CHAPTER 13

Environment and its Pollution

Air

- Composition of air is nitrogen 78.084%, oxygen 20.946%, argon 0.934%, carbon dioxide 0.033%.
- Region of air present around the earth is called atmosphere.
- Main layers from the surface of earth upwards
  (a) Troposphere (b) Stratosphere
  (c) Mesosphere (d) Thermosphere
- Most of atmospheric air is present in troposphere.
- Ozone layer present in the stratosphere region (at a height of 32.50 km) protects the living beings from harmful UV radiation coming from the sun.
- In 1775 French Scientist Lavoisier performed experiments on composition of air.

Air Pollution

- It is due to the presence of foreign substances in air. Main air pollutants are SO_2, CO, nitogen oxides, particualates etc.

Smog

(a) **Classical smog** It is also called London type smog. It is formed in cool humid climate and is reducing in nature.

(b) **Photochemical smog** It is also called Los Angeles smog. It is formed in day time and is oxidising in nature.

Diseases Caused by Particulars

Disease	Cause
Pneumoconiosis	Coal dust
Silicosis	Silica (from ceramics, glass and pottery industry)
Black lung disease	Coal mines
White lung disease	Textile industries
Asbestosis	Asbestos
Byssinosis	Cotton fibre dust

Green House Effect

- It is the heating up of earth and its objects due to trapping of outgoing IR radiations by green house gases like CO_2, CH_4, NO, O_3, chlorofluorocarbon and water vapours.

Global Warming

- It is due to increased concentration of green house gases.
- It may lead to melting of ice caps and glaciers, spreading of several infectious diseases like malaria, sleeping sickness etc.

Acid Rain

- The pH of normal rain water is 5.6 due to the dissolution of carbon dioxide from the atmosphere.
- When the pH of rain water is below 5, it is called acid rain (by Robert Augus).
- Acid rain damages the marble buildings (Taj Mahal) and monuments, corrodes metal pipes and results in several diseases.
- The main cause of acid rain is oxides of sulphur and nitrogen (H_2SO_4 and HNO_3).

Water Pollution

- Cholera, dysentery, typhoid etc, are water borne diseases caused by bacteria.
- Mercury causes Minimata disease, chromium and arsenic cause cancer and cadmium causes *itai-itai* disease.
- The usual effect of agricultural run off (due to the presence of nitrates and phosphates) is excessive algal growth in affected water bodies. It is called eutrophication.
- For clean water DO is 5-6 and BOD (biochemical oxygen demand) is less than 5 ppm.

Exercise

1. One of the occupational health hazards commonly faced by the workers of ceramics, pottery and glass industry is **(CDS 2011 II)**
   (a) stone formation in gall bladder
   (b) melanoma
   (c) silicosis
   (d) stone formation in kidney

2. During day time plants absorb
   (a) O_2 (b) CO_2
   (c) N_2 (d) CO

3. Amount of N_2 in air is
   (a) 50% (b) 10%
   (c) 25% (d) 80%

4. How much amount of sun rays reaching the earth is used by plants?
   (a) 90% (b) 1%
   (c) 15% (d) 48%

5. Which of the following compounds caused tragedy of Bhopal in 1984?
   (a) Phosphene
   (b) Methyl isocyanate
   (c) Carbon monoxide
   (d) Methyl cyanate

6. From which one among the following water sources, the water is likely to be contaminated with fluoride? **(CDS 2011 II)**
   (a) Ground water (b) River water
   (c) Pond water (d) Rain water

7. Which one of the following chemicals is commonly used by farmers to destroy weeds? **(CDS 2010 I)**
   (a) DOT (b) Malathion
   (c) Methyl bromide (d) 2,4-D

8. Which one of the following is associated with the formation of brown air in traffic congested cities? **(CDS 2009 I)**
   (a) Sulphur dioxide (b) Nitrogen oxide
   (c) Carbon dioxide (d) Carbon monoxide

9. Which one of the following is the major cause of depletion of ozone strata of the atmosphere?
   (a) Carbon dioxide (b) Chlorofluoro carbon
   (c) Sulphur dioxide (d) Nitrogen oxide

10. Green house effect is due to
    (a) oxygen (b) carbon dioxide
    (c) ozone (d) argon

11. Which of the following gases is not found free in air ?
    (a) Nitrogen (b) Carbon monoxide
    (c) Hydrogen (d) Oxygen

12. Freon' used as refrigerants is chemically known as **(CDS 2007 I)**
    (a) chlorinated hydrocarbon
    (b) fluorinated hydrocarbon
    (c) chlorofluoro hydrocarbon
    (d) fluorinated aromatic compound

13. The presence of which one of the following in the atmosphere causes acid rain?
    (a) Oxides of lead (b) Oxides of carbon
    (c) Oxides of sulphur (d) Hydrocarbons

14. Ordinary dry dry air consists of the following.
    I. Nitrogen II. Argon
    III. Oxygen IV. Carbon dioxide
    What is the decreasing sequence of these in percentages?
    (a) I, III, II and IV (b) I, II, IV and III
    (c) II, I, III and IV (d) II, I, IV and III

Answers

1. (c) 2. (b) 3. (d) 4. (b) 5. (b) 6. (b) 7. (d) 8. (b) 9. (b) 10. (b)
11. (c) 12. (c) 13. (c) 14. (a)

Hints and Solutions

1. Silicosis (Silico tuberculosis) occurs in workers whose occupation is relasted pottery, ceramic, and glass industry. The cause of disease is inhalation of free silica or silicon dioxide for a long time.

6. River water is polluted by industrial wastes which contain fluoride in large quantity. Hence, river water is likely to be contaminated with fluoride.

7. 2,4 D (2,4-dichlorophenoxy acetic acid) is used as a weedicide.

8. Nitrogen dioxide (NO_2) is a reddish brown gas. It has pungent smell and considered as air pollutant. Hence, nitrogen oxide is associated with the formation of brown air in traffic congested cities.

12. Chlorofluoro carbon (CF_2Cl_2) is also known as freon. It is used as refrigerants in refrigerators and air conditions. It is also used as a propellant in aerosols and foams.