quickly, which can lead to severe soil erosion on sloping ground. Water travels slower down terraced soil because it might sink into the earth, reducing the quantity of topsoil washed away.
2. **Water Conservation:** In locations with unpredictable rainfall, terraces can help retain water, which is essential for agriculture. This technology reduces the need for artificial irrigation while ensuring efficient water utilisation.
3. **Greater Agricultural Land:** Farming can be challenging in hilly or mountainous places due to steep slopes. Building terraces can transform formerly unproductive slopes into productive farming areas. The primary goal of terrace farming is to

keep soil from being washed away by rain or carried off by wind. Terrace farming improves soil quality and fertility, allows agriculture in difficult terrain, reduces water runoff and increases production.

6.2.'Biogas is produced by the fermentation of biodegradable wastes'. Mention any three advantages of using biogas.

Solution

The term "biogas" refers to a collection of gases produced during the anaerobic breakdown of organic materials such as food waste, plant residue, municipal rubbish, and agricultural waste. Biogas is composed of methane, carbon dioxide, moisture, and trace amounts of hydrogen sulphide.

Advantages of Biogas:

i. Clean energy source: Biogas, produced through bio-digestion, is a renewable, non-polluting, and clean energy source. It actually cuts greenhouse gas emissions. Thus, using waste gas as a source of energy is an excellent strategy to counteract global warming.
ii. Non-polluting: Biogas burns without generating smoke, therefore, no hazardous gases such as CO_2, CO, NO_2, or SO_2 are created.
iii. Cuts Down on Landfills: The waste product left over from the biogas generation process can be used as manure in fields. There is no need for landfill sites because the disposal method is efficient and safe.
iv. Renewable source of energy: Biogas is a renewable source of energy since it is produced from waste, which is an infinite process.

OR

'Biogas is produced by the fermentation of biodegradable wastes'. Mention any two disadvantages of using biogas.

Solution

The term "biogas" refers to a collection of gases produced during the anaerobic breakdown of organic materials such as food waste, plant residue, municipal rubbish, and agricultural waste. Biogas is composed of methane, carbon dioxide, moisture, and trace amounts of hydrogen sulphide.

Disadvantages of Biogas:

i. **Not efficient when used on a wide scale:** Because it is difficult to improve biogas efficiency on a large scale, it is not financially feasible.
ii. **Impurities:** Even after several purification processes, there are still many impurities that are difficult to control. When compressed biogas is used as fuel, it causes extensive damage to the container.
iii. **Unstable and dangerous:** When methane is exposed to oxygen, it violently reacts to generate carbon dioxide. Methane is extremely combustible, making it prone to explosions.

Question 7.

7.1. What are the aims of Integrated Pest Management (IPM)?

Solution

The concept of Integrated Pest Management (IPM) emerged in reaction to mounting data and public concern over heavy pesticide use. IPM is an environmentally friendly method that employs a number of tactics, including biological control, habitat modification, cultural practice modification and the use of resistant cultivars, to prevent pests or the harm they cause in the long run. IPM also recommends the use of natural insecticides. Plants, animals, fungus and bacteria can all produce naturally occurring pesticides. The goals of IPM include lowering management costs, avoiding or reducing environmental pollution and preserving ecological balance with little disruption to the ecosystem.

OR

Write three advantages of Integrated Pest Management (IPM).

Solution

i. **Lowers the residue of pesticides:** IPM enhances food and water safety by reducing pesticide application, resulting in less residues in food, feed, fibre and the surrounding environment.
ii. **Applies sustainable pest control:** IPM improves ecosystem services like pest predation while protecting others like pollination. It also helps boost farm production and food availability by lowering pre- and post-harvest crop losses.

iii. **Increases revenue:** IPM reduces production expenses by utilising less pesticides. Better-quality crops attract better prices in the marketplace and have fewer residues, which can increase farmer profitability.

7.2. Differentiate between ex-situ and in-situ conservation.

Solution

	Ex-Situ Conservation	In-situ Conservation
1.	Refers to off-site conservation that involves man-made habitats.	Refers to on-site conservation that involves the natural habitats of organisms.
2.	Endangered species are particularly conserved.	It works well for animals that are widely dispersed, but it is not appropriate when a species' population is rapidly declining for any reason.
3.	It keeps the animals apart from the natural processes of continuous evolution and adaptation. Examples - Zoos, Cryopreservation DNA banks, aquariums, botanical gardens.	It helps to maintain the ongoing processes of evolution and adaptation that take place in the natural habitats of every species. Examples - National parks, wildlife sanctuaries, biosphere reserves.

