



INDIAN SCHOOL AL WADI AL KABIR



Class: VII	DEPARTMENT: SCIENCE-2022-2023	DATE: 16-11-2022
WORKSHEET NO.: 12 WITH ANSWERS	TOPIC: SOIL	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

I.VERY SHORT ANSWER (1M):

1. Define the term humus.

[Hint: The organic matter formed by the decomposition of dead plants and animals by microorganisms is called humus.]

2. State the importance of humus in agriculture.

[Hint: Humus is an important element of the topsoil that determines soil fertility.]

3. What is weathering?

[Hint: The process of breaking down rocks into smaller particles by the action of wind, water and climate.]

4. Define soil erosion.

[Hint: The gradual removal of topsoil by the action of wind, flowing water, waves and snow is known as soil erosion.]

5. Why does topsoil has the 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.]

6. Name the best soil used for growing plants. [Hint: Loamy soil]

7. What is the term used to denote the amount of water present in the soil?

[Hint: The amount of water present is called soil moisture.]

8. Though sandy soil is well aerated, it is not fit for growing crops. Give reason.

[Hint: Sandy soil cannot retain water for growing crops.]

9. Soil has particles of different sizes. Arrange the words given below in the increasing order of their particle size: Rock, Clay, Sand, Gravel

[Hint: Clay, Sand, Gravel, Rock]

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

[Hint: Plastic and Polythene are examples of non-biodegradable waste 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 the 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 the soil.

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

iv) A is false but R is true

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

Reason (R): The space between the particles of loamy soil has the 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

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

(i) Define Percolation.

[Hint: Percolation can be defined as the property of the soil by which it allows the flow of water through it.]

(ii) Percolation rate is measured in the unit:

a) ml/min

b) min/ml

c) l/min

d) ml/sec

(iii) 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

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

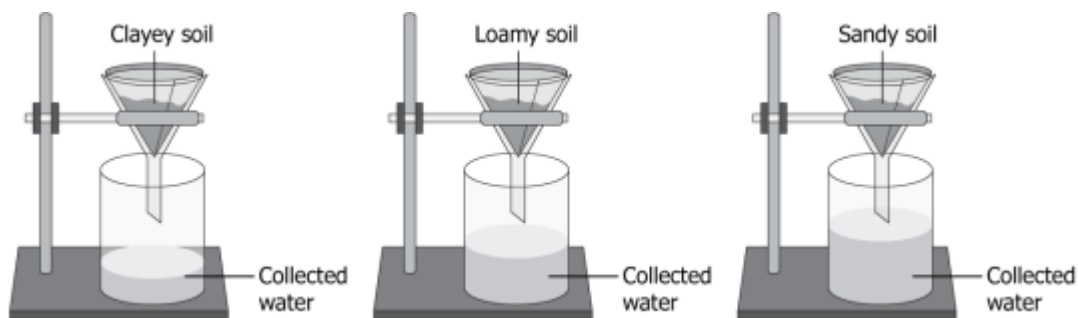
a) Loamy soil

b) Sandy soil

c) Clayey soil

d) Sandy-loam 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.



(i) How can you calculate the rate of percolation of water in the soil?

[Hint: The rate of percolation can be calculated as follows:

Rate of Percolation = Amount of water/Percolation time]

(ii) Which among the following statement explains the rate of percolation of the soil?

- a) **Sandy soil has the highest rate of percolation as water passes fast through it.**
- b) Clayey soil has the highest rate of percolation as water passes slow 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) 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

III. PASSAGE-BASED QUESTIONS:

1. Read the passage carefully and answer the questions.

Different types of soil are found in different places. Soil is affected by wind, rainfall, temperature, light and humidity. These are some important climatic factors that affect the soil profile and bring changes in the soil structure. The climatic factors, as well as the components of soil, determine the various types of vegetation and crops that might grow in any region. Clayey and loamy soils are suitable for growing wheat, gram and paddy. Cotton is grown in sandy loam soil.

i. Identify the climatic factors that affect the soil profile and bring changes in the soil structure.

