

Chapter 16

Environmental Issues

1. What is the density of air between the plates of an electrostatic

1. PM_{2.5} is responsible for causing greatest harm to human health. What is it? How is it harmful?

Ans. PM_{2.5} stands for particulate matter of size 2.5 micrometers or less in diameter. Its responsible for causing greatest harm to human health as it can be inhaled deep into lungs and cause breathing problems.

3. What is the noise level that can cause permanent impairment of hearing ability of human beings?

Ans. 150 dB or more

4. Why was the Montreal Protocol signed?

Ans. To control emission of ozone depleting substances.

5. Jhum cultivation has been in practice from earlier days, but its considered more problematic these days. Why?

Ans. Enough time gap is not being given for the natural process of recovery of land from the effect of cultivation.

6. A radiation causes ageing of skin, skin cancer , and inflammation of cornea called snow blindness. It also damages DNA. Name the radiation.

Ans. Ultraviolet B rays (UV-B rays)

7. Name any three gases contributing to green-house effect.

Ans. Carbon dioxide, methane & chlorofluorocarbons.

8. Name any two metals found in the catalytic converts?

Ans. Platinum, rhodium.

9. What is meant by ozone hole?

Ans. The decline in this thickness of spring time ozone layer is called ozone hole.

10. Define polar Vortex?

Ans. Polar vortex refers to the natural circulation of wind that completely isolates the Antarctic air from rest of world.

11. Name the method used to remove pollutant gases from exhaust?

Ans. Scrubber.

12. Why CNG is considered a better fuel than diesel for automobiles?

Ans. Because CNG is a renewable fuel & makes less pollution.

13. Which types of uv-radiations are lethal to organisms?

Ans. UV-B

14. What is meant by snow blindness?

Ans. The inflammation of cornea caused by a high dose of UV-B is known as snow blindness.

15. Why should unleaded petrol be used in automobiles with catalytic converter?

Ans. Unleaded petrol is used in automobiles with catalytic converter because lead may deactivate the catalyst present in converter.

16. Name the most widely used method of removing particulate matter?

Ans. Electrostatic precipitator.

17. What is the expected rise in the global temperature by the year 2010?

Ans. Global temperature may increase by 1.4-5.8°C by 2010.

2 Marks Questions

1. Landfills are not much a solution for getting rid of solid wastes. Why?

Ans. Landfill sites are getting filled very fast due to large amount of garbage generation. Also underground water resources may get polluted due to seepage of chemicals.

2. Electrostatic precipitator can remove over 99% particulate matter present in exhaust from a thermal power plant. How?

Ans. Electrode wire at thousand volts, produce corona to release electrons, electrons attach to dust particles giving them net negative charge, charged dust particles attracted/collected by collecting plates which are grounded.

3. Why is a scrubber used? Which spray is used on exhaust gases passing through a scrubber?

Ans. To remove gases like sulphur dioxide. Spray of water or lime is used.

4. There is a sharp decline in dissolved oxygen downstream from the point of sewage discharge. Why? What are its adverse effects?

Ans. Following discharge of sewage into river, micro organisms involved in biodegradation of organic matter present in sewage consume more oxygen. This cause mortality of fish and other aquatic creatures.

5. Catalytic converters use expensive metals as catalysts.

(a) Name the metals generally used.

(b) What precaution should be observed while using catalytic converter.

Ans. (a) Catalysts : platinum – palladium and Rhodium

(b) Motor vehicles equipped with catalytic converters should use unleaded petrol as lead inactivates the catalysts.

6. What are e-wastes? Why are they creating more problem in developing countries in comparison to developed countries?

Ans.(a) Irreparable computers and other electronic wastes.

(b) Recycling in developing countries involves manual participation thus exposing workers to toxic substances. In developed countries its mechanised so less dangerous.

7. Water logging and salinity are some of the problems that have come in the wake of Green revolution. How does water logging create problems of salinity?

Ans. Water logging draws salt to surface of soil. Salt deposited on land surface as a thin crust or at the roots of the plants

8. What is the relationship between BOD, micro-organisms and amount of bio degradable matter?

Ans. Increase in amount of biodegradable matter leads to rapid multiplication of micro organisms to degrade it, thereby increasing BOD level of the water body.

9.What are algal blooms? How do they affect the other organisms in the water body?

Ans. The decline in this thickness of spring time ozone layer is called ozone hole.

10.How do CFCS cause damage to ozone layer?

