Short Answer Questions-I (PYQ)

[2 Marks]

Q.1. Thermal power plants are inevitable in an industrial and densely populated country like ours. What harm do they do to the environment? Also mention any precaution that could be taken to save our environment.

Ans. The particulate and gaseous pollutants are released from thermal power plants which lead to harmful effects. These pollutants can cause:

i. breathing or respiratory symptoms when inhaled.
ii. irritation, inflammations and damage to lungs and premature death.

Precautionary measures include use of electrostatic precipitators by which 99% of the particulate matters can be removed from the exhaust.

Q.2. How do automobiles fitted with catalytic converters reduce air pollution? Suggest the best fuel for such vehicles.

Ans. Catalytic converters have expensive metals like platinum-palladium and rhodium as catalysts. As exhaust emission passes through catalytic converter, unburnt hydrocarbons are converted into carbon dioxide and water, and carbon monoxide and nitric oxide are changed to carbon dioxide and nitrogen gas.

Unleaded petrol is the best fuel for such vehicles.

Q.3.

a. Name any two places where it is essential to install electrostatic precipitators. Why it is required to do so?
b. Mention one limitation of the electrostatic precipitator.

Ans.

a. It is essential to install electrostatic precipitators in thermal power plants and smelters to remove particulate matter.
b. Limitation of the electrostatic precipitator:
    i. particulate matter less than 2.5 micrometres are not removed.
    ii. velocity of air between plates must be low enough to allow the dust to fall.
    iii. it cannot work without electricity.

Q.4. What is polyblend? Why did the plastic manufacturers think of producing it? Write its usefulness.

Ans. Polyblend is a fine powder of recycled modified plastic. Polyblend was produced to recycle plastic waste. When blended with bitumen, polyblend can be used to lay roads that have increased road life.

Q.5. Mention how e-waste is produced and disposed off. Write the solution for its treatment.

OR

Name any two sources of e-wastes and write two different ways for their disposal.

OR

How e-wastes are being handled in our country? Write the correct solution for treating this waste.

Ans. Irreparable computers and other electronic goods are the known sources of electronic wastes (e-wastes). E-wastes are buried in landfills or incinerated. Recycling is the only solution for the treatment of e-wastes.

Q.6. How does an algal bloom cause eutrophication of a water body? Name the weed that can grow in such a eutrophic lake.

Ans. Algal bloom in the lake or any other water body forms a scum. The scum depletes the oxygen in the water leading to foul smelling of the water body. The oxygen depletion affects the aquatic life adversely resulting in the death of fish and ultimately the eutrophic lake itself dies. Water hyacinth grows in such a eutrophic lake.

Q.7. A crane had DDT level as 5 ppm in its body. What would happen to the population of such birds? Explain giving reasons.

OR

DDT content in the water of a lake that supplies drinking water to the nearby villages, is found to be 0.003 ppm. The kingfishers of that area were reported to have 2 ppm of DDT. Why has the concentration increased in these birds? What harm will this cause to the bird population? Name the phenomenon.

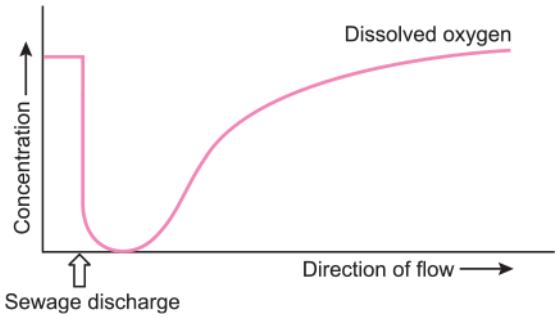
Ans. DDT being a toxic substance gets accumulated in the organism and passes on to the next higher trophic level because it cannot be metabolised or excreted. Thus, concentration of DDT has increased in the birds in the given case. The high concentration of DDT disturbs the calcium metabolism in birds, causes thinning of eggshells, their premature breaking and eventually causes a decline in the bird population.

