



INDIAN SCHOOL AL WADI AL KABIR



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| Class: VII | DEPARTMENT: SCIENCE-2021-2022 | DATE: 14-11-2021 |
| WORKSHEET NO.: 10 WITH ANSWERS | TOPIC: SOIL | NOTE: A4 FILE FORMAT |
| NAME OF THE STUDENT | CLASS & SEC: | ROLL NO. |

I. VERY SHORT ANSWER (1M):

1. Define the following terms-

- Humus- [Hint: The organic matter formed by the decomposition of dead plants and animals by the microorganisms is called humus.]
- Soil erosion- [Hint: The gradual removal of topsoil by the action of wind, flowing water, waves and snow is known as soil erosion.]
- Weathering- [Hint: The process of breaking down of rocks into smaller particles by the action of wind, water and climate.]

2. Which of the climatic factors affect the soil profile and bring changes in the soil structure? [Hint: Soil is affected by wind, rainfall, light, temperature and humidity.]

3. Which of the two provides more air to plant roots: sandy soil or clayey soil? Why? [Hint: Sandy soil. Sand particles are big in size having large spaces between them. These spaces are filled with air. Thus, sandy soil is well aerated.]

4. Why does topsoil has most humus? [Hint: Topsoil provides shelter to many decomposers, insects, worms, etc. Humus is formed by the decaying remains of plants and animals by the decomposers]

5. It has been observed that 8-10 days after the rains, the level of water in a nearby well rises. Which type of soil would allow rainwater to reach the well faster and in greater amount? Give reason for your choice. [Hint: Sandy soil. The particles of sandy soil are big in size with large space between them. Thus, this soil has highest percolation rate of water.]

6. Though sandy soil is well aerated; it is not fit for growing crops. Why? [Hint: Sandy soil cannot retain water for growing crops.]

7. Name the two factors that determine the various types of vegetation and crops that might grow in any region. [Hint: The climatic factors as well as the components of soil determine the various types of vegetation and crops that might grow in any region]

8. The term used to denote different layers of the soil. [Hint: Horizons]

9. Soil has particles of different sizes. Arrange the words given below in increasing order of their particle size. rock, clay, sand, gravel [Hint: clay, sand, gravel, rock]

10. Name two non - biodegradable wastes that can pollute the soil.

[Hint: Plastic and Polythene are the non-biodegradable wastes that can pollute the soil.]

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below

i) Both A and R are true and R is correct explanation of the assertion.

ii) Both A and R are true but R is not the correct explanation of the assertion.

iii) A is true but R is false.

iv) A is false but R is true

11. Assertion (A): The water holding capacity is the highest in clayey soil.

Reason (R): The particles of the clayey soil are big in size.

iii) A is true but R is false.

12. Assertion (A): Soil erosion doesn't affect the fertility of soil.

Reason (R): Humus present in the soil is eroded along with soil.

iv) A is false but R is true

13. Assertion (A): Loamy soil is considered best for growing plants.

Reason (R): The space between the particles of loamy soil has right water holding capacity and is well aerated.

i) Both A and R are true and R is the correct explanation of the assertion.

II. CASE STUDY BASED QUESTIONS

A student visits two types of field and observes that soil from field A has high percolation rate of water, while soil from field B has low percolation rate. In field B, paddy crop was grown while in field A, there was no standing crop.

(i) Name the types of soil present in two fields.

a) A-Loamy soil, B- Clayey soil

b) A-Loamy soil, B- Sandy soil

c) A- Sandy soil, B- Clayey soil

d) A- Sandy soil, B- loamy soil

(ii) Percolation rate is measured in the unit:

a) ml/min

b) min/ml

c) lit/min

d) ml/sec

(iii) Following are few statements related to soil

1) Weathering is a very fast process of soil formation.

2) Percolation of water is faster in sandy soil.

3) Loamy soil contains only sand and clay.

4) Top soil contains the maximum amount of humus.

Which of the above statements are correct?

- a) (2) and (4) b) 1) and (3) c) (2) and (3) d) (1) and (2)

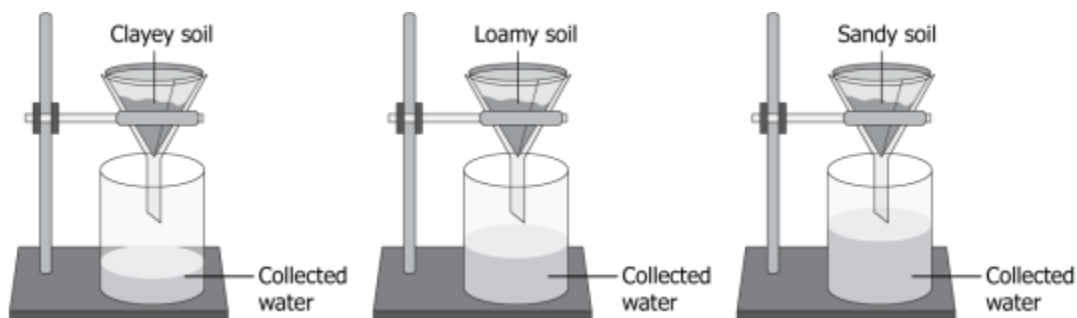
(iv) Which type of soil can lead to the maximum water logging in the fields?