Ans. Chlorofluorocarbon (CFCS) breaks into active chlorine in the presence of uv. The Cl atom degrade ozone into molecular oxygen which causes depletion of ozone layer.

11.What initiatives were taken for reducing vehicular are pollution in Delhi?

Ans. In Delhi, the following initiatives have been taken for reducing vehicular air pollution:-

- i)Use of unleaded petrol.
- ii)Use of low sculpture petrol & diesel.
- iii)Use of catalytic converters in vehicles.
- iv)Use of Euro – II grade engines in vehicles.
- v)Use of CNG in place of diesel in buses & autos.

12.What are e-wastes? How can they be getting rid off?

Ans. E-wastes are damaged electronic item or electronic parts. These are generated in developed countries & are sent to developing countries where certain metals like gold, nickel silicon, copper etc. are recovered from them e-wastes are buried as landfill or incinerated.

13. Mention any four consequences of deforestation?

Ans. i) Carbon dioxide concentration of the atmosphere has increased.
ii) There is a loss of biodiversity due to habitat destruction.
iii) Deforestation disturbs hydrological cycle.
iv) There is soil erosion & it may lead to desertification in extreme cases.

14. Why are the radioactive wastes stored in small ponds within the premises of nuclear power plant before they are finally disposed?

Ans. Radioactive wastes are first concentrated to reduce the volume & then for 50-100 years in small ponds within the premises of nuclear power plants during which time there is considerable decay of radioactivity & lessening of heat. Subsequently they are stored in suitably containers & buried within rocks about 500m deep inside the earth.

15. Why do certain organisms disappear after a certain distance in water body?

Ans. Since domestic sewage mainly contains biodegradable wastes they are decomposed by microorganisms; the decomposer use oxygen of the water body & hence many aquatic organism die due to lack of oxygen but after a certain distance in water body where nutrient availability is more certain microorganisms reappears.

16. What is photochemical smog composed of? How does this affect the plants?

Ans. Combustion of petrol & diesel releases carbon monoxide nitrogen oxide, hydrocarbons etc. Many of the products of incomplete combustion of petrol & diesel undergo photochemical reaction with oxides of nitrogen to generate photochemical smog. It causes toxic effects on plants e.g. premature death, reduced growth and yield.

17. What can be the effect of discharging hot water into water body on the organism in it?

Ans. Thermal waste water flowing out from thermal power plants eliminates or reduces many organisms that are sensitive to high temperature but it may enhance the growth of plants & fish in extremely cold areas.

18. How defunct ships contribute to solid wastes?

Ans. Defunct ships contribute to solid wastes. In India & other developing countries, these ships are broken down for scrap metal. The body of these ships contains toxic materials like asbestos, tri butyltin, mercury, lead, etc. These chemicals are very harmful for worker. It also pollutes coastal areas in vicinity of ship breaking yard.

3 Marks Questions

1. Deforestation is creating a lot of problems in the environment. List the consequences of deforestation.

Ans.

- Enhanced CO₂ concentration in atmosphere
- Loss of biodiversity
- Soil erosion
- Desertification
- Disturbed hydrological cycles.

2. Enlist four harmful effects caused to the humans living in areas having polluted air. Suggest two measures to reduce air pollution.

Ans. Breathing problems, irritation and inflammation, Damage to lungs, Premature death.

- Reduce emission from automobile exhaust
- Growing more trees.

3. People have been actively participating in the efforts for the conservation of forests.

(i) Name the award instituted in respect of Amrita Devi to promote such efforts.

(ii) Name the movement launched to protect the trees by hugging them.

(iii) Name the step Government of India has undertaken in 1980's to work closely with the local communities for protecting and managing forests.

Ans. (i) Amrita Devi Bishnoi Wildlife Protection Award.

(ii) Chipko movement

(iii) Joint Forest Management (JFM).

4. What is biological magnification? Explain how DDT as a water pollutant undergoes biological magnification?

Ans. Insecticide & herbicide are very harmful; they destroy the larval stage of aquatic animals. These substances also reduce the photosynthetic activity of phytoplankton & algae.

Through the food chain, they accumulate in the body of carnivores in more high concentration & produce fatal effects, so large number of fishes are found dead in areas polluted with DDT shows the biological magnification or bio-concentration of DDT through an aquatic food chain. Thus, Biological magnification is the phenomenon in which harmful chemicals/pollutants get accumulated in the tissues of organisms in increasing concentration, as they travel along the food chain.

