

Class: XI
Subject: Biology
Topic: Environmental issues
No. of Questions: 25

Q1. What are the various constituents of domestic sewage? Discuss the effects of sewage discharge on a river.

Sol. The domestic waste contains everything that goes down the drain into the sewer of the house. Suspended solids are soil particles (sand and silt), inorganic colloidal particles (e.g., clay) and organic colloidal matter (faecal matter, cloth, paper fibres, eatable waste etc.), dissolved solids (nitrates, phosphates etc. and toxic metal ions) and pathogens.

Pollutants make water unfit for domestic and industrial use.

Q2. List all the waste that you generate at home, school or during your trip to other places: could you very easily reduce? Which would be difficult or rather impossible to reduce?

Sol. Waste generated at home: paper, cloth, plastic, cans, boxes, wood, sewage, kitchen waste etc.

Waste generate at school: paper, chalk, plastic envelopes etc.

Waste generated during trips: Paper, disposable cups, plates, spoons, plastic envelopes, discarded food etc.

Yes, waste can easily be reduced by us through judicious use of materials, by changing our habits and life styles.

The waste belongs to two categories: Biodegradable and non-biodegradable. It is difficult or rather impossible to degrade non-biodegradable waste because microorganisms can not decompose these.

Q3. Why ozone hole forms over Antarctica? Who will enhanced ultraviolet radiation effect us?

Sol. Chlorofluorocarbons, mainly released in the atmosphere by developed countries, slowly enters the stratosphere and the winds move them towards the poles. Environmental condition prevailing in Antarctica during winter months (June to August) are conducive for the formation of ozone hole. In these month, there is no sunlight in Antarctica and extremely low temperature (-85°C) facilitates the formation of ice cloud. During winter, natural circulation of wind (polar vortex) completely isolates Antarctic air from the rest of the world. The ice clouds provide the catalytic surface for the reaction of chlorine atoms and then ozone. But this degradation of ozone occurs with the return of solar radiations to

Antarctica during spring (September and October). This results in the thinning of ozone layer every year most of Antarctica. This hole disappears in summer due to warming up of air and the mixing up of Antarctic air with that of the rest of the world.

Enhanced UV radiations on earth would affect humans and other animals by causing.

- (i) Skin cancer,
- (ii) Blindness and increased chances of cataract in eyes, and
- (iii) Malfunctioning of immune system.

Q4. Discuss the role of women and communication in protection and conservation of forests.

Sol. In 1731, a Bishnoi woman Amrita Devi showed exemplary courage by hugging a tree to prevent its cutting. Her three daughters and hundreds of other Bishnoi followed her. They were killed by soldiers of king of Jadhpur. This movement forced the king to abandon cutting of trees

Q5. What initiatives were taken for reducing vehicular air pollution in Delhi? Has air quality improved in Delhi?

Sol. Under the direction of Supreme Court of India, the state government of Delhi took following measures to improve the quality of air:

- (i) Switching over the entire fleet of public transport buses from diesel to CNG by the end of 2002.
- (ii) Phasing out of old vehicles,
- (iii) Use of unleaded petrol,
- (iv) Use of low sulphur petrol and diesel,
- (v) Use of catalytic converters in vehicles, and
- (vi) Application of Euro II norms for vehicles.

Q6. What is PAN?

Sol. Peroxyacyl nitrate.

Q7. What is eutrophication?

Sol. Increased productivity due to nutrient abundance.

Q8. Between amphibians and birds, which will be able to cope with global warming? Give reason.

Sol. Birds. It is so because they are homeotherms.

Q9. Why is the use of unleaded petrol recommended for motor vehicles equipped with catalytic converters?

Sol. Catalytic converters, having expensive metals namely platinum, palladium and rhodium as the catalysts, are fitted into automobiles for reducing emission of poisonous gases.

The exhaust passes through the catalytic converter and unburnt hydrocarbons are converted into carbon dioxide and nitrogen gas, respectively.

Motor vehicles equipped with catalytic converter should use unleaded petrol because lead in the petrol inactivates the catalyst

Q10. What is synergism?

Sol. Increased toxicity of secondary pollutants formed by interaction among the primary pollutants is called synergism.

Q11. What is pyrolysis?

Sol. Pyrolysis is burning without oxygen. It consumes a large amount of energy. It is a very costly means of disposing of the wastes.

Q12. Give advantages of CNG over petrol or diesel.

Sol.

