

Long Answer Questions (PYQ)

[5 Marks]

Q.1. Explain biomagnification. How does the biomagnification of DDT affect the population of fish-eating birds?

Ans. Unknowingly some harmful chemicals enter our bodies through the food chain. We use several pesticides and other chemicals to protect our crops from diseases and pests. These chemicals are either washed down into the soil or into the water bodies. From the soil, these are absorbed by the plants along with water and minerals, and from the water bodies these are taken up by aquatic plants and animals. This is one of the ways in which they enter the food chain. As these chemicals are not degradable, these get accumulated progressively at each trophic level. As human beings occupy the topmost level in any food chain, the maximum concentration of these chemicals get accumulated in our bodies. This phenomenon is known as biological magnification.

The population of fish-eating birds living on the bank of a contaminated lake differs from those living on the bank of another lake free from such insecticides (DDT). DDT being highly poisonous caused the thinning of their egg-shells and population of birds declined. The phenomenon is known as biological magnification.

Q.2. Answer the following questions:

Q. What depletes ozone in the stratosphere? How does this affect human life?

Ans. Chlorofluorocarbons (CFCs) deplete ozone in the stratosphere.

UV(B) damages DNA causing mutation, skin cancer, inflammation of cornea, cataract, aging of skin, snow blindness.

Q. Explain biomagnification of DDT in an aquatic food chain. How does it affect the bird population?

Ans. If DDT leaches from the agricultural field, it gets into the water body (the concentration is 0.0003 ppm) and enters the food chain: zooplanktons (0.04 ppm) → small fish (0.05 ppm) → large fish (2 ppm) → any fish eating bird (5 ppm). Concentration of DDT increases along the food chain, reaching a high level in the top carnivore bird.

DDT concentration disturbs Ca^{++} metabolism, egg shells become thin, premature breaking resulting in decline in bird population.

Q.3. Answer the following questions:

Q. What is El Nino effect? Explain how it accounts for biodiversity loss.

Ans. El Nino effect refers to the odd climatic changes due to rise in temperature. It leads to increased melting of polar ice caps as well as other places like the Himalayan snow caps. This will result in a rise in sea level that can submerge many coastal areas. Thus, resulting in biodiversity loss.

Q. Explain any three measures that you as an individual would take, to reduce environmental pollution.

Ans. Measures to reduce environmental pollution

- i. Use of renewable energy resources.
- ii. Use of television and other gadgets at low pitch.
- iii. Minimum use of fossil fuel.
- iv. No tobacco smoking.
- v. Planting more trees.

Long Answer Questions (OIQ)

[5 Marks]

Q.1. Discuss the following:

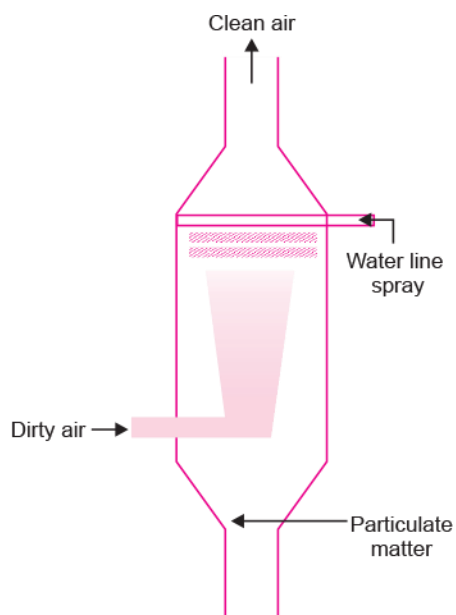
Q. *Chipko* Movement

Ans. *Chipko* Movement: *Chipko* movement (Hug the Trees Movement) was an organised resistance to the destruction of forests. It started in 1974 in Reni village of Garhwal. A contractor was allowed to cut trees in a forest near the village. When the contractor's workers appeared, the women of the village reached the forest quickly and clasped the tree trunks with their arms, preventing the workers from cutting down the trees. Mr. Sunder Lal Bahuguna, a Gandhian activist and philosopher was the leader of *Chipko* Movement.

Q. Scrubber

Ans. Scrubber:

- i. It is used to remove gases like sulphur dioxide from industrial exhaust.
- ii. The exhaust is passed through a spray of water or lime.
- iii. Water dissolves gases and lime reacts with sulphur dioxide to form a precipitate of calcium sulphate and sulphide.



Scrubber

Q. Radioactive wastes.

Ans. Radioactive wastes: Radioactive wastes such as uranium, are used as fuel in the atomic power plant. The accidental leakage and disposal of radioactive wastes are the most serious problems. All safety measures for this purpose should be strictly enforced. Highlevel radioactive wastes generate a lot of heat and thus require cooling, as well as special protective shield during handling and transport. Radiation, that is given off by nuclear wastes is extremely harmful to the organisms, because it causes mutation at a very high rate. At high doses, nuclear radiation is lethal but at lower doses, it creates various disorders, the most frequent of all being cancer. Therefore, nuclear waste is an extremely potent pollutant and has to be dealt with utmost caution.

Q.2. Explain the ways by which solid waste can be disposed.

Ans. Methods of Solid Waste Disposal

- i. **Open burning:** Municipal waste is reduced by burning in open dumps but the unburnt waste serve as the breeding ground for rats and flies.
- ii. **Sanitary landfills:** Wastes are dumped in a depression or trench after compaction and covered with dirt. But seepage of chemicals from these landfills can pollute underground water resources.
- iii. **Rag-pickers and kabadiwallahs:** Wastes are collected and separated out into reusable or recyclable categories.
- iv. **Natural breakdown:** The biodegradable materials are kept into deep pits in the ground for natural breakdown.
- v. **Recycling:** E-wastes can be recycled in specifically built factories or manually to recover important metals.

- vi. **Incineration:** Majority of e-wastes generated in developed world is exported to developing world where they are incinerated.

Q.3. What is integrated waste water management? Discuss its advantage.

Ans. Integrated Waste Water Treatment

- In the town of Arcata situated on northern coast of California, an integrated waste water treatment process was developed with the help of biologists from Humboldt State University
- The cleaning occurs in two stages:
 - i. The conventional sedimentation, filtration and chlorine treatments are given. The treated water still contains lots of heavy metals and other dangerous pollutants.
 - ii. Appropriate plants, algae, fungi and bacteria were grown in a marshland through which water was flowed. The various life forms neutralise, absorb and assimilate the pollutants and purify the water naturally.
- **‘Ecosan’** toilets have been developed in areas of Kerala and Sri Lanka for **ecological sanitation**.
- **Advantages of ecological sanitation:**
 - i. It is a practical, hygienic and efficient method of waste disposal.
 - ii. It is cost effective.
 - iii. Human excreta can be recycled into natural fertiliser to replace chemical fertiliser.

Q.4. What is meant by ozone shield? Name two ozone depleting substances. How do the ozonedepleting substances affect the ozone shield? Write one damaging effects of ozone depletion on humans and plants respectively.

Ans. The thin layer of ozone around the atmosphere that prevents entry of harmful UV rays is called ozone shield. Methane and CFCs are the two ozone depleting substances.

Chlorofluorocarbons (CFCs) release active chlorine (Cl atom) when acts with UV rays and Cl atoms degrade ozone releasing molecular oxygen. Depletion of ozone allows the entry of UV-B radiation to the earth which damages DNA causes mutation leading to skin cancer in humans and also rate of photosynthesis decreases in plants.