5. Discuss briefly the catalytic converter?

Ans. Catalytic converters are used in automobiles for reducing of harmful gases. They have expensive metals like platinum, palladium, rhodium as catalysts. As the exhaust passes through catalytic converter, unburnt hydro-carbons are converted into carbon-dioxide & water; carbon monoxide & nitric oxide are changed into carbon dioxide & nitrogen gas respectively. Vehicles fitted with catalytic converter should use unleaded petrol as leaded petrol inactivates the catalyst.

6. With the help of a diagram describe the working of an electrostatic precipitator?

Ans. It is the most widely used method for removal of particulate matter. About 99% of particulate matter is removed from exhaust of thermal power plant. It has electrode wires & a stage of collecting plates. The collecting wires are maintained at several thousand volts which produces corona that releases electrons. These electrons get attached to dust particle & give them a net negative charge. These charged particles are attracted by collecting plates. The velocity of air must be low enough to allow particles to fall on them.

7. What is deforestation? Mention some of its causes & also the measures taken to prevent deforestation?

Ans. The cutting down of forests to fulfil demands of ever increasing population is known as deforestation. The major causes of deforestation include:-

- i) Indiscriminate felling :- Overuse of forest resources by cutting trees to fulfil demand of fuel wood, household articles.
- ii) Overgrazing :- by wild as well as domestic animals due to which soil is exposed to direct action of wind, water, sun.
- iii) Conversion of forest area into industrial area:- acc. to population, man is trying to convert forest land into cultivable land to meet his demand.
- iv) Shifting Cultivation:- due to continuous & repeated cropping the become unsuitable for cultivation.
- v) Developmental projects:- e.g. dams, buildings, hydroelectric projects, railway lines, roads etc. Forests can be conserved by any of the following ways:-
 - a) Afforestation & reforestation.
 - b) Protection from fire
 - c) Protection from grazing
 - d) Protection from insects & pests
 - e) Protection from human interference.

8. What is Green house effect? Discuss the various impacts of greenhouse effect on environment?

Ans. Under normal conditions & concentration of CO₂, the temperature of earth surface

is maintained by energy balance of sun that strike the planet & heat is radiated back into outer space. However, when concentration of CO₂ in atmosphere increases, it prevents the heat from being re-radiated out. The heated earth can re-radiate this absorbed energy as the radiations of longer wavelength. This sort of phenomena known as Green house effect impact of Green house effect:-

i) Change in weather & climatic condition :- The mean temperature of earth has increased by 0.60 c during last century. When environment heats up, its moisture carrying capacity increases. It will result in drastic changes in rainfall pattern. As a result , floods & drought increases thereby causing health hazards.

ii) Rise in Sea level:- The gradual increase in green house effect will lead to serious consequences e.g. melting of glaciers & polar ice-caps.

iii) Decrease in forest cover:- The drastic decrease in forest cover will create a layer of impenetrable gases on the surface of earth atmosphere converting planet into blast furnace.

iv) Effect on Agriculture :- The changes of depletion of character & productivity of soil is associated with global warming.

9.What is Eutrophication? Explain its consequences on the life of plants & animals living in such water?

Ans. Eutrophication means natural ageing of lake by nutrient enrichment of its water. In a young lake water is cold & clear, supporting little life. With time streams draining into lake introduce nutrients e.g. nitrogen, phosphorus, which encourage the growth of aquatic organism. As the lake fertility increases, plant & animal life burgeons & organic remains begin to deposit on bottom of lake. Over centuries, as silt & organic debris pile up, lake grows shallower & warmer with warm water supplanting those thrive in cold environment Marsh plants take root in the shallows & begin to fill in original lake basin. Eventually, lake gives rise to large masses of floating plants finally converting into land. However, pollutants from man's activities can radically accelerate the ageing process. This phenomena has been called cultural or accelerated eutrophication.

10.Describe the different components that compose solid wastes?

