Preventive Measures

Exercises

I. Short Answer Questions.

Question 1.
State two negative effects of vehicular emissions.
Answer:
Vehicular emissions have two negative effects on the environment : One is global climate change and the other is air pollution and its negative health repercussions.

Question 2.
Name any two gases emitted by vehicular emissions.
Answer:
Carbon monoxide (CO) and a large share of the hydrocarbonx (HC), nitrogen oxides (NO_x).

Question 3.
What is meant by carpooling ?
Answer:
Carpooling refers to the sharing of car journeys by persons travelling on the same route.

Question 4.
Name any three modes of public transport used in India.
Answer:
Buses, trams, passenger trains and metro rails.

Question 5.
What is a 'No Smoking Zone' ?
Answer:
Smoking does not just harm the smoker but also the people nearby, who breathe in the smoke exhaled by the smokers and are called 'passive smokers'. Recent research has shown that concentration of second-hand tobacoo smoke (the smoke exhaled by smoekers) in many outdoor areas is often as high or higher than in some indoor areas and the risks posed by such outdoor exposure are well beyond generally ecceptd norms when large numbers of people are involuntarily exposed. Therefore, the passive smokers or those who unavoidably breathe in second-hand tabacoo at public places have such as lung cancer, asthma, bronchitis and sudden infant death syndrome in children.
To save such passive smokers and discourage smokers from the ill effect of the smoking in public places 'No Smoking Zone' has been created.

Question 6.
What are Fossil Fuels ?
Answer:
Fossil fuels refer to buried, combustible deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal and natural gas by exposure to heat and pressure in the earth's crust over hundreds of millions of years.

Question 7.
State why should we use fossil fuels judiciously.
Answer:
Fossil fuels are non-renewable source of energy. As a result of growing demand fossil fuels are being depleted at a rate of 100,000 times faster than they are being formed. At the present rate of usage, the coal reserves are likely to last for about 200 years. Similarly, at the present rate of usage, the world's crude oil reserves would be exhausted in just 50 years. These resources are non-renewable and take millions of years to form. It is essential, therefore, to reduce dependence on such energy resources and explore and exploit the enormous potential of alternative sources of energy like solar energy, tidal energy, wind energy, geothermal energy and biomass based energy. They are not only renewable sources of energy but are environmentally clean and safe to use.

Question 8.
State any three measures to save energy.
Answer:

1. Use extra blankets and sweaters instead of using room heaters. Likewise, in summer, dress in light, cotton clothes to save on air conditioning costs and energy.
2. Make sure that the houses are well insulated and, if heated or cooled, windows or doors are not left open. Raise shades on winter days, lower them in the summer. Seal all leaks. Block windows and doors with weather-strip tape and install blinds to reduce outside heat transfer.
3. Use a low-flow shower head, to reduce water consumption and energy usage to heat the water.

Question 9.
What is Organic Farming ?
Answer:
According to Food and Agricultural Organisation (FAO) "Organic agriculture is a unique production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity, and this is accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs".

II. Long Answer Questions :

Question 1.
With reference to vehicular pollution in cities, state the significance of the following as a preventive measure.

1. Carpool
2. Public Transportation

Answer:

1. **Carpool :**
   (a) It reduces air pollution by reducing the number of vehicles on the road and thereby, cutting down the vehicular emissions.
   (b) It helps to save money in buying fuel and maintenance cost of cars.
   (c) It helps to save petrol and diesel and thereby, save foreign exchange that goes into buying these fuels.
   (d) It reduces traffic congestion on the roads and thereby prevents traffic jams, reduces fuel consumption and commuting time and the cost of road repairs.
   (e) It helps to use commuting time in useful pursuits.
2. **Public Transportation :**
   (a) It reduces damage to the environment by reducing emissions. For example, one bus emits far fewer fumes than 20 cars.
   (b) It requires 1/5 th energy per passenger per km compared to road based transport system. It therefore, reduces fuel consumption and thus helps to save foreign exchange used in buying petrol and diesel.
   (c) It causes less noise, no air pollution and is eco-friendly transport system.
   (d) It helps to save money spent on maintenance of personal vehicles. It avoids the need to find parking space for private vehicles. Thus, reduces congenstion on roads.

Question 2.
With reference to smoking, answer the following :

1. How does smoking harm passive smokers ?
2. Name any two legal provision meant to deter smoking.
3. State any three advantages of having a 'No Smoking Zone'.

Answer:

1. Smoking does not just harm the smoker but also the people nearby, who breathe in the smoke exhaled by the smokers and are called passive smokers. Recent research has shown that concentration of second hand tobacco smoke in many outdoor areas is often as high or higher than in some indoor areas such outdoor

exposure are well beyond generally are involuntarily exposed. Therefore, the passive smokers or those who unavoidably breathe in second-hand tobacco at public places have such as lung cancer, asthma, bronchitis and sudden infant death syndrome in children.