- (i) CNG is better than petrol or diesel because it burns most efficiently and very little of it is left unburnt,
- (ii) It is cheaper than petrol or diesel,
- (iii) It cannot be siphoned off by thieves, and
- (iv) It cannot be adulterated like petrol or diesel.

Q13. DDT content in the lake water that supplies drinking water to nearby villages, is found to be 0.003 ppm. The king fishers of that area are reported to have 2 ppm of DDT. Why has the conc. increased in these birds? What harm will this cause to the bird population? Name the phenomenon.

Sol. DDT is a non-biodegradable pollutant. It gets biomagnified at different trophic levels. From water, it accumulates in phytoplanktons, then to fish and finally to predatory birds (king fishers). Higher conc. Of DDT disturbs calcium metabolism in birds resulting in thinning of egg shells, and their premature breaking. This phenomenon is called biomagnification.

Q14. Explain accelerated eutrophication. Mention any two consequences of this phenomenon.

Sol. Increased concentrations of phosphorus and nitrates from industries and residences etc. in water body act as nutrients and accelerate the growth of algae that may form a mat on the water surface. This increased productivity is called accelerated eutrophication.

Consequences.

- (i) Eutrophication leads to lowering of BOD in water body leading to death of aquatic life.
- (ii) Nitrates from fertilizer and detergents contaminate drinking water leading to decrease in oxygen carrying capacity of haemoglobin in human beings.

Q15. A crane had DDT level as 5 ppm in its body. What would happen to the population of such birds?

Sol. Increased conc. Of DDT in birds affects calcium metabolism in them. As a result, the egg shells become thin and break before maturity. It will result in decline in bird population.

Q16. During the secondary treatment of the primary effluent how does the significant decreases in BOD occur?

Sol. During secondary treatment, organic wastes (carbohydrates, lipids, proteins etc.) are degraded by the action of bacteria and protozoa which consume these biodegradable organic soluble contaminants and bind into less soluble fraction as floc. The floc settle down resulting in decrease in BOD.

Q17. Explain the cause of algal bloom in a water body. How does it affect an ecosystem?

Sol. Increased concentrations of phosphates and nitrates from industries, residential wastes as well as from agricultural run off water into the water bodies result in excessive growth of

algae which form a mat on the surface of water. This phenomenon is called algal bloom or eutrophication.

It affects the ecosystem in following ways:

- (i) It decreases light penetration thus affecting photosynthesis.
- (ii) It results in depletion of dissolved oxygen resulting in death of aquatic life.
- (iii) Nitrates contaminate drinking water leading to decrease in oxygen carrying capacity of haemoglobin in human beings.

Q18. Mention the major cause of air pollution in metro cities. Write any three ways by which it can be reduced.

Sol. Vehicular pollution and Industrial pollution.

Three ways to check it are-

- (i) Use of catalytic converters in vehicles.
- (ii) Use of CNG as an alternative to petrol/diesel.
- (iii) Application of Euro II norms for vehicles.

Q19. What is particulate matter? How do particulate matters harm human health?

Sol. The particulate matter consists of solid or liquid particles present in the air. These may be settleable particles (e.g., sand, water droplets) or suspended particles, (e.g., dust) or non-settleable particles (e.g. tobacco smoke).

Q20. What is photochemical smog? How does smog affect the biological world?

Sol. Photochemical smog is grey or yellowish brown, opaque smog formed at high temperature over cities and towns due to still air, emission of nitrogen oxides and volatile hydrocarbons from automobile exhausts and solar energy. It contains secondary pollutants. It is having oxidizing environment.

Q21. Which of the following is a greenhouse gas ?

- a) Methane
- b) Oxygen
- c) Nitrogen
- d) Hydrogen

Sol. (a)

Q22. _____ is used to convert organic pollutants into water vapour and CO₂.

- a) Electrostatic precipitator
- b) Flame combustion
- c) Absorption
- d) Wet-scrubber

Sol. (B)

Q23. _____ are used in electrostatic precipitators.

- a) Catalysts
- b) Absorbers
- c) Electrodes
- d) Chemicals

Sol. (c)

Q24. Biological oxygen demand of _____ is the least.

- a) sewage
- b) sea water
- c) pure water
- d) polluted water

Sol. (c)

Q25. Compounds of ____ cause Minamata disease.

- a) mercury
- b) cadmium
- c) cobalt
- d) fertilisers

Sol. (a)

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