Ans. Solid wastes refers to everything that goes out in trash. They are of following types:-

i) Municipal solid wastes:- wastes from homes, offices, schools etc, that are collected & disposed by the municipality & generally consist of paper, waste, food material, leather etc.

ii) Fly ash:- Thermal power plants generate fly ash which is composed of oxides of silica, iron & aluminium & low conc. of toxic heavy metals.

iii) Defunct ships:- Defunct ships are broken down in developing countries for scrap metals, they contain toxic substances like asbestos, PCB, lead, mercury etc.

iv) Hospital wastes:- Hospital produces many hazardous wastes that contains pathogenic microbes, disinfectant & other harmful chemicals.

v) Industrial wastes:- Industries involved in manufacture of paper, rubber, pesticide, dye etc produce large amount of corrosive & highly inflammable chemicals

vi) Electronic wastes:- E-wastes are generated in developed countries & sent in

developing countries where certain metals like Au, Ni, Si, Cu, Fe etc. are recovered from them but also produces toxic substances.

11. Discuss the various effects of Deforestation?

- Ans.** i) Destruction of Resources:- destruction of forests leads to decrease in availability of forest resources e.g. timber, firewood etc.
ii) Soil erosion:- The destruction of green cover results in loosening of soil & large scale erosion so agricultural production goes down.
iii) Heavy Siltation of Dams:- Large scale deforestation leads to increasing disastrous floods & soil erosion.
iv) Destruction of wildlife:- Deforestation destroys the habitat of animal species resulting depletion in wildlife & their gradual extinction.
v) Change in Microclimate:- destruction of forests decrease the availability of ground water resources & also result in decrease in average rainfall in a particular area.
vi) Desertification:- Destruction of forests & overgrazing of animals leads to formation of deserts.
vii) Environmental pollution:- CO₂ produced by burning of fossil fuels is used up to large extent by plants for photosynthesis.

5 Marks Questions

1. Pollutant released due to human activities (like effluents from industries and homes) can radically accelerate the ageing process of the water body .

(a) Explain how does this process occurs during natural ageing of lake.

(b) Give the term used for accelerated ageing of water bodies. Also give the term used for the natural ageing of lake.

Ans. (a) The phenomenon is eutrophication. More nutrients in water, aquatic life increases organic remains deposited on lake bottom, lake grows shallower and warmer, gradually transforms into land due to deposition of silt and organic debris.

(b) Cultural or Accelerated eutrophication Natural ageing is Eutrophication.

2. In Arcata, the town's people have created an integrated waste water treatment process within a natural system. A citizen group called FOAM helps in upkeep of this project.

(a) What are the main steps in waste water management done in this way?

(b) 'Ecosan' in Kerala and Sri Lanka is also an initiative for water conservation. How?

Ans. (a) Conventional sedimentation, filtering and chlorine treatment. Absorption and assimilation of pollutants by algae, fungi and bacteria.

(b) 'Ecosan' derived from ecological sanitation. Handling human excreta using dry composting toilets. Its practical, hygienic and cost effective method.

3. What are the contribution of Ahmed Khan in Bangalore and Ramesh Chandra Dagar in Sonipat?

Ans. Integrated organic farming is a cyclical, zero-waste procedure, where waste products from one process are cycled in as nutrients for other processes. This allows the maximum utilisation of resource and increases the efficiency of production. Ramesh Chandra Dagar, a farmer in Sonipat, Haryana, is doing just this. He includes bee-keeping, dairy management, water harvesting, composting and agriculture in a chain of processes, which support each other and allow an extremely economical and sustainable venture. There is no need to use chemical fertilisers for crops, as cattle excreta (dung) are used as manure. Crop waste is used to create compost, which can be used as a natural fertiliser or can be used to generate natural gas for satisfying the energy needs of the farm. Enthusiastic about spreading information and help on the practice of integrated organic farming, Dagar has created the Haryana Kisan Welfare Club, with a current membership of 5000 farmers.

4.i) What is meant by ozone shield?

ii) Name two ozone depleting substances?

iii) How do ozone depleting substances affect ozone shield?

iv) Write one damaging effect of ozone – depletion on human & plants respectively?

Ans.i) The ozone layer present in the atmosphere acts as an ultraviolet absorbent thus protecting the earth from its harmful effect. The upper layer of atmosphere enveloped by ozone is called ozone layer or ozone shield.

ii) Chlorofluorocarbon used in aerosol propellant, fire extinguisher, refrigeration etc.

iii) During depletion, the chlorine, fluorine, bromine, of CFCs & halogens are converted into reactive free radical form by photochemical reaction. Cl or F are free to react with ozone disintegrating it into $O_2 + O$



iv) In humans, it causes damage to DNA & mutations arise & also cause ageing of skin, damage to skin & skin cancer. In plants, it causes injury, premature death of plants & reduced growth & yield.