Question:1

Write one word for the following.

1.Decayed plant and animal remains .....

2.Disintegration of rocks on the Earth's surface caused by exposure to natural forces .....

3.Removal of trees on a large scale .....

4.Planting of trees on large scale on deforested land .....

5.A type of pesticide that should be used to decrease soil pollution .....

Solution:

1. Humus
2. Weathering
3. Deforestation
4. Afforestation
5. Organic pesticide

Question:2

Define the following

1. Soil profile
2. Soil erosion
3. Soil conservation

Solution:

1. Soil profile is a vertical section of the soil from the top soil, down to the parent rock, showing different soil layers.
2. Soil erosion is defined as the removal of soil $particularlythetopsoil$by agents such as wind or running water.
3. Steps adopted to avoid or at least reduce soil erosion is known as soil conservation.

Question:3

Write T for the true statement and F for the false one. Correct the false statement$s$.

1. In physical weathering, the chemical nature of the rock is altered.
2. The difference in particle size of the soil constituents determines its colour.

3. Sandy soil has high porosity, which prevents the retention of water.
4. Lime is added to basic soils to lower the pH.
5. The method of growing crops on steps in hilly region is called plantation farming.

Solution:

1. F. Physical weathering does not alter the chemical nature of the weathered rocks.
2. F. The difference in particle size determines soil texture.
3. T. Sandy soil is porous and water drains out. Therefore, sandy soil is unable to retain water.
4. F. Lime is added to acidic soils to raise pH to near neutral values.
5. F. The method of growing crops on steps in hilly regions is known as terrace farming.

Question:4

Chemical weathering is the fastest in

a hot and moist climate
b cold and moist climate
c hot and dry climate
d cold and dry climate

Solution:

a hot and moist climate
Chemical weathering of rocks into soil is facilitated by hot and moist climates.

Question:5

Which one of the following layers of soil is characterized by cracks and crevices?

a Topsoil
b Subsoil
c Parent rock
d Bed rock

Solution:

c Parent rock

The parent rock layer is characterised by cracks and crevices.

Question:6

Which type of soil dries out quickly after a rain?

a Loamy

b Clayey
c Sandy
d Subsoil
Solution:
c Sandy
Sandy soil prevents water retention and it dries up quickly.

Question:7
The four main components of soil are

a tiny pieces of rock, humus, air and sand
b humus, clay, water and salts
c air, water, tiny pieces of rock and manure
d tiny pieces of rock, air water and humus
Solution:
b humus, clay, water and salts

The four main components of soil are humus, clay, water and salts.

Question:8
Soil pollution is caused by

a excessive use of pesticides and fertilizers
b spilling or leakage of chemicals
c acid rain
d all of these
Solution:
d All of these
Excessive pesticide and fertilizer use, spillage of chemicals and acid rain can all lead to soil pollution.

Question:9
Differentiate between physical and chemical weathering.
Solution:

Physical weathering	Chemical weathering

Physical weathering is the breaking down of rocks into smaller pieces.	Chemical weathering involves the breaking down of minerals in a rock into new minerals.
It is a mechanical and physical process.	It is a chemical process.
The nature of the rocks is not changed by physical weathering.	The nature/chemical composition of rocks is altered by chemical weathering.
Frost, growing plant roots, animals etc. are all agents of physical weathering.	Water is the main natural agent of chemical weathering.

Question:10

Give two main characteristics of:

a Sandy soil
b Loamy soil
c Clayey soil

Solution:

aSandy soil:

- Sandy soil has large particles with big, open air spaces between particles.
- It does not hold water well and dries quickly.

b Loamy soil:

- It has a high humus content.
- It is porous and retains water.

c Clayey soil:

- It is made up of very fine particles.
- Clayey soil retains water well and becomes very sticky when wet.

Question:11

Priya poured a litre of water into a pot filled with garden soil. The pot had a hole at its base through which water seeped out and was collected in a beaker. After a while, she measured the amount of water in the beaker and found it to be 450 ml. Find the percentage of water absorption of the soil if it weighed 1.5 kg in the pot.

Solution:
Priya pours 1 litre of water into the pot. Therefore, Priya pours in 1000 ml of water.

The amount of water seeped out is 450 ml.
Therefore, 1000 - 450 = 550 ml is retained by the soil.

The weight of soil is 1.5 kg = 1500 g.

