

Chapter-16

ENVIRONMENTAL ISSUES.

- Q1. Define pollution.
- A. Undesirable change in the environment physically, chemically and biologically due to the addition of pollutants.
- Q2. What are biodegradable pollutants ?
- A. The pollutants which are degraded in the nature by the microbes over a period of time.
- Q3. What are the primary components of acid rain ?
- A. Oxides of Sulphur, Oxides of and water.
- Q4. What is CNG ?
- A. CNG is Compressed Natural Gas which burns completely and is a good substitute for diesel.
- Q5. Define water pollution.
- A. An undesirable change in the nature of water rendering unfit for human consumption.
- Q6. Which of the pollutant element caused minamata disease ?
- A. Mercury.
- Q7. What is the effect of asbestos on animal and human health ?
- A. It causes gastric and intestinal cancer.
- Q8. Define eutrophication.
- A. It is a natural process of ageing of any waterbody due to the influx of rich nutrients.
- Q9. What is biomagnifications ?
- A. The process of accumulation of toxins in the cells and tissues with increased concentrations along the food chain.
- Q10. Expand DDT.
- A. Dichloro-Diphenyl-Trichloroethane.

- Q11. What are indicator species ? OR What are bioindicators ?
- A. Certain species whose presence or dominance foretell or predict the change in the environment in the near future.
- Q12. What is ecosan ?
- A. Ecosan is ecological sanitation. This approach is useful in converting the solid human excreta into manure.
- Q13. What is a solid waste ?
- A. Any garbage which is considered as useless.
- Q14. What is E-waste ?
- A. It is the electronic waste which includes irreparable components of electronic gadgets.
- Q15. Name the green house gases.
- A. Carbon dioxide, methane, Chloro-Fluoro-Carbon, ozone etc.
- Q16. What is global warming ?
- A. The raised atmospheric temperature by the increase in the concentration of green house gases.
- Q17. Who coined the term Green House Effect ?
- A. Arrhenius and J. Fourier in 1827.
- Q18. What is ozone hole ?
- A. Decrease in the thickness of ozone in the stratosphere due to CFC release.
- Q19. What are freons ?
- A. Chloro-Fluoro-Carbons are called freons.
- Q20. Name any one people's participation in the conservation of forests.
- A. Chipko movement in Uttarakhand, Joint Forest Management (JFM).

Model Questions of two / three marks each.

- Q1. Why is the load of biodegradable material dangerous to the water bodies?

A. When the large amount of sewage water enters into the ponds, rivers, lakes, seas and oceans, it reduces the amount of free oxygen. This depletes the respiratory oxygen levels and causes suffocation for aquatic fauna thereby killing aquatic life. BOD is measured to assess the quality of water with respect to the amount of organic load.

Q2. Explain the effects of air pollution.

A. Carbon monoxide pollutant - Inhalation of CO combines with haemoglobin of blood to form carboxy-haemoglobin which reduces the oxygen carrying capacity of blood.

Sulphur dioxide gas - Causes chlorosis, defoliation in plants. Irritation to throat & eyes, respiratory diseases in animals.

Q3. Briefly explain Biological Oxygen Demand in water.

A. When the water is eutrophic, BOD values cross 1.0 level. It is a test used to determine the amount of oxygen needed by microbes to breakdown organic matter completely into inorganic materials over a period of time. When the amount of organic load is more in the water the BOD value also increases.

Q4. Why is waste considered as hazardous and the major environmental issue ?

A. The wastes have increased immensely in the present time due to anthropocentric activities. As the industrialization produces maximum residues, the nature is not able to degrade it completely in the given period of time. Hence they accumulate and cause adverse effects to organisms including man. To overcome this havoc, waste depositories could be used where the wastes are compressed and buried underground which may be hazardous in the future days. Alternative method being incineration where wastes are burnt completely yet there is a risk of air pollution.

Q5. What are the reasons for the degradation of natural resources by improper resources utilization and maintenance ?

A. Soil erosion – removal of the fertile top soil by wind and water action, human interventions like modern agricultural practices, deforestation etc.

Desertification – degradation of fertile and into sterile barren land. It results in the destruction of natural vegetation cover making prone to erosion thereby losing the nutrients. The main causes are climatic changes, over grazing, intensive cultivation, deforestation, improper irrigation methods etc.

Water logging – irrigation without proper drainage makes water log. It brings underground salts to the surface. It is called soil salinity. When this is absorbed by the roots hinders the growth of the plants.

Model Questions of five marks each.

Q1. Discuss the causes and effects of global warming. What measures to be taken to control global warming ?.