2. **(a)** As a preventive measure, a mandatory specific statutory health warning on cigarette packs was introduced in 1975. Realising the seriousness of the problem.
   (b) Smoking in public places was prohibited nationwide from October 2 under the Prohibition of smoking in Public Places Rules 2008. The smoking ban pertains to public places, which include auditoriums, cinemas, hospitals, public transport (aircraft, buses, trains, metros, taxis) and their related facilities (airports, bus stands, railway stations), restaurants, hotels, bars, pubs, amusement centers, offices, libraries, courts, post offices, markets, shopping malls, canteens, educational institutions and parks.
3. Advantages of No Smoking Zone are the following :
   (a) It reduces the possibility of second-hand tobacco smoke being inhaled by non-smokers.
   (b) It reduces air pollution. Areas which have prohibited smoking have been found to have better indoor air quality as opposed to areas where smoking is allowed.
   (c) It reduces healthcare costs by reducing the chances of diseases caused by smoking.
   (d) It reduces the chances of influencing others, especially the youth, to take on the habit of smoking.

Question 3.
With reference to Organic Farming state the following :

1. Four principles of Organic Farming.
2. Main characteristics of Organic Farming.
3. Importance of Organic Farming.

Answer:

1. **The four Principles of Organic Farming are :**
   (a) Organic should sustain and enhance the health of soil, plants, animals and humans as one and indivisible.
   (b) Organic farming should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
   (c) Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
   (d) Organic farming should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment.
2. **The main characteristics of organic farming are the following :**
   (a) Protecting the long term fertility of soils by maintaining organic matter levels, and creating optimized conditions for biological activity within the soil.
   (b) Providing crop nutrients indirectly using relatively insoluble nutrient sources

which are made available to the plant by the action of soil micro-organisms.
(c) Maintaining nitrogen self-sufficiency through the use of legumes and biological nitrogen fixation, as well as effective recycling of organic materials including crop residues and livestock manures.
(d) Preventing weeds, disease and pests by relying primarily on crop rotations, natural predators, diversity, organic manuring, resistant varieties and limited (preferably minimal) thermal, biological and chemical intervention.
(e) Providing attentive care and management of livestock, paying full regard to their evolutionary adaptations, behavioural needs and animal welfare issues, with respect to nutrition, housing, health, breeding and rearing.
(f) Careful attention to the impact of the farming system on the wider environment and the conservation of wildlife and natural habitats.

3. **Importance of Organic Farming are the following :**
   (a) Organic faming promotes the use of crop rotations and cover crops, and encourages balanced host/predator relationships.
   (b) Organic residues and nutrients produced on the farm are recycled back to the soil. Cover crops and composted manure are used to maintain soil organic matter and fertility.
   (c) Preventative insect and disease control methods are practiced, including crop rotation, improved genetics and resistant varieties. Integrated pest and weed management, and soil conservation systems are valuable tools on an organic farm.

Practice Questions

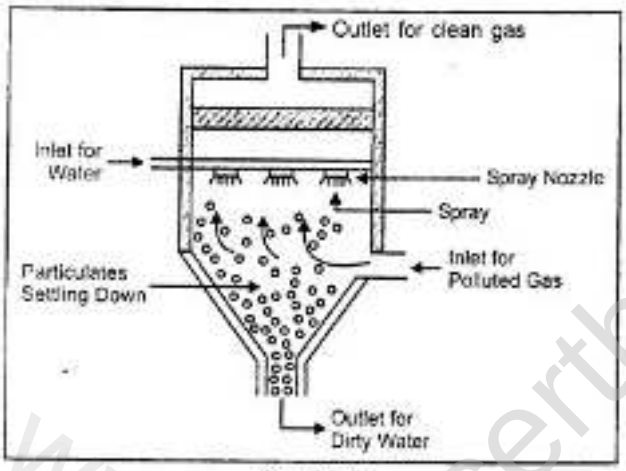
Question 1.
What purpose does an electrostatic precipitator serve?
Answer:
It is a device which removes unwanted chemicals from smoke after combustion takes place. The negative charged dust particles are drawn towards positively charged particles collector surface and by knocking the plates particles fall into a hopper tray for disposal.

Question 2.
In the context of reducing air pollutions, give the advantages of changing the process ; maintaining and modifying existing equipment.
Answer:
Change of modify the process of production in order to lower the atmospheric pollutants for example :

1. The coal is washed before crushing it to reduce the fly ash emissions.
2. The process of absorption can be used to remove gaseous air pollutants. In this process, gaseous air pollutants are removed by dissolution into a liquid solvent like water or caustic or acid solution. Absorption is used to remove sulphur dioxide, chlorine, ammonia, nitrogen oxides and hydrocarbons.