- a) Loamy soil b) sandy soil c) Clayey soil d) Sandy-loam soil

(v) Which among the following shows decreasing order of percolation rate?

- a) Loamy soil, Clayey soil, Sandy soil
b) Sandy soil, Loamy soil, Clayey soil
c) Clayey soil, Loamy soil, Sandy soil
d) Clayey soil, Sandy soil, Loamy soil

2. A student made an arrangement to understand percolation rate of different types of soil as shown. He poured equal amount of water in all three of them and waited for around 10 minutes. Which of these explains the rate of percolation of the soil?



- a) sandy soil has the highest rate of percolation as water passes fastest through it.
b) clayey soil has the highest rate of percolation as water passes slowest through it.
c) clayey soil has the highest rate of percolation as it both retains and allows water to pass through.
d) loamy soil has the highest rate of percolation as it both retains and allows water to pass through.

III. PASSAGE BASED QUESTIONS:

1. Read the passage carefully and answer the questions.

Removal of forests, trees or other vegetation for commercial use, housing, agriculture or firewood without replanting is deforestation. It is one of the factors for global climatic change. Trees absorb carbon dioxide. They produce oxygen and maintain the amount of moisture in it by releasing water vapour into the atmosphere. They also prevent soil erosion by holding the soil tightly. Excessive cutting of trees may convert forest into a barren land and also increase flooding. Deforestation has also led to the loss of species. The World Wildlife Fund has reported that much of the logging industry contributes to deforestation is done illegally.

- i. Which of the following is not an effect of deforestation?
 - a) Flood
 - b) Global warming
 - c) Loss of species
 - d) **Tides**
- ii. Which of the following does not cause soil erosion?
 - a) Deforestation
 - b) **Afforestation**
 - c) Floods
 - d) Overgrazing
- iii. In which of the following processes land surface is removed by water, wind or ice?
 - a) Soil seepage
 - b) Soil ploughing
 - c) **Soil erosion**
 - d) Soil weathering
- iv. Which of the following prevents soil erosion?
 - a) Animals
 - b) Rocks
 - c) **Plants**
 - d) Mountains

IV.a) SHORT ANSWER TYPE QUESTIONS (2 M):

1. Explain why, the soil covered by vegetation is not eroded easily but the bare soil is eroded?

[Hint: The roots of vegetation (trees and other plants) growing in the soil bind the particles of top soil firmly and prevent erosion. On the other hand, the soil which is not covered with vegetation is eroded easily because there are no roots to which soil particles can bind.]

2. 480g of soil is dried completely under the sun. The mass of dried soil is 464g. Calculate the moisture content in the given sample of soil.

[Hint: Moisture content = $\frac{\text{Weight of moist soil (g)} - \text{Weight of dry soil (g)}}{\text{Weight of moist soil (g)}} \times 100$
 $= \frac{480\text{g} - 464\text{g}}{480\text{g}} \times 100 = 3.33\%$]

3. How does deforestation lead to soil erosion?

[Hint: Deforestation loosens the soil particles. It makes the land barren and increase the chances of flood and thus causes soil erosion.]

4. How is loamy soil good for crops?

[Hint: Loamy soil is a mixture of sand, clay, silt and humus. Space between the particles has right water holding capacity and soil is well aerated. Therefore, it is the best soil for growing crops.]

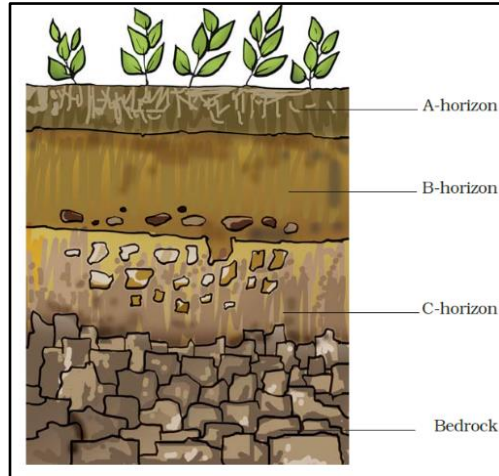
5. Why on a hot summer day does the soil seem to shimmer?

[Hint: On a hot summer day, water present in the soil evaporates. The water vapour coming out of the soil reflects the sunlight and the air above the soil seems to shimmer]

IV.b) SHORT ANSWER TYPE QUESTIONS (3 M):

1. Explain that “soil is an inseparable part of our life.” [Hint: (i) Soil is most important natural resource. It supports the growth of plants by holding the roots firmly. (ii) It helps in supplying water and nutrients to plants. (iii) It is the home for many organisms. (iv)It is essential for agriculture, which provides food, clothing and shelter.]