The phenomenon is called biomagnification.

Q.8. Ornithologists observed decline in the bird population in an area near a lake after the setting of an industrial unit in the same area. Explain the cause responsible for the decline observed.

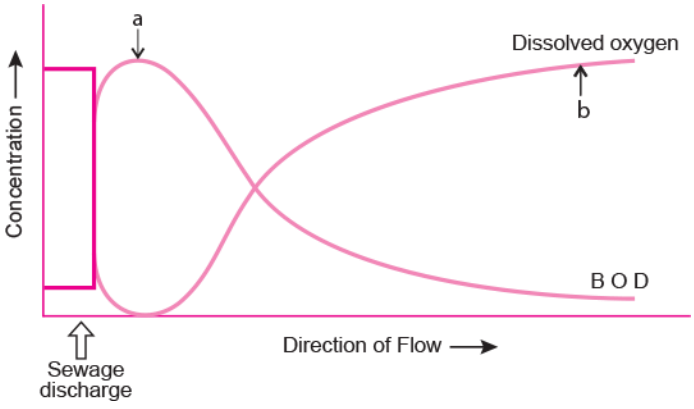
Ans. Harmful wastes from the industrial unit must have entered the trophic levels of food chain causing biomagnification. It must have accumulated in the birds as it can neither be metabolised nor be excreted. High concentration of harmful chemical may disturb calcium metabolism in birds causing thinning of the egg shells and their premature breaking, ultimately causing decline in bird populations.

Q.9. Study the graph given below. Explain how is oxygen concentration affected in the river when sewage is discharged into it.



Ans. When sewage is discharged into the river, the oxygen concentration declines sharply because a large amount of oxygen is consumed by aerobic microorganisms in river to decompose the organic matter in river. When the amount of organic matter reduces, the amount of dissolved oxygen again increases.

Q.10. Explain giving reasons the cause of appearance of peaks 'a' and 'b' in the graph shown below.



Ans. '*a*'–High BOD due to sewage discharge.
'*b*'–Increase in dissolved oxygen due to sewage decomposition.
Micro-organisms involved in biodegradation of organic matter consume a lot of oxygen,

therefore, there is a sharp decline in dissolved oxygen. When the sewage is completely degraded, oxygen concentration again increases.

Q.11. "Determination of Biological Oxygen Demand (BOD) can help in suggesting the quality of a water body." Explain.

Ans. High BOD of a water body indicates growth of more number of micro-organisms in water. This results in bad quality of water. Bad water quality will lead to death of aquatic creatures and hence more polluting potential. Whereas lower BOD of water body indicates less number of microorganisms in water. There is good quality of water in which aquatic life flourishes and there is less polluting potential.

The amount of oxygen required for microbial breakdown of biodegradable organic matter is called BOD.

Q.12. Lower BOD of a water body helps reappearance of clean-water organisms. Explain.

Ans. Lowering of Biological Oxygen Demand (BOD) results in decreased biodegradable material in the water body. This results in reduced microbial decomposition. When there is no decomposition, oxygen utilisation is reduced and there is more Dissolved Oxygen (DO) available. Thus, clean water-organisms reappear.

Q.13. Suppose sewage water is disposed off in the river. What will be its effect on BOD and dissolved oxygen.

OR

Sewage discharge into clean water body leads to increased fish mortality. Explain.

Ans. Discharge of sewage water into a river will increase nutrients and thereby promotes algal growth. This will result in rise of BOD (Biochemical Oxygen Demand) as decomposers will consume more dissolved oxygen in river. If sewage quantity is large, the whole of the dissolved oxygen will be consumed leaving nothing for respiration of fishes and other aquatic organisms. This increases the mortality rate of aquatic creatures.

Q.14. Explain the causes of global warming. Why is it a warning to mankind?