OR

Give one example of in-situ conservation.

Solution

National parks, biosphere reserves, wildlife sanctuaries and sacred groves are examples of protected areas that practice in situ conservation.

OR

Write any two advantages of in-situ conservation.

Solution

The advantages of in-situ conservation are:

I. The wildlife species have been preserved in their natural habitats. They effortlessly integrate into their environment.
II. The ecosystem as a whole is preserved, not just one specific species.
III. It is a more cost-effective and practicable approach.
IV. Beneficial for the survival of a large number of species.
V. The likelihood of recovery is high.

Question 8.

8.1. List any two ecological impacts of urbanisation.

Solution

Urbanisation is the process by which cities grow and an increasing proportion of the population moves to them. Uncontrolled urbanisation in India has resulted in rapid environmental degradation, generating a slew of issues such as land insecurity, deteriorating water quality, excessive air pollution, noise, and waste disposal issues.

Some of the impacts of urbanisation on various aspects of the environment are:

1. **The Formation of a Heat Island:** Soil and vegetation absorb and reflect energy differently than concrete, asphalt, and bricks. Cities remain warm at night, even after the countryside has cooled.
2. **Changes in Air Quality:** Human activity causes the release of a range of pollutants into the atmosphere, including lead, sulphur oxides, nitrogen oxides, ozone, carbon dioxide and carbon monoxide.
3. **Different Precipitation Patterns:** Cities frequently receive more precipitation than rural regions because dust has the ability to condense water vapour into rain drops. Rural-urban linkages are the flows of goods, people, information, finance, waste, information or social relations across space that connect rural and urban areas. Stronger urban-rural collaboration has several advantages, including more sustainable land use and planning, improved services (public transport, health, education, etc.) and better natural resource management.

OR

What three measures can be adopted to strengthen rural-urban linkage?

Solution

Measures adopted to strengthen rural-urban linkages are:

i. Bridging the divide between rural and urban areas necessitates a diversified strategy. One strategy is to invest in infrastructure and services that improve access to resources in rural areas. This could involve upgrading mobility, enhancing healthcare access and expanding high-speed internet.

ii. Urbanisation raises food demand and encourages dietary changes in cities; new demand might provide chances for rural producers to better their livelihoods. Strengthening food supply networks can make a significant contribution to eradicating hunger and decreasing poverty.

iii. Farming requires easy access to markets, which are typically located in cities. Better market access can boost farming revenues and stimulate the transition to higher-value crops or livestock.

8.2. Write the expanded form of GMO.

Solution

GMO means Genetically Modified Organism. A genetically modified organism (GMO) is one whose DNA has been altered in the laboratory to promote the expression of desired physiological features or the creation of desired biological products.

OR

Write two benefits of GMO organisms.

Solution

1. Genetically modified organisms offer numerous potential environmental benefits. It contributes to reducing environmental harm. Certain genetically altered microorganisms, for example, are capable of producing biodegradable plastic. Ralstonia eutropha is a bacteria that transforms glucose and some other acids into a stretchy polymer. This polymer is used to make plastics.

2. Genetic engineering provides a time-saving approach for growing larger, higher-quality crops with less work and money. In certain cases, transgenic crops can reduce the requirement for chemical insecticides while considerably improving crop yields per acre. Plants carrying a gene from Bacillus thuringiensis, which generates a natural pesticide known as Bt toxin, have decreased the use of broad-spectrum insecticides in places where crops like potatoes, cotton and maize are grown.
3. Herbicide-resistant crops can reduce mechanical tillage and thereby, soil erosion.

OR

Write two problems associated with GMO organisms.

Solution

1. Despite the fact that Genetically Modified Organisms (GMOs) have numerous potential benefits for society, there has been debate about them, particularly in the food industry.
2. Genetic manipulation has the ability to change a crop's allergenic characteristics.
3. Concerns about the spread of modified agricultural genes to native flora and the creation of insecticide-resistant "superbugs" were related to older concerns.

Question 9.

9.1. What is Community Forestry?

Solution

"Community forestry" refers to individual or group forest and tree management activities carried out by residents on their own or privately leased land, on public land or on state territory. Local people have been working hard to maintain their habitats in order to ensure their long-term livelihoods.

OR

State two objectives of community forestry.

Solution

1. Involve local stakeholders and equip them with tools to manage their trees.

2. Local knowledge and traditional ecological practices are supported in order to protect sustainable forest resources.
3. Restoring genetic diversity in native tree species.
4. Preserving biodiversity and wildlife habitats.
5. Encouraging long-term economic growth by utilising forest products.