3. The process of absorption can be used to remove pollutants from waste water. In this process the target pollutants are made to attach to the surface of activated carbon. This is done by producing carbon through combustion of coal, coconut shells, wood and other organic materials. This carbon is then reacted with steam or carbon dioxide to produce activated carbon. Adsorption helps to remove pollutants as well as bad tastes and odours from drinking water.

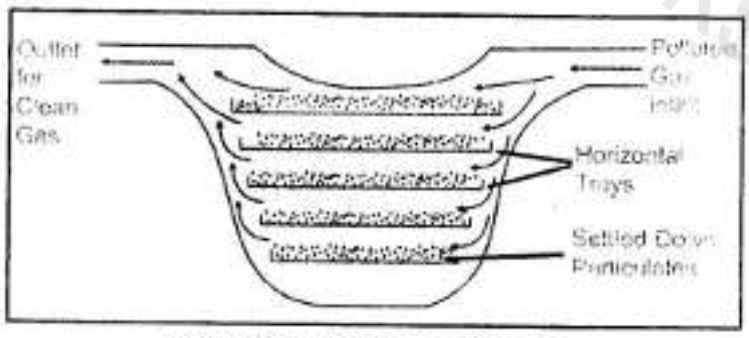
Question 3.
What is a scrubber ? With the help of a diagram show its working?
Answer:
It is a device that employs spray of water to catch pollutants



Scrubber

during emissions. In this process, water is introduced into a spray tower by means of a spray nozzle which allow downward flow of water. As the polluted gas flows upwards, the particulates present in the gas collide with the water droplets being sprayed from the spray nozzles. Under the influence of gravitational force, the liquid droplets containing the particulates settle at the bottom.

Question 4.
Describe with the help of a diagram, working of the settling chamber.
Answer:



Gravitational Settling Chamber

This device consists of huge rectangular chamber with several . horizontal trays. The gas stream polluted with particulates is allowed to enter from one end. The horizontal velocity of the gas stream is kept low in order to give sufficient time for the particles to settle by gravity. The particulates having high density settle at the bottom of the chamber from where they are removed.

Question 5.
What care should be taken in order to reduce water pollution from non-point sources ?
Answer:
Non-point sources of pollution are the outside sources which affect a large area, e.g. run-off from agricultural fields and deforested areas. Run-off of manure should be diverted to the dry fields, there should be separate drainage for sewage to divert it with rainwater. Natural manure should be used and pest management system should be established for pest control to reduce the use of pesticides.

Question 6.
Briefly state the procedure of treating waste water by primary and secondary treatment. What happens in the tertiary treatment of waste water ?
Answer:
In primary treatment the run-off should be drained through screens, grit chambers and sedimentation tanks to remove toxic chemicals from the water.
In secondary treatment the waste water the primary treatment is brought into contact with sludge heavily laden with micro-organisms. Afterwards the air is passed to give oxygen to the micro-organisms which convert the organic matter into low – energy compounds. The sludge material settles down in the tank and the clean water can be used after treating with chlorine gas.
After primary and secondary treatments, pollutants such as phosphorus and nitrogen are removed, so that the water may be harmless to human health. It is called 'Advanced Waste Treatment'.

Question 7.
Why is open dumping of solid waste not advisable ? What is done while segregating solid waste ?
Answer:
Open solid waste may pollute directly the air, besides this by washing with rainwater run-off it may pollute a large area and cause soil and water pollution. On the other hand the closed compost system of solid waste may provide good manure. Moisture control is done and micro-organisms help to stabilize the organic matter. First the fungi starts to work and at last actinomycetes break down the waste and convert it to humus known as compost making a good fertilizer.

Question 8.
"Better safe than sorry" is the guiding principle for control of Nuclear pollution. In this context answer the following :

- Explain-the three principles of radiation protection.

Answer:
These are :

1. keeping a distance from source of radiation
2. avoiding length of time of exposure
3. shielding the particular object and human body from the direct radiation.

- What should one do to protect oneself from radiation contamination ?

Answer:
Radioactive particles should not be inhaled by using air filters, using exhaust system is another method, wearing protective clothing prohibiting smoking are essential. Leakage of radioactive elements from nuclear reactors and plants should be checked regularly.

- How should the radioactive waste be stored and disposed of?

Answer:
Ans. Radioactive waste should be stored deep into the ground, where gradual decay may take place. High activity solid wastes could be packed in shielded containers, while low level liquid and gaseous wastes may be diluted before disposal for best possible safety.