2. What is meant by soil soil profile and label the vertical section through called the soil profile]



profile? Draw a sketch of the various layers. [Hint: A different layers of the soil is

3. Rahul conducted an experiment to calculate the rate of percolation of water in a soil. He observed that it took 20 min for 200 mL of water to percolate through the soil sample. Calculate the rate of percolation.

$$\begin{aligned} \text{[Hint: Percolation rate (mL/min) = amount of water(mL) / percolation} \\ \text{time(min)} \\ &= 200\text{mL} / 20\text{min} = 10 \text{ mL /min}] \end{aligned}$$

4. Suppose that for a certain soil sample, it took 25 minutes for 100 mL of water to percolate. Calculate the rate of percolation of water.

$$\begin{aligned} \text{[Hint: Percolation rate (ml/min) = amount of water(mL) / percolation time(min)} \\ &= 100\text{mL} / 25\text{min} = 4 \text{ mL /min}] \end{aligned}$$

5. 100ml of water was taken in a measuring cylinder. This water was added drop- wise to 50g of dry soil kept on a filter paper in a funnel. When the water just started dripping from the soil in the funnel, the amount of water left in the measuring cylinder was found to be 80 ml. Calculate the percentage of water absorbed by the soil.

$$\begin{aligned} \text{[Percentage of water absorbed} \\ &= (\text{Initial volume of water- Final volume of water}) \times 100 / \text{weight of the soil} \\ &= (100 - 80) \times 100 / 50 = 40 \% \end{aligned}$$

6. Which soil would be most suitable for growing following crops? Give reasons for your choice.

- a) Gram [Hint: clayey-rich in humus, fertile, retains water]
- b) Lentils [Hint: loamy- right water holding capacity and is well aerated.]

- c) Cotton [Hint: sandy- loam or loam- drain water easily, hold plenty of air]
 d) Paddy [Hint: clayey – rich in humus, retain water]
7. Describe the bedrock layer of soil. [Hint: The last layer of the soil is called the bedrock. It contains large pieces of rocks that are not weathered or exposed to any winds or water. Bedrock cannot be dug with the help of a spade. It is very hard in texture.]
8. Clayey soil is heavy and has little air?. Give reason. [Hint: Clayey soil has small particles which are tightly packed together. This leaves little space between the particles for air. Water will be held in tiny gaps between the soil particles as it cannot drain out fast. Thus, soil becomes heavy when wet.]
9. What is soil pollution? How is it caused? [Hint: Contamination of soil by the presence of man-made chemicals or other undesirable substances is called soil pollution. Soil pollution is caused by:
- Excessive use of fertilisers, pesticides and insecticides.
 - Waste products from industries which contain chemicals.
 - Untreated sewage water.
 - Non-biodegradable waste like polythene, plastic, metal.]
10. What is the relation between rate of percolation and the amount of water retained? [Hint: Rate of percolation is the quantity of water percolated per unit time through soil. The amount of water retained is the quantity of water absorbed by soil. If a soil sample has high rate of percolation, less water will be retained by it. But if the soil has less rate of percolation, more water will be retained by it.]

V.LONG ANSWER TYPE QUESTIONS (5 M):

1. Differentiate between A- horizon and B-horizon and C-horizon of the soil.

[A horizon: The layer is also called as top-soil. It is rich in humus and minerals which makes it dark in colour. It is generally soft, porous and retains more water. It also provides shelter to many decomposers, insects, worms, etc. The roots of small plants are embedded entirely in the topsoil. **B-horizon:** It forms the middle layer which is less rich in humus and contains more of minerals. This layer has hard texture, light colour and is more compact than top soil. The roots of plants generally grow till this layer. **C-horizon** is made up of small lumps of rocks with cracks and crevices. Roots cannot penetrate through this layer. This layer lacks humus and is infertile.]

2. List the differences between clayey soil and sandy soil.

| SL.No. | CLAYEY SOIL | SANDY SOIL |
|--------|-----------------------------------|--|
| 1 | It has much smaller particles. | It has much larger particles. |
| 2 | Particles are tightly packed | Particles are loosely packed |
| 3 | It can hold good amount of water. | It cannot hold water. |
| 4 | Air content is low. | Air get trapped between the particles. |
| 5 | Good for growing various crops. | Not suitable for growing crops. |

3. Explain how soil pollution and soil erosion could be prevented.

[Prevention of soil pollution: To prevent soil pollution, its causes must be controlled.

1. Reduce the use of plastics: Plastics and polythene bags destroy the fertility of soil. Hence, these should be disposed off properly and if possible, their use should be avoided.
2. Industrial pollutants: Some waste products from industries and homes pollute soil. These pollutants should be treated chemically to make them harmless before they are disposed off.
3. Insecticides: Other pollutants of soil include pesticides and insecticides. Therefore, excessive use of these substances should be avoided.

Prevention of soil erosion: Following steps can be taken to reduce soil erosion:

1. Mass awareness to reduce deforestation for industrial purposes.
2. Helping local people to regenerate degrading forest.
3. Planting trees.]

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