A. The largest ecological unit is the biosphere. Global warming & green house effect are the two faces of a single coin. 'The raised atmospheric temperature by the increase in concentration of green house gases is global warming.' CO₂ & water vapour absorb IR radiation & become hot. PIERRE LAPLACE observed the operation of the atmosphere to a green house. The earth harbouring all forms of life is a green house. It is covered by an atmospheric blanket having gases. These gases reflect 30% of sun's heat & traps 70%. This is called green house effect. Water vapour, CO₂, N₂O, CH₄, O₃ gases are trapped by the atmosphere. These gases are called green house gases (GHGs). Increased global warming causes problem to all organisms.

Causes

It is caused mainly due to CO₂, automobiles, burning coals by power plants, soil erosion, desertification, increased CFC output into atmosphere etc.

Effects

The effects are extreme heat waves killing life. Arctic polar ice cap is declining at the rate of 9% per decade, rise is the sea level to flood certain countries like Bangladesh, Maldives etc. It causes food & water shortage. Destruction of underwater cities (coral reefs) & meadows result in extinction. But only in the colder climatic regions global warming brings comfort but in various other places its effect is negative.

Control measures

- Constructing green houses in winter for plants. The green house allows only light to enter into the house & the heat is kept inside the house. This provides warmth to the plants.
- Reforestation replaces maximum carbon dioxide by oxygen.
- Reduction of fossil fuel burning can minimize global warming.
- Hybrid gas electric engines can cut global warming by one third.
- Recycling products can conserve energy as they are made from used ones.
- Using natural resources like wind energy, solar energy and wave energy may help to overcome global warming.
- Conservation of energy by using eco-friendly bulbs, carpooling & adopting CFC free zone.

Q2. What is ozone layer? How will the enhanced ultraviolet radiation affect us ?

A. Ozone is a form of oxygen that is in the form of unstable O_3 gas which lies as a belt with pungent odour in the stratosphere of the earth's atmosphere. This layer absorbs ultraviolet radiation shorter than 290nm wavelength & prevents UV radiation from reaching the earth's surface.

It is also contributed by oxides of Nitrogen & hydrocarbons. Burning of fossil fuels contribute oxide of Nitrogen. Hydrocarbons & Nitrogen oxides react together in the presence of UV radiation resulting in Peroxy-Acetyl-Nitrate (PAN) & ozone, together they form photochemical smog.

Sulphate aerosol emitted through volcanic eruptions cause O_3 depletion. Chloro-Fluoro-Carbon from air conditioners, refrigerators, coolers, coolants cross the ozone & react with UV rays & chlorine is separated from CFC. And the chlorine atom attacks ozone and converts as many as 100,000 molecules of ozone into oxygen and nascent oxygen. (MOLINA CRUTZEN ROWLAND)

CFCs result in the formation of ozone holes through which UV radiation reaches earth's surface directly causing skin cancer, blindness, cataract, herpes, reduces immune functioning etc. Plants show reduced rate of photosynthesis, retarded growth. UV damages nucleic acids leading to more number of mutations. Minimizing the burning of fossil fuels, replacing CFC with substitutes & ban on CFC emitting materials, reducing rocket firing activities are certain measures to control ozone depletion.

Q3. Discuss briefly i) Radio-active wastes. ii) Defunct ships and e-wastes iii) Municipal solid wastes.

A. Radioactive wastes are the products of nuclear power stations or weapons which emit radioactive particles. Low level radiation wastes have low level radioactivity. These are produced in the laboratory while using radioactive isotopes, radiotherapy etc. High level radioactive wastes are destructive and are produced from the atomic reactors. These pollutants are highly dangerous and the wastes need to be buried deeper into the earth.

Defunct ships are the worn out and damaged, sunken ships or vessels that need to be dismantled as scrap. They are also hazardous to the health as they contain asbestos, mercury, lead etc.

E-wastes are the electronic wastes that are not useful anymore to the computer and need to be recycled as they contain copper, iron, silicon, gold, and cause hazard to the health of organisms.

Municipal solid wastes are the debris generated from human habitation, offices, schools, colleges, hospitals and other public utility buildings. The waste may include unused food, spoiled food, medicines, waste clothes, garbage, garden waste, dust, used furnitures, old appliances, news papers, plastics, bottles, broken objects, metallic goods, bandages, syringes, urine, stool, blood, worn and torn foot wares etc. all these wastes need to be segregated and disposed either by natural composting, vermicomposting, dumping in the dumping yard or burning into ashes.

PLEASE