Ans. Global Warming

- The gradual continuous increase in average temperature of surface of the Earth as a result of increase in concentration of greenhouse gases is termed as global warming.
    i. **Cause**
        - Increase in the level of greenhouse gases (CO_2, CFCs, etc.) in the atmosphere. These gases allow the heat waves to reach earth but prevent their escape and thus the earth becomes warm.

ii. **Effects**

- The temperature of the earth has increased by 0.6°C in last three decades, which will lead to changes in precipitation patterns.
- Rise in temperature leads to deleterious changes in environment resulting in odd climatic changes called **El Nino effect**.
- The rise in temperature will lead to the increased melting of polar ice caps which will cause the rise in sea level and many coastal areas will be submerged.
- Increased temperature will lead to increased weed growth, eruption of diseases and pests. Thus, crop productivity will decrease.

Q.15. Explain the relationship between greenhouse gases and global warming.

Ans. Greenhouse gases (CO_2, CH_4, N_2O, CFCs) allow the solar radiations to enter but prevent the escape of heat radiations of longer wavelength. The absorbed radiations again come to earth's surface and heat it up. Increase in the level of these greenhouse gases allow the heat waves to reach earth but prevent their escape and thus the earth becomes warm. There is gradual continuous increase in average temperature of earth surface leading to global warming.

Q.16. Explain the relationship between CFCs and ozone in the stratosphere.

Ans. UV rays act on CFCs and release chlorine. These chlorine atoms act on ozone to release O_2, resulting in ozone layer depletion.

Q.17. List four benefits to human life by eliminating the use of CFCs.

Ans.

i. Delay in aging of skin
ii. Prevent damage to skin cells
iii. Prevent skin cancer
iv. Prevent snow blindness or inflammation of cornea
v. Prevent cataract
vi. Prevents ozone depletion
vii. Prevents global warming
viii. Reduces greenhouse effect
ix. Reduces odd climatic changes or El Nino effect.

Q.18. Chlorofluorocarbons (CFCs) are widely used as refrigerants. Then why is it suggested to reduce its emission as far as possible? Explain.

OR

Refrigerants are considered to be a necessity in modern living, but are said to be responsible for ozone holes detected in Antarctica. Justify.

Ans. CFCs find wide use as refrigerants. CFCs discharged in the lower part of atmosphere move upward and reach stratosphere. In stratosphere, UV rays act on them

releasing chloride atoms. Chloride atoms degrade ozone, releasing molecular oxygen. Whatever CFCs are added to the stratosphere have permanent and continuing effects on ozone. These have resulted in ozone hole.

Q.19. Why are there regular reminders to reduce the use of CFCs in the production of industrial and household appliances? Explain.

Ans. CFCs discharged in the lower part of atmosphere move upward and reach stratosphere. In stratosphere, UV rays act on them releasing Cl atoms, which in turn degrade ozone. Ozone depletion will result in entry of harmful UV-B radiations into the earth's atmosphere resulting in deleterious effects on all living organisms.

Q.20.

a. **State the cause of depletion of ozone layer.**
b. **Specify any two ill-effects that it can cause in the human body.**

Ans.

a. UV radiations act upon CFCs (chlorofluorocarbons) releasing Cl atoms in the stratosphere. These Cl atoms combine with O_3 and degrade it.
b. Ill-effects of ozone depletion:
    i. UV-B damages DNA and proteins of living organisms causing mutation.
    ii. It causes skin aging, skin cell damage and skin cancers.
    iii. UV-B is absorbed by human eye and at high dose it causes inflammation of cornea. This is called **snow-blindness** cataract.

Q.21.

a. **Rearrange the following greenhouse gases in increasing order of their relative contribution to the total global warming:N_2O; CFC; CO_2; C_2H_4**
b. **What is the effect of global warming on polar ice-caps? Comment on its possible ecological impact.**

Ans.

a. $C_2H_4 < N_2O < CFC < CO_2$
b. Global warming results in rise of atmospheric temperature. This leads to the increased melting of polar ice caps which will cause the rise in sea level and many coastal areas will be submerged.