Percentage of water absorbed $= \frac{550}{1000} \times 100 = 55\%$

Water absorbed as a percentage of soil weight = $\frac{550}{1500} \times 100 = 36.67\%$

Question:12
Explain the different stages of soil formation.
Solution:
Following are the stages in soil formation:

1. Weathering, either chemical or physical, causes large rocks to break into smaller pieces, particularly near the surface.
2. The smaller rocks weather into a fine layer of particles at the surface. Microorganisms decompose the remains the dead plants and animals and add humus to this layer making it nutrient rich.
3. Minerals and salts from deep within the ground are carried by water and contribute to the mineral profile of the soil.

Question:13
Discuss the factors on which soil formation depends.
Solution:
Soil formation depends upon various factors such as:

1. **Climatic conditions:** Climatic factors such as wind, rain, frost, etc., play an important role in loosening up rocks and weathering them into smaller pieces. Soil formation happens fastest in areas with hot and humid climatic conditions where bacterial activity rapidly breaks down dead plant and animal matter. However, soil formation is slower in regions of cold climate.
2. **Characteristics of parent rock:** The type of parent rock also determines the nature of soil formation and the time required for soil formation. The minerals in the soil are in general derived from the minerals in the parent rocks.
3. **Slope of land:** The slope of the land also influences soil type. In hilly regions, where the land is

sloped, soil is frequently washed away and the soil is thin. On the plains, soil deposits are relatively undisturbed and a thick layer of soil is formed.

Question:14

Explain different horizons of soil profile.

Solution:

Following are the different horizons of soil profile:

1. **Horizon O**: This is the topmost layer of soil, lying just above the topsoil layer and extends from the surface to a depth of 2 inches. It is rich in organic material.
2. **Horizon A:** Horizon A is the topsoil. It consists of fine particles and is rich in humus. This imparts the top soil its dark colour. The topsoil is soft, porous and can retain water. Horizon A extends from about 2 inches to 10 inches below the surface.
3. **Horizon B:** Horizon B extends from 10 inches to 30 inches below the surface. It is called the subsoil and is rich in minerals that have seeped in the water. It also contains fine particles of soil, compactly packed together.
4. **Horizon C:** This layer extends from about 30 inches, down to 48 inches below the surface. It contains partly weather pieces of rocks . This layer is characterised by cracks and fissures and it is very difficult to dig below this level.
5. **Horizon R:** Horizon R refers to bedrock. This rock determines the composition of the soil.

Question:15

What is soil erosion? Give the main reasons for soil erosion and methods by which it can be reduced.

Solution:

The removal of the fertile top layers of soil by running water or wind is termed as soil erosion. The main reasons for accelerated soil erosion are:

1. **Deforestation:** Once trees are felled, the soil is left loose and can be removed easily by running water or wind.
2. **Overgrazing:** The soil is then poorly bound and can be removed by wind or water.
3. **Floods and heavy rains:** Floods and heavy rains wash away large amounts of soil , particularly when there are no trees and the land is barren.
4. **Poor farming practises:** Improper farming on hill sides makes soil more vulnerable to erosion by wind or water.

Soil erosion can be minimized by:

1. The growth of trees binds soil and minimizes erosion, known as afforestation.
2. Building of dams may also help to stop the flow of water during heavy rains.

3. Method of terrace farming should be used in hilly areas to minimize loss of soil on sloping terrain.

Question:16

What are the main sources of soil pollution? Write down the measures to control soil pollution.

Solution:

The major source of soil pollution are:

1. Acid rains occurring due to factory pollution, mines and industries.
2. Excessive use of pesticides and fertilizers that get accumulated in the soil.
3. Usage of materials such as plastics and metals that do not decompose easily.

Following are the measures to control soil pollution:

1. Avoid dumping solid waste on the land.
2. Biogas should be produced from plant and animal wastes.
3. Organic pesticides should be used.

Question:17

What is soil fertility? How can we improve soil fertility?

Solution:

Soil fertility refers to the ability of soil to provide nutrients in adequate quantity and balance to allow growth of plants.

Soil fertility can be improved by:

- Controlling the soil pH.
- Adjusting the air content in the soil.
- Incorporation of fertilizers into the soil.

Question:18

How is humus formed?

Solution:

Humus is formed from the decayed remains of dead plants and animals.

Question:19

How can we identify different types of soils?

Solution:

We can identify different types of soil by observing their texture and colour.

Question:20

Discuss the importance of moisture present in soil.

Solution:

Moisture in the soil is important to determine the texture of the soil. It binds soil particles together. The moisture also determines when irrigation is necessary and the amount of water required.

Question:21

Which soil is best for growing crops and why?

Solution:

Loamy soil helps retain water and also has high humus content. Therefore, loamy soil can provide adequate water and nutrients necessary for the development of crops.