NCERT Solution

Soil

Exercise

Tick the most suitable answer in questions 1 and 2.

1. In addition to the rock particles, the soil contains:

(i) Air and water
(ii) Water and plants
(iii) Minerals, organic matter, air and water
(iv) Water, air and plants

Answer:
Solution: (iii)

2. The water holding capacity is the highest in:

(i) sandy soil
(ii) clayey soil
(iii) loamy soil
(iv) mixture of sand and loam

Answer:
(ii) : **The water holding capacity is the highest in clayey soil.**

3. Match the items in Column I with those in Column II:

Column I	Column II
(i) A home for living organisms	(a) Large particles
(ii) Upper layer of the soil	(b) All kinds of soil
(iii) sandy soil	(c) Dark in colour
(iv) Middle layer of the soil	(d) Small particles and packed tight
(v) Clayey soil	(e) Lesser amount of humus

Answer:

Column I	Column II
A home for living organisms	All kinds of soil
Upper layer of the soil	Dark in colour
sandy soil	Large particles
Middle layer of the soil	Lesser amount of humus
Clayey soil	Small particles and packed tight

4. Explain how soil is formed.

Answer:

Soil is formed by the breaking down of rocks by the action of wind, water and climate. This process is called weathering. The nature of any soil depends upon the rocks from which it has been formed and the type of vegetation that grows in it.

Formation of soil is given in details as follows:

(a) Earthquakes or Volcanic Eruptions: There is a hard layer of rock just below the earth surface. Due to natural processes like earthquakes and volcanic eruptions these big chunk of rocks are broken into smaller pieces and come on the surface of the earth.

(b) Weathering of rocks: due to fast blowing winds, falling of snow, actions of glaciers and running water of rains etc. the fine particles from the surface of rocks are carried away to different places. During this process, which is very slow and takes thousands of years, the sizes of these particles are further reduced. This whole process is called as 'physical weathering'.

(c) Corrosion or Decomposition of rocks: The smaller particles of rocks obtained due to weathering get further decomposed on long exposure to air and moisture. These processes range from oxidation, reduction, hydration, hydrolysis and carbonation. Lichens and other plants help in the process, e.g. rocks of minerals like feldspar and mica combine with water through the process of hydration and become soft and easily disintegrable. Silicate rocks on hydrolysis produce silicate clays. These are very slow process known as 'chemical weathering'.

(d) Addition of Humus: Finally the decomposed parts of dead plants and organisms get mixed up with the soil formed above. This gives the soil enough energy in the form of organic matter.

There are other factors also influencing soil formation such as:

1. Climate
2. Vegetation
3. Parent rocks
4. Time

5. How is clayey soil useful for crops?

Answer:

Clayey soil is useful for growing certain kind of crops of cereals like wheat and grams, which needs excess of water. Clayey soil is good for retaining water. For the same reason clayey soil with organic matters are good for Paddy.

6. **List the difference between clayey soil and sandy soil.**

Answer:

Clayey Soil	Sandy Soil
Proportional of fine particles is large.	Proportional of big particles is large.
It has the highest porosity among all type of soils.	Pores present are of continuous type i.e. 'open pores'.
The clayey soil is heavy, has less air and more water content.	The sand is light in weight and has less water capacity.
The sand is almost dry as it cannot retain water due to large particle size.	The sand is almost dry as it cannot retain water due to large particle size.
It is suitable for crops like Paddy, wheat and grams	Sandy soil is suitable for peanuts and sandy-loam is for cotton crops.

7. **Sketch the cross section of soil and label the various layers.**

A-horizon - rich in humus and minerals**,** this layer is generally soft, porous and can retain more water.

B-horizon - lesser amount of humus but more of minerals, generally harder and more compact

C-horizon - made up of small lumps of rocks with cracks and crevices

Bedrock - hard and difficult to dig with a spade

8. **Razia conducted an experiment in the field related to the rate of percolation. She observed that it took 40 min for 200 mL of water to percolate through the soil sample. Calculate the rate of percolation.**

Answer:

Given amount of water= 200 mL

Percolation time = 40 min

Percolation rate (mL/min)= $\frac{\text{Amount of water (mL)}}{\text{Percolation time (min)}} = \frac{200}{40}$= 5 mL/min

9: Explain how soil pollution and soil erosion could be prevented.