Q.22. What is joint forest management? How can it help in conservation of forests?

Ans. Joint Forest Management (JFM) is a programme initiated by the Government of India in 1980 where government works closely with the local communities for protecting and managing forests. By this programme forests are conserved by locals in a

sustainable manner as locals are also benefited with forest products like fruits, gum, rubber, medicines, etc.

Q.23. How have human activities caused desertification? Explain.

Ans. Human activities like over-cultivation, unrestricted grazing, deforestation and poor irrigation practices result in arid patches of land. The fertile top soil that may take centuries to develop is eroded due to these activities. When large barren patches extend and meet over time, a desert is created. Increased urbanisation is also one of the causes of desertification.

Q.24. Write what was the percentage of forest cover of India at the beginning and at the end of the twentieth century. How different is it from the one recommended by the National Forest Policy of our country?

Ans. At the beginning of the twentieth century, forests covered about 30 % of the land of India. By the end of the century, it shrunk to 19.4 %, whereas the National Forest Policy (1988) of India has recommended 33 % forest cover for the plains and 67 % for the hills.

Q.25. Justify the need for signing of Montreal Protocol by the participating nations.

Ans. The Montreal Protocol was signed to control the emission of ozone depleting substances. Excessive use of CFCs and other ozone depleting chemicals has resulted in thinning of ozone layer. Further thinning would allow harmful UV-B radiations to enter Earth's atmosphere and have deleterious effects on living organisms.

Q.26. Answer the following questions:

Q. Why are the colourful polystyrene and plastic packaging used for protecting the food, considered an environmental menace?

Ans. The colourful polystyrene and plastic packaging are non-biodegradable and non-ecofriendly.

Q. Write about the remedy found for the efficient use of plastic waste by Ahmed Khan of Bangalore.

Ans. The remedy was found by developing polyblend, which is a fine powder of recycled modified plastic. Polyblend is mixed with bitumen to lay roads. This enhanced the water repellent property of bitumen and enhanced the life of roads.

Q.27. Answer the following questions:

Q. Name the green house gases that caused global warming.

Ans. CO_2, CH_4, N_2O, chlorofluorocarbons or CFCs

Q. Which of them has caused ozone hole and how?

Ans. Ozone degradation has increased due to chlorofluorocarbons (CFCs). CFCs are refrigerants which react with UV in stratosphere to release chloride atoms. Chloride atoms act as catalyst to degrade ozone and release molecular oxygen. CFCs have permanent and continued effect as chloride atoms are not consumed.

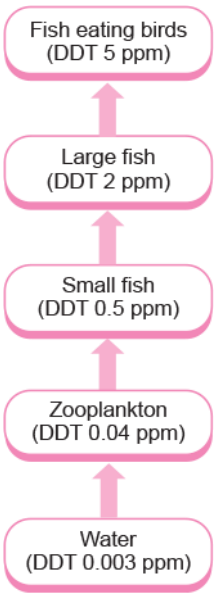
Q.28. Plenty of algal bloom is observed in a pond in your locality.

a. **Write what has caused this bloom and how does it affect the quality of water.**
b. **Suggest a preventive measure.**

Ans.

a. Presence of large amounts of nutrients (Nitrogen and Phosphorus) in water causes excessive growth of algae. This growth depletes dissolved oxygen in water and imparts distinct colour to the water bodies. The bloom forming algae are extremely toxic and deteriorates water quality resulting in fish mortality.
b. Following preventive measures can be carried out:
    i. Treatment of waste water before it reaches the pond.
    ii. Integrated waste water treatment.
    iii. Avoid using NPK fertilisers.
    iv. Use of organic or biodegradable manure or resort to organic farming.

Q.29. Study the given aquatic food chain and answer the questions that follow:



i. Give reasons why there is a continuous increase in the DDT content in different trophic levels of the chain.
ii. Name the phenomenon responsible for the increase in DDT content.

Ans.

i. DDT enters the food chain when they reach water. Since they are not degradable these get accumulated progressively at each trophic level. As they reach higher trophic levels, the concentration of DDT also increases.
ii. Biological magnification.

Short Answer Questions-I (OIQ)

[2 Mark]

Q.1. What is hybrid vehicle technology. Explain the advantages with a suitable example.

Ans. Vehicle running on dual mode like petrol and CNG are hybrid vehicle. As CNG is a green fuel there is conservation of fossil fuel and reduction in the environmental pollution.

Q.2. What can be the effect of discharging hot (thermal) water into a water body on the organisms in it?

Ans.

i. A number of organisms will die that are sensitive to high temperature.
ii. Hot water will reduce oxygen content of water and thus increased BOD will affect the aquatic animals.

Q.3. Differentiate between 'bad' ozone and 'good' ozone.

Ans.

S. No.	Bad ozone	Good ozone
(*i*)	The ozone found in the lower atmosphere is called bad ozone.	The ozone found in the stratosphere is called good ozone.
(*ii*)	It harms both plants and animals.	It absorbs UV radiation and protects the living organisms from its harmful effects.

Q.4. A person has inhaled air having particulate pollutants of size less than 2.5 micrometers in diameter. What could be the impact of their pollutants on his respiratory system?

Ans. Particulate pollutants inhaled deep into the lungs cause irritation, inflammation, damage to the lungs, and premature death.

Q.5. Is it true that if the dissolved oxygen level drops to zero the water will become septic? Given example which could lower the dissolved oxygen content of an aquatic body.

Ans. Yes, the water become septic if the dissolved oxygen drops to zero. Organic pollution (biodegradable) is an example.

Q.6. It is a common practice to plant tree and shrubs near the boundary walls of building. What purpose do they serve?

Ans. The plant growing near the boundary wall act as barrier for sound pollution and act as dust catchers.

Q.7. What is ozone shield and why is it important? Name the gases that cause stratospheric ozone depletion.

Ans. The thin layer of ozone around the atmosphere that prevents entry of harmful UV rays is called ozone shield. Ozone shield functions as a shield against strong UV radiations. The gases that cause ozone depletion are methane, nitrous oxide and chlorofluorocarbons.

Q.8. Name any one of the green house gases and its possible source of production on a large scale. What are the harmful effects of it?

Ans. CO_2 and Methane. CO_2 levels are increasing due to burning of fossil fuel leading to global warming.

Q.9. Which one gas is most abundant out of the four commonest greenhouse gases? Discuss the effect of this gas on the growth of plants.

Ans. Carbon dioxide is the most abundant (60 per cent) among greenhouse gases. With doubling of concentration growth of plants (carbon dioxide fixing) increases by 30 per cent in shortterm period. At higher concentration of CO_2, stomata close and hence transpiration rate will be reduced.

Q.10. What is meant by Jhum cultivation? Explain how it is responsible for deforestation.

Ans. In Jhum cultivation, farmers clear the trees of the forest and burn the plant remains. The ash of the burnt vegetation contains minerals and is used as fertiliser. The land is then used for farming or cattle grazing. After cultivation, farmers move to another area and this process is repeated. Thus, in north-eastern states of India, this practice has caused major deforestation.

Q.11. How do chlorofluorocarbons destroy ozone layer?

Ans. Chlorofluorocarbons (CFCs) break down in the presence of UV rays and produce active chlorine. The chlorine atoms break down ozone into molecular O_2, thereby depleting ozone layer.

Q.12. Describe *Chipko Movement*.

Ans. *Chipko* movement was started in Garhwal, Himalayas in 1974 by Shri Sundar Lal Bahuguna to prevent cutting down of trees. The leaders of *Chipko* Movement believe in 5 Fs–food, fodder, fuel, fertilisers and fibres provided by the forest.