INDIAN SCHOOL MUSCAT

Department of Chemistry

Chapter: Natural Resources

CLASS - IX

Q1. What is soil? How is it formed? State the major factors that decide the structure of a soil. What role does it play?

A. Soil is a mixture of small particles of rocks, decayed living organisms and various forms of microscopic life. Soil is formed by the following actions:

i) Action of sun: Sun heats up the rocks during day which cools down at night. Due to alternate heating and cooling, cracks are formed on the rocks due to which the rocks ultimately break down into smaller pieces.

ii) Action of water: Flowing water wears away rocks. Sometimes when water freezes on the cracks of rocks, the rocks break into smaller rocks and particles.

iii) Action of wind: Winds wears out the rocks and forms soil.

iv) Action of living organism: Roots of plants break down the rocks. Lichen while growing on rock surfaces, releases certain chemicals which powder down the rocks. The type of soil is decided by the average size of particles found in it the quality of the soil is decided by the amount of humus and the microscopic organisms found in it.

The nutrients content of a soil and the amount of humus present in it decide which plants will thrive on that soil. The topmost layer of the soil that contains humus and living organisms in addition to the soil particles is called the topsoil. The quality of the topsoil is an important factor that decides biodiversity in that area.

Q2) a) What causes wind?

b) List any two methods of preventing soil erosion.

A. a) Wind is caused by uneven heating of the atmosphere in different parts of the earth.

b) i. Soil erosion can be prevented by planting trees and sowing grasses.

ii. It can be prevented by constructing strong embankment along the river banks.

Q3) Define biosphere. What are the two main functions of a biosphere?

A. Biosphere is the life –supporting zone of the earth where the atmosphere, the hydrosphere and the lithosphere interact and make life possible. It occupies the highest positions or level in the hierarchy of organization on the earth. Two main functions of biosphere are as follows:

i)It prepares the food through producers by the process of photosynthesis. In this process, the sunlight is converted into chemical energy.

ii)It helps in the transfer of food and energy from one organism to another through food chains. This is necessary for the maintenance of life in biosphere.

Q4) a) Differentiate between biodegradable and non-biodegradable substances.
b) How is acid rain causing harm to Taj Mahal?
c) What is smog?

A. a) **Biodegradable**

i.These are broken down into simpler harmless substances in nature.
ii.They do not concentrate in food chain
Iii.Micro-organisms work on it.

Non-Biodegradable

i.These cannot be broken down into simpler harmless substances in nature.
ii.They may concentrate in food chains.
Iii.Micro-organisms do not work on it.

b) Acid rain which contains sulphuric acid reacts with the marbles of Taj Mahal and makes it yellow in color.
c) In cold weather, water vapor condenses around unburnt carbon particles or hydrocarbons and lowers the visibility. This is called smog.

Q5).What is soil erosion? Give two methods of reducing.

A. Soil erosion us the removal and thinning of the fertile topsoil from a region due to climatic and physical processes, such as high rainfall and wind etc., Two methods of reducing soil erosion are:

i. Afforestation- Terrace farming
ii. Constructing strong embankments along the river banks.

Q6) How does air pollution affect the living beings on earth?

A. Polluted air causes many diseases and reactions. Some of the effects of different air pollutants are as follows:

i. Dust – Allergic reactions.
ii. Smoke- Respiratory problems
iii. CO – Respiratory problems
iv. CO_2 in excess- Greenhouse effect and atmospheric temperature rises
v. SO_2 –Damages lungs, produces acid rain and causes corrosion.
vi. Oxides of nitrogen- Lungs congestion, produces smog.
vii. Metal particulates like-
Lead- Lead poisoning, damage to brain of children
Mercury- Brain damage, mental retardation, paralysis
Asbestos- Lung Cancer, Asbestosis.

Q7) How is the life of organisms living in water affected when water gets polluted?

A. The life of organisms living in water is affected when water gets polluted in the following ways:

i. **Domestic Waste** carries pathogens of diseases which cause diseases in aquatic animals.
ii. **Fertilizers and pesticides** cause eutrophication which reduces oxygen available to aquatic animals.
iii. **Industrial wastes** carry toxins that harm the aquatic organism.

Q8) Soil formation is done by both abiotic and biotic factors. List the names of these factors by classifying them as abiotic and biotic.

A. **Abiotic Factors** – Sun, Water, Wind.

Biotic Factors – Lichens, Mosses, Trees, Shrubs and herbs.

Q9) How do fossils fuels cause air pollution?

A. i. Burning of fossils fuels like coal and petroleum releases oxides of nitrogen and Sulphur. Inhalation of these gases is dangerous. These gases also dissolve in rain to give rise to acid rain.

ii. The combustion of fossil fuel also increases the amount of suspended particles in air. These suspended particles could be unburnt carbon particles or substances called hydrocarbons. The presence of high levels of all these pollutants reduces visibility in cold weather where water also condenses out of air forming smog. Smog is an indication of air pollution.

Q10) Why does water need conservation even though large oceans surround the land masses?

A. Marine water is unfit for human and plant consumption. So, the terrestrial organisms have to depend on fresh water resources. Therefore, limited freshwater resources need conservation to cater to the demands.

Q11) Why step farming is common in hills?

Step farming is common in hills to slowdown the speed of rainwater currents and increasing the water absorption by soils. This is practiced to check soil erosion through water currents on the slopes.

Q12) What are the causes of water pollution?

A. Causes of water pollution:

i. Agricultural substances such as fertilizers and pesticides are used to increases crop yield and some percentage of these washed into the water bodies that pollute the water.

ii. Sewage from homes and wastes from factories are dumped into rivers or lakes.

iii. Hot and cold water discharged from industries make a change in the temperature, which is harmful for aquatic organisms.

iv. All these affect the balance among various organisms that are found in water bodies.

Q13) List two ways in which soil erosion is caused.

A. i. Wind causes soil erosion by carrying away the top soil particles.
ii.Deforestation leads to soil erosion.

Q14) Name two gases given out by burning fossil fuels which dissolve in rain water to form acid rain.

A. Burning of fossil fuel gives out oxides of Sulphur and oxides of nitrogen as pollutants which cause acid rain.

Q15) What is the role of plants in controlling air pollution and flood?

A. The burning of fossil fuels and other human activities has caused air pollution by increasing the amount of CO_2 in the atmosphere. Photosynthesis in plants uses CO_2, thus controlling air pollution. Further, plants make the soil compact and protect it from floods. Plants control global warming by consuming the greenhouse gas CO_2 and thereby control melting of ice and flood.

VALUE BASED QUESTION:

Q1. There is small pond in a village near the crop fields. The farmers use various manures and fertilizers in the field to enhance crop production. Recently, people observe large scale dying of fishes in the pond. Unable to find any solution, the farmers meet your father for this advice. Your father takes an appointment with the fishery officer of the area and discusses the issue with him.

i. What may be the reason for dying of fishes in the pond?
ii. What suggestion will your father give to the farmers?
iii. What value is shown by your father?

A. i. During rain or irrigation, the fertilizers used in the fields get washed out and falls in the pond. This results in heavy growth of algae in the pond which reduces dissolved oxygen quantity. Fishes have died in the pond due to shortage of dissolver oxygen.
ii. The farmers will be advised to avoid excess use of fertilizers and pesticides.
iii. He has shown the attitude to help others.