Answer:

Prevention of Soil Pollution:

Following steps are necessary to prevent the soil pollution:

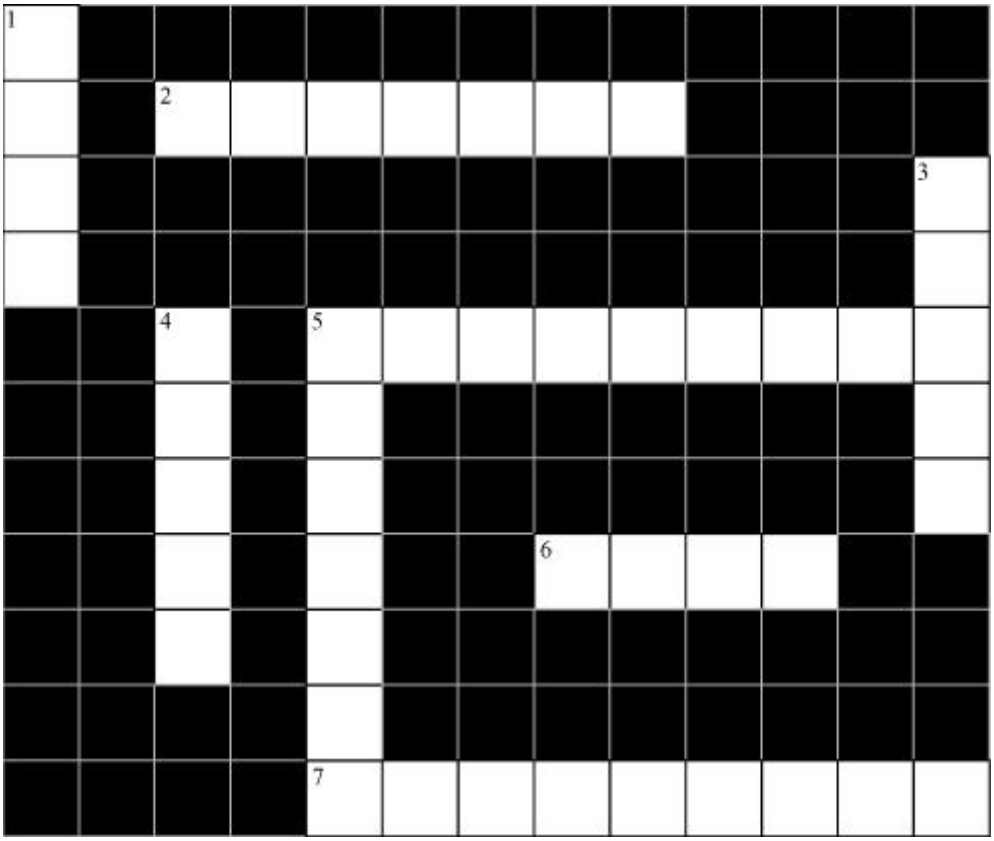
- There should be a complete ban on the use of polythene and plastic bags.
- Waste products and chemicals should be treated before they are released into the soil.
- The use of fertilizers and pesticides should be minimized.

Prevention of Soil Erosion:

Soil erosion can be prevented by taking the following steps:

- Planting trees (afforestation)
- Protecting the existing forests and trees
- Holding suitable minerals and organic matter in proper amounts
- Maintaining porous structure of the soil
- Control and reclamation of ravines and shifting of cultivation.

10. Solve the following crossword puzzle with the clues given:



Across

2. Plantation prevents it.

5. Use should be banned to avoid soil pollution.

6. Type of soil used for making pottery.

7. Living organism in the soil.

Down

1. In desert soil erosion occurs through.

3. Clay and loam are suitable for cereals like.

4. This type of soil can hold very little water.

5. Collective name for layers of soil.

Answer: