13. Pollution of Air and Water

Objective Type Questions

1. Name the following:

(a) Carbon dioxide

(b) Sulphur dioxide; Nitrogen oxides

(c) Carbon monoxide, sulphur dioxide, nitrogen oxides, smoke and dust, etc.

(d) Carbon monoxide

(e) Carbon dioxide and Carbon monoxide

(f) Ozone

(g) Dysentery and jaundice

(h) Lead, arsenic, nickel and cadmium

(i) Nitrates and phosphates

(j) Oxygen

2. Match the items given in column I with one or more items given in column II:

(a) (iv)

(b) (v)

(c) (vi)

(d) (ii)

(e) (i)

(f) (iii)

Subjective Type Questions

Short Answer Type Questions

1. In 1985, an ambitious plan to cleanse the highly polluted river Ganga and save it was launched. It is called Ganga Action Plan. The aim of Ganga Action Plan is to reduce the pollution level in the water of river Ganga.

2. The major pollutants which cause water pollution are: Sewage, Fertilisers, Pesticides and Industrial wastes. Ways of controlling water pollution:

(i) Sewage should be treated properly at sewage treatment plants to make it harmless before discharging it into nearby rivers.

(ii) Farmers should use correct amounts of fertilisers and pesticides in the fields.

(iii) All the industries should treat the toxic wastes produced by them suitably to make them harmless before discharging them into rivers.

3. Almost all the industries produce toxic chemicals as their waste products. The untreated industrial wastes are discharged by the industries into the nearby rivers or lakes. In this way, the river water or lake water gets polluted with toxic chemicals.

4.We can help in reducing air pollution at the individual level by following the following measures:

(i) We should not burn dry leaves, papers and garbage in the open.

(ii) We should save electricity. This will lead to the burning of less coal to generate electricity. And burning of less coal will reduce air pollution.

(iii) We should grow more trees and also take care of the existing trees in our neighbourhood.

5. The mixture of gases containing nitrogen, oxygen, carbon dioxide, argon and water vapour gives us pure air which is good for us. In addition to the normal constituents, the polluted air may also contain harmful substances such as carbon monoxide, sulphur dioxide, nitrogen oxides, smoke and dust, etc.

6. The warming up of the earth's atmosphere due to the trapping of sun's heat rays by carbon dioxide gas in the atmosphere, is called greenhouse effect. The warming (or heating) of the earth produced by greenhouse effect is important for the existence of life on the earth.

7. Chlorofluorocarbons are depleting the useful ozone layer of the upper atmosphere. The destruction of ozone layer by CFCs will allow the extremely harmful ultraviolet radiations of the sun to reach the earth. These ultraviolet radiations can cause skin cancer, cataract, and destruction of plants, including crops.

8. (a)Sulphur dioxide:

Source - Sulphur dioxide is produced by the burning of coal in factories and thermal power plants.

Harm - Sulphur dioxide gas in the polluted air causes respiratory problems.

(b)Nitrogen oxides:

Source - Nitrogen oxides are produced by the burning of fuels like petrol and diesel in motor vehicles.
Harm - Nitrogen oxides attack breathing system and lead to lung congestion.

(c)Carbon monoxide:

Source - Carbon monoxide is produced by the incomplete combustion of fuels like wood, coal, kerosene, petrol and diesel in homes, factories and motor vehicles.

Harm - When inhaled, carbon monoxide combines with the haemoglobin of our blood and reduces the oxygen-carrying capacity of blood.

(d)Chlorofluorocarbons:

Source - Chlorofluorocarbons are used in refrigeration, air conditioning and aerosol sprays.

Harm - Chlorofluorocarbons are depleting the useful ozone layer of the upper atmosphere.

9. Hot water from power plants and industries is also considered a pollutant. This is because when very hot water coming from power plants and industries is discharged into a river or lake, it raises the temperature of the river water. This rise in the temperature of river water has an adverse effect on the animals and plants living in it.

10. The farmers use toxic chemicals called pesticides on standing crops in the fields to protect them from pests and diseases. Some of these pesticides dissolve in rain water and run into rivers, lakes and ponds and pollute their water. These poisonous pesticides kill the aquatic animals like fish.

