## Long Answer Type Questions

## [5 marks]

**Q. 1. How has industrialisation led to an increase in air pollution? What steps should be taken to check air pollution?**

**Ans.** Industrialisation has led to increased pollution of air in following ways:

**(i)** Due to industrialisation, the consumption of fossil fuels has increased. Combustion of fossil fuels has increased production of gases like CO, $SO_2$, $SO_3$, $NO_2$ and $CO_2$ which are toxic.

**(ii)** There has been depletion in the ozone layer because of increase in the production of chemicals like chlorofluorocarbons which are used as insulators, refrigerants, solvents and aerosol propellants. This has resulted in the entry of UV rays into Earth's atmosphere, which has affected various organisms.

**(iii)** Combustion of fossil fuels also increases the amount of suspended particles in air causing pollution.

**Steps taken to check air pollution are:**

**(i)** Planting more trees, as they purify air by intake of $CO_2$ gas and release of $O_2$. This will reduce the greenhouse effect.

**(ii)** Reducing the consumption of fossil fuels.

**(iii)** Laying emphasis on the use of non-conventional sources of energy like wind energy, solar energy, tidal energy, etc., which reduce pollution to great extent.

**Q. 2. What is the importance of water for plant life?**

**Ans.** Water is very essential for the survival and growth of plants.

(i) Seeds germinate in the presence of water.

(ii) Water helps in the growth of plants.

(iii) Plants manufacture their food by the process of photosynthesis in the presence of sunlight, carbon dioxide, water and a green pigment called chlorophyll.

(iv) Water dissolves the nutrients present in the soil which is then transported to the various parts of the plant.

(v) Water provides a medium for transportation of food and minerals within the plant.

(vi) Water also helps in maintenance of the plant structure by providing appropriate pressure to the plant tissues.

**Q. 3. How is carbon stored in our planet?**

**Ans.** Carbon is stored in the following ways.

(i) As organic molecules, in the living and dead organisms found in the biosphere.

(ii) As carbon dioxide in the atmosphere.

(iii) As organic matter in soils.

(iv) As fossil fuels and sedimentary rock deposits such as lime stone, dolomite and chalk.

(v) In the oceans as dissolved atmospheric carbon dioxide and as carbonate shells in marine organisms.

**Q. 4. What are the sources of soil pollution?**

**Ans.** Soil pollution mainly results from the following sources:

**(i) Industrial wastes:** wastes discharged from pulp and paper mills, chemical industries,
oil refineries, coal and mining industries, etc., are responsible for soil pollution.

**(ii) Urban wastes:** solid wastes and refuse in urban areas contribute to soil pollution.

**(iii) Radioactive pollutants:** radioactive substances resulting from explosions of nuclear devices, atmospheric fall out from nuclear dust penetrate the soil and pollute it.

**(iv) Fertilisers:** excessive application of fertilisers to the soil to increase food and vegetable production causes soil pollution.

**(v) Pesticides:** different kinds of pesticides used to control pests cause soil pollution.

**(vi) Farm wastes:** wastes from cows, cattle, pigs and poultries are one of the major sources of soil pollution.

**(vii) Chemical and metallic pollutants:** synthetic chemicals are a source of trace metals which are added to the soil either deliberately or as an impurity.

**(viii) Biological agents:** soil gets large quantities of human, animal, bird excreta which constitute the major source of soil pollution by biological agents.

**Q. 5. What are the effects of soil pollution?**

**Ans**. Effects of soil pollution:

**(i)** Chemicals, pesticides, metals, industrial wastes, animal refuse and other pollutants are extremely toxic to living beings and plant products, and cause severe chronic diseases posing a serious threat to human health.

**(ii)** Solid wastes result in offensive odour and cause clogging of groundwater filters.

**(iii)** Polluted soil damages crops and agricultural production due to decreased soil fertility.

**(iv)** When food containing radioactive substances is consumed by human beings, they cause a number of undesirable diseases of the digestive track, thyroid gland, etc.

**(v)** Pesticides not only pose a potential hazard to man, animal, fish and livestock, but they severely affect the desired yield of crops, fruits and vegetables, which become unfit for eating.

**Q. 6. How can we control soil pollution?**

**Ans.** Following measures may be taken to control soil pollution:

(i) Proper dumping of unwanted materials.

(ii) Organic wastes contained in animal dung can be used for preparation of compost, manure and biogas rather than throwing them as waste and polluting the soil.

(iii) Natural soil microorganisms should be used to increase the soil fertility rather than the use of pesticides and insecticides.

(iv) To minimise soil pollution, waste such as paper, plastics, glass, metals, chemicals and industrial wastes should be recycled and reduced instead of throwing in the soil.

(v) Use of chemicals, insecticides, etc., should be banned.

**Q. 7. Describe the water cycle.**

**Ans.** The water cycle is the journey water takes as it circulates from the land to the sky and back again. It involves the following steps:

(i) The Sun's heat provides the energy for evaporation of water from the Earth's surface (oceans, lakes, rivers, etc.)

(ii) Plants also lose water into the air by the process of transpiration.

(iii) Wind carries the moisture laden air. The water vapour eventually condenses forming tiny droplets in clouds. When clouds meet cool air over the land, precipitation (rain, hail or snow) is triggered and water returns to the land in the form of rainfall.

(iv) All water that falls on the land does not immediately flow back into the sea. Some water seeps into the ground. Some of the underground water is trapped between rocks or clay layers. This is called ground water. Some of this ground water finds its way to the surface through springs. We also bring the ground water to the surface for our use through wells or tube wells. Water is also used terrestrial animals and plants for various life processes. Most of the water flows down the hills as run offs (above the ground or underground), eventually returning to the seas as slightly salty water.

**Q. 8. Describe the steps and processes involved in the nitrogen cycle.**

**Ans.** The various steps of nitrogen cycle are as follows:

**(i) Nitrogen fixation:** It is the conversion of atmospheric nitrogen into water-soluble compounds like nitrates and nitrites either by the free-living bacteria or *Rhizobium* that are found in the root nodules of legumes. Atmospheric nitrogen also gets converted into nitrates and nitrites naturally by lightning.

**(ii) Ammonification:** Death and decay of plant bodies release ammonia into the atmosphere. Animals also give out ammonia along with urea and uric acid as excretory products. These nitrogenous compounds are converted to ammonia by putrefying bacteria and the process is known as ammonification.

**(iii) Nitrification:** Ammonia is then converted first into nitrites and then into nitrates by the nitrifying bacteria, the process being called as nitrification. Plants generally take up nitrates and nitrites and convert them into amino acids.

**(iv) Denitrification:** When the animal or the plant dies, denitrifying bacteria in the soil convert the various compounds of nitrogen back into nitrates and nitrites. The nitrates and nitrites are converted into elemental nitrogen by *Pseudomonas*. This process is called denitrification.

**Q. 9. Why is replenishment of forests necessary?**

**Ans.** Forests need to be replenished because of the following reasons:

**(i) Rainfall:** During transpiration, trees give out enormous amount of water vapour. This water vapour helps in the formation of rain clouds. So, if trees are cut and not replenished, the rainfall in the area will reduce.

**(ii) Natural rate of tree growth:** Forests cannot be regrown in a few days or months as trees take many years to grow fully. Thus, it becomes necessary to replenish the forests periodically.

**(iii) Soil erosion:** If a large number of trees are cut, the soil becomes naked. The top soil, which is rich in organic matter will be washed away by water or carried away by wind. Trees help in binding the soil.

**(iv) Carbon dioxide-oxygen balance:** Forests have a very large number of trees which give out $O_2$ and take in $CO_2$ in the day by photosynthesis. In this way, they help in maintaining the carbon dioxide-oxygen balance in the atmosphere.

**(v) Timber and fuel:** Forests are the best suppliers of timber for furniture and fuel. So, for their constant supply forests need to be replenished.

**Q. 10. What are the sources of oxygen in the atmosphere?**

**Ans.** Sources of oxygen in the atmosphere:

(i) Early in the evolution of the Earth, oxygen is believed to have been released from water vapour by ultra-violet radiations and accumulated in the atmosphere as the hydrogen escaped into the outer layer of the Earth's atmosphere.

(ii) The main driving factor of the oxygen cycle is when water and carbon dioxide combine in the presence of sunlight and chlorophyll to form glucose and oxygen by the process of photosynthesis.

(iii) Molecular oxygen is mainly contained in rocks and minerals.

(iv) Molecular oxygen is also released in the atmosphere by the process of photolysis.

(v) The weathering process initiated by organisms can also free the oxygen from the lithosphere.

(vi) Plants and animals extract nutrient minerals from rocks and release oxygen in the process.

**Q. 11. Why is it necessary to conserve natural resources? How can they be conserved?**

**Ans.** Natural resources are a precious gift of nature to the mankind. The natural resources and the living organisms are interdependent on each other and form the biosphere. We should use them judiciously for our benefit, but avoid their depletion. The only way to create balance and harmony with nature is to conserve our natural resources.

**Some of the ways of conservation of our natural resources are:**

(i) They should be protected from being polluted.

(ii) More and more vegetation should be planted and endangered species of plants and animals should be protected.

(iii) The wild animals should be conserved by establishing national parks and sanctuaries.

(iv) Hunting of animals should be prohibited.

(v) Recycling of waste materials must be encouraged.

(vi) We should use alternative sources of energy rather than conventional sources like fossil fuels.