OR

How does community forestry benefit the community?

Solution

i. Forests provide for the needs of wildlife while also supporting livelihoods and offering a variety of ecosystem services, such as carbon storage and flood risk reduction. They use their own rules and procedures to safeguard wildlife from outside threats. They prohibit hunting animals.
ii. Farmers were able to diversify crop output by not using synthetic chemicals.
iii. Lower building heating and cooling costs.
iv. Increased outside contacts and activities helped to strengthen the community.
v. Increased air and water quality.

9.2. What is GEF?

Solution

GEF (Global Environment Facility) is a global finance organisation. It gives grants and concessional loans to underdeveloped countries to fund environmental projects. The GEF was founded at the 1992 Rio Earth Summit. Its headquarters are located in Washington, D.C.

OR

Explain any two areas of global environmental issues which are addressed by GEF.

Solution

The GEF's top priority areas include:

i. Biodiversity

ii. Climate change

iii. International waters

iv. Ozone depletion

v. Land degradation

vi. Persistent Organic Pollutants

Areas of global environmental issues which is addressed by GEF are:

1. The GEF is sponsoring an initiative to combat the illegal wildlife trade. The wildlife trade is a key cause of the spread of zoonotic illnesses.
2. To improve the management of transboundary freshwater resources and extensive marine habitats, GEF has launched its International Waters programme. It has also funded initiatives that bring various environmental benefits.

Question 10.

10.1. Suggest five methods by which we can reduce the cutting of trees or combat deforestation.

Solution

Trees are essential to the sustainability of our ecosystem in a variety of ways. There are several techniques to protect forests, including:

1. Replanting is the most effective method for halting deforestation. Participate in local or global tree-planting efforts.
2. The act of felling trees is prohibited.
3. Livestock farming is a significant driver of deforestation. Consider lowering your meat intake or purchasing products from sustainable farms.
4. Using renewable energy minimises the need for deforestation from mining and drilling.

5. Given the scale of deforestation, policies and restrictions at both the organisational and governmental levels should be adopted.
6. Organise instructional sessions on the effects of deforestation and promote awareness about sensitization. Reuse and recycle forest-derived items.

10.2. Read the following paragraph and answer the following questions:

Counter urbanization is a demographic and social process. Of late urbanization process in India is witnessing counter- urbanization in its life cycle. The counter-urbanization increases urbanism in physically rural areas. The growth in information technology, increase in car ownership over the last 40 years, more mobility, new business parks on the edge of cities, more people tend to move when they retire and so on are factors responsible for counter urbanization.

a. Mention any two causes associated with Counter Urbanization as given to the paragraph.
b. Write two more causes, other than the ones mentioned here, which you think lead people to return to rural areas.
c. What changes will be observed in rural areas as an effect of counter urbanization.

Solution

a. Counter urbanization is a demographic and socioeconomic trend in which individuals relocate from urban to rural areas.
The causes of counter-urbanisation are:
    1. Improvements in rural transport infrastructure and increased automobile ownership have given people more freedom of choice in where they live.
    2. As technology evolved, humans gained greater control over their lives; in many situations, the necessity to travel declined, as did the need to live in or frequent urban areas. The advancement of information and communication technology (e-mail, videoconferencing and broadband) has allowed people to work from home more freely.
b. **Some more causes of counter urbanization are:**

1. **Environmental Conditions:** Poor environmental conditions are well recognised to have a negative impact on health in industrial zones and the same is true in areas near mines. The living circumstances have a direct impact on the residents. Everyone aspires to live in a community with better living conditions and a higher standard of living. A city's failure to maintain key infrastructure, the advent of an epidemic or any other crisis affecting a significant number of people are all strong indicators of out-migration.
2. **Economic factors:** People relocate to cities in search of better work opportunities and cities are regarded as engines of economic growth. However, a city loses its appeal when it stops providing jobs and prospects for better income. This could be due to persistent business losses, policy changes, industry transformations, etc.

c. **The counter-urbanisation effect on rural areas includes the following:**

1. As country villages become more suburbanized, they have the potential to grow rapidly and lose their original character and charm.
2. Because the new residents own cars, demand for public transport will decrease. This can be a serious issue for village residents who lack their own transport, particularly the elderly.
3. Traffic congestion will worsen as a substantial proportion of migrants commute to work.
4. New residences will be erected on green fields, resulting in the removal of tress.