- a) Wind and rainfall
- b) Light and Temperature
- c) Humidity
- d) **All of these.**

ii. Why does cotton grow well in sandy loam soil?

- a) It retains water.
- b) **Water is drained easily and hold plenty of air.**
- c) Rich in humus
- d) Fertile soil

iii. The types of vegetation and crops that are grown in any region depend on the:

- a) soil components
- b) climatic factors
- c) availability of water
- d) **components of soil and climatic factors**

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= $\frac{\text{Weight of moist soil (g)} - \text{Weight of dry soil (g)}}{\text{Weight of dry soil (g)}} \times 100$
= $\frac{480\text{g} - 464\text{g}}{464\text{g}} \times 100$]

3. How does deforestation lead to soil erosion?

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

4. Mention the characteristic features of loamy soil?

[Hint: Loamy soil is a mixture of sand, clay, silt and humus. Particles of loamy soil are smaller than sand and larger than clay. The space between the particles has the right water-holding capacity and the soil is well-aerated. Therefore, it is the best soil for growing crops.]

5. Air above farmland appears shimmering during the daytime. Give reason.

[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.]

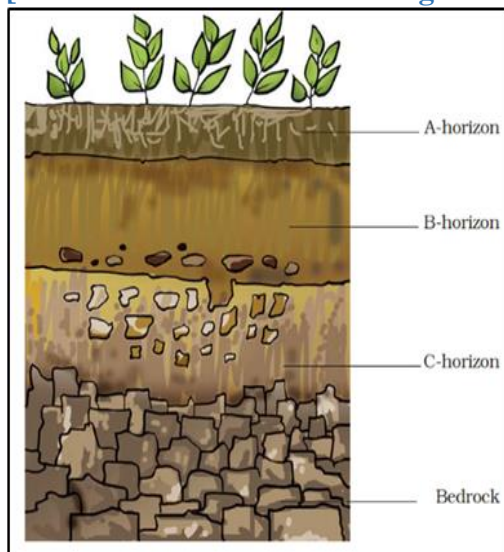
IV.b) SHORT ANSWER TYPE QUESTIONS (3 M):

1. Soil is essential for the existence of life on the earth. Explain.

[Hint: (i) Soil is the 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 profile? Draw a sketch of the soil profile and label the various layers.

[Hint: A vertical section through different layers of the soil is called the soil profile.]



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.

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

4. Calculate the rate of percolation of water in a certain soil sample if it takes 25 minutes for 100 mL of water to percolate.

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

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.

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

6. Which soil would be most suitable for growing the 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. 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. What are soil horizons? How are they different from one another? Explain in detail the various horizons of the soil.

[Hint: The different layers of soil are referred to as horizons. Each layer differs in feel (texture), colour, depth and chemical composition.

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 out 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. What is soil pollution? How is it caused? Describe various methods to prevent soil pollution.

[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 – bio degradable waste like polythene, plastic and metal.

To prevent soil pollution, its causes must be controlled.

- Excessive use of pesticides and insecticides should be avoided.
- Waste products from industries and homes pollute soil. These pollutants should be treated chemically to make them harmless before they are disposed off.
- Plastics and polythene bags destroy the fertility of soil. Hence, these should be disposed off properly or recycled and if possible, their use should be reduced.]

4. What is soil erosion? What are the factors that affect soil erosion? Suggest methods to prevent it.

[Hint: The gradual removal of topsoil by the action of wind, flowing water, waves and snow is known as soil erosion. Soil erosion affects the fertility of soil, as humus present in the soil is eroded along with soil. Some factors affecting soil erosion are as follows-

- Heavy rains and floods which make the soil particles loose.
- Deforestation loosens the soil particles. It makes the land barren and increases the chances of flood.
- Poor farming methods adopted by farmers.
- Overgrazing by animals.
- Construction of roads and houses.

The following steps can be taken to reduce soil erosion:

- Mass awareness to reduce deforestation for industrial purposes.
- Helping local people to regenerate the degrading forest.
- Planting trees.]

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