11. (a) The experts have warned that air pollution around Taj Mahal area is discolouring its white marble and also corroding it slowly. This poses a threat to the beauty of Taj Mahal. Actually, the Mathura Oil Refinery near Agra as well as the various industries in and around Agra are emitting gaseous pollutants into the air which cause acid rain. The acids present in acid rain react with the marble of Taj Mahal monument and corrode it slowly.

(b) Some of the ways of controlling air pollution are given below:

(i) The air pollution can be controlled by using smokeless fuels like LPG, PNG and Bio-gas for cooking food.

(ii) The air pollution from motor vehicles can be reduced by using CNG as fuel in place of petrol and diesel.

12. (a) The water which is safe for drinking is called potable water. The various methods which can be used to make water potable are: (i) by filtering (ii) by boiling, and (iii) by chlorination.

(b) The various ways to conserve water at home are as follows:

(i) Turn off the tap immediately after use. Get the leaking taps repaired immediately.

(ii) Brush your teeth by filling water in a mug.

Long Answer Type Questions

1. (a) The contamination of water of rivers, lakes and ponds, etc., with unwanted and harmful substances is called water pollution. The major sources of water pollution are:

(i) Dumping of untreated sewage into rivers causes water pollution.

(ii) Use of fertilisers in agriculture causes water pollution.

(iii) Use of pesticides in agriculture causes water pollution.

(iv) Discharging of untreated industrial wastes into rivers and lakes causes water pollution.

(b) The various harmful effects of water pollution are as follows:

(i) Drinking of water polluted with untreated sewage can cause diseases.

(ii) Water of rivers and lakes polluted with fertilisers can cause the death of aquatic animals.

(iii) Water of rivers and lakes polluted with pesticides can kill aquatic animals and also damage our health.

(iv) Water of rivers and lakes polluted with toxic industrial wastes kills the aquatic animals, damages our nervous system and causes diseases such as blood poisoning and cancer.

2. (a) Air is a mixture of gases. Nitrogen makes up about 78 per cent of air whereas oxygen makes up about 21 percent of air by volume. Air also contains small amounts of carbon dioxide, argon and water vapour, etc.

(b) The contamination of air with harmful gases, smoke and dust, etc., is called air pollution. The major pollutants which cause air pollution are: Sulphur dioxide, Nitrogen oxides, Carbon monoxide, excess of Carbon dioxide, Chlorofluorocarbons, and Suspended particulate matter.

3. Smog is a deadly air pollutant which is formed by the combination of smoke and fog. Smoke contains tiny carbon particles, and harmful gases such as nitrogen oxides and sulphur dioxide, etc. The carbon particles, nitrogen oxides and sulphur dioxide, etc., of smoke combine with the condensed water vapour called fog to form 'smog'. Smog causes cough and aggravates asthma and other lung diseases, especially in children.

4. Acid rain is that rain which contains small amounts of acids formed from acidic gases like sulphur dioxide and nitrogen oxides present in polluted air. Pollutants like sulphur dioxide and nitrogen oxides present in the polluted air reacts with the water vapours in atmosphere to form sulphuric acid and nitric acid. These acid dissolves in rainwater and fall on the Earth in the form of acid rain. Acid rain has the following harmful effects:

(i) Acid Rain Destroys Forests. Acid rain damages the forest trees by destroying their leaves. It causes the leaves of trees to turn yellow and fall off.

(ii) Acid Rain Kills Aquatic Animals Such as Fish. Acid rain causes the water in ponds, lakes and rivers to become much more acidic and unsuitable for the survival of aquatic animals and plants.

(iii) Acid Rain Corrodes the Statues, Buildings and Historical Monuments and Damages Them Slowly. The acids present in acid rain react with the carbonates present in marble and limestone of a statue, building or monument and corrode it slowly.

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5. The undue rise in the temperature of earth's atmosphere due to excessive greenhouse effect produced by increasing amounts of carbon dioxide gas in the atmosphere is called global warming. Global warming is harmful to us in the following ways:

(i) Global Warming Can Cause Sea-Levels to Rise Dramatically. This will happen as follows: The rise in temperature of atmosphere due to excessive greenhouse effect or global warming will melt the enormous amount of ice lying on the poles of the earth. The huge amount of water produced by the melting of polar ice will raise the level of water in seas and oceans, and flood the low-lying areas of the earth.

(ii) Global Warming Can Reduce Rainfall in Some Areas of the Earth Leading to Droughts. This can cause the death of many plants and animals, and turn large areas of the earth into semi-deserts.