SOIL - OUR LIFE

TEACHING TASK (Page 40 – 43)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) What is the primary importance of soil in our lives?

Answer: B) Soil supports plant growth

Explanation: Soil is primarily important because it provides a medium for plant growth, supplying nutrients, water, and anchorage for roots, which are essential for food production and ecosystem stability.

2) Which of the following is NOT a usefulness of soil?

Answer: D) Producing oxygen

Explanation: Soil supports plant growth, filters water, and stores carbon dioxide, but it does not directly produce oxygen. Oxygen is produced by plants through photosynthesis, not by soil itself.

3) What is one way to explore soil and its connection to life?

Answer: C) Observing plant growth in different soils

Explanation: Observing plant growth in different soils directly demonstrates how soil properties affect life, making it an effective method to explore soil's connection to life.

4) What is a common method for collecting soil samples?

Answer: (None of the options are entirely accurate, but the closest is) A) Using a shovel to dig randomly

Explanation: The correct method involves systematic sampling using tools like shovels, augers, or soil corers from multiple locations and depths, not random digging. However, among the options, using a shovel is the most relevant tool mentioned.

5) How can soil be examined to determine its type?

Answer: A) By its color and texture

Explanation: Soil type is determined by characteristics like color, texture (proportion of sand, silt, and clay), and structure, as these indicate its composition and properties.

6) What does the moisture content of soil refer to?

Answer: B) The amount of water in the soil

Explanation: Moisture content refers to the amount of water present in the soil, which affects plant growth and soil properties.

7) Which process describes the movement of water through soil layers?

Answer: C) Percolation

Explanation: Percolation is the process by which water moves downward through soil layers, influenced by soil texture and structure.

8) What substances are commonly present in soil?

Answer: C) Organic matter, minerals, water, and air

Explanation: Soil is a mixture of organic matter (decomposed plant and animal material), minerals, water, and air, which together support its functions.

9) Which of the following is NOT a factor affecting soil composition?

Answer: D) Atmospheric pressure

Explanation: Soil composition is influenced by climate, topography, and soil pH, along with parent material and time. Atmospheric pressure has minimal direct impact on soil composition.

10) How does soil contribute to food production?

Answer: A) By providing a medium for plant growth

Explanation: Soil supports food production by providing a medium for plant growth, supplying nutrients, water, and physical support for roots.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) Which substances are commonly present in soil?

Answer: A) Water, B) Minerals, C) Organic matter, D) Air

Explanation: Soil consists of water, minerals (from weathered rock), organic matter (decomposed plant and animal material), and air, which occupy pore spaces.

12) When exploring soil and its connection to life, which methods can be used?

Answer: A) Observing plant growth in different soils, B) Conducting experiments in a laboratory, C) Studying soil erosion, D) Analyzing soil acidity

Explanation: All these methods help understand soil's role in supporting life by examining its properties, effects on plants, and environmental interactions.

13) What factors affect soil composition?

Answer: A) Climate, B) Topography, C) Soil pH

Explanation: Climate, topography, and soil pH, along with parent material and time, influence soil composition. Atmospheric pressure (D) is not a significant factor.

Assertion and Reason Type

14) Assertion: Soil serves as a natural filter in water purification processes.

Reason: Soil particles and organic matter trap and degrade pollutants as water percolates through, ensuring clean groundwater.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Soil acts as a natural filter by trapping and degrading pollutants during percolation, which explains why it purifies water.

15) Assertion: Understanding the moisture content of soil is crucial for agricultural practices.

Reason: Soil moisture affects plant water uptake, germination, and growth, influencing crop yield and quality.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Soil moisture is critical for agriculture as it directly impacts plant processes like water uptake and growth, affecting crop yield.

16) Assertion: Percolation rate varies with soil texture.

Reason: Sandy soils have higher percolation rates due to larger particle sizes, while clay soils have lower rates due to smaller particle sizes and higher water retention.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Percolation rate depends on soil texture, with sandy soils allowing faster water movement due to larger particles, and clay soils retaining water due to smaller particles.

Matrix Matching Type

17) Match the following processes with their descriptions:

Answer:

The moisture content of soil – D) Amount of water in the soil

The percolation – A) Movement of water through soil layers

Substances present in soil – C) Components commonly found in soil

Usefulness of soil – E) Importance of soil in various aspects of life

Soil exploration – B) Examination of soil properties

Explanation: Each term is matched with its accurate description based on soil science concepts.

Comprehension Type

18) Questions:

i. What is the purpose of collecting soil samples?

Answer: The purpose of collecting soil samples is to analyse their composition and properties to determine soil type and suitability for purposes like agriculture, construction, or conservation.

Explanation: Collecting samples allows scientists to study soil characteristics and make informed decisions about land use.

ii. What tools are commonly used for collecting soil samples?

Answer: Shovels, augers, or soil corers are commonly used for collecting soil samples.

Explanation: These tools allow for systematic sampling from different depths and locations.

iii. Why is it important to collect samples from multiple locations within a site?

Answer: Collecting samples from multiple locations accounts for variability in soil composition within a site, ensuring accurate representation.

Explanation: Soil properties can vary across a site, so multiple samples provide a comprehensive understanding.

LEARNERS TASK (Page 43 – 46)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Which of the following is a way to conserve soil?

Answer: C) Crop rotation

Explanation: Crop rotation helps conserve soil by maintaining fertility and reducing erosion, unlike overgrazing, deforestation, or urbanization, which degrade soil.

2) What is the primary purpose of examining soil?

Answer: B) To determine its type and properties

Explanation: Examining soil helps identify its type (e.g., sandy, clay) and properties (e.g., pH, texture), which are critical for its use.

3) Which soil component is responsible for holding nutrients and water?

Answer: C) Organic matter

Explanation: Organic matter, such as humus, retains nutrients and water, making them available for plants.

4) What is the significance of percolation in soil?

Answer: A) It filters pollutants from water

Explanation: Percolation allows water to move through soil, filtering pollutants and purifying groundwater.

5) How does soil erosion affect ecosystems?

Answer: C) It disrupts habitats and decreases soil quality

Explanation: Soil erosion removes fertile topsoil, disrupting plant and animal habitats and reducing soil quality.

6) What is a common method for examining soil pH?

Answer: B) Using a pH meter

Explanation: A pH meter provides an accurate measurement of soil acidity or alkalinity, unlike subjective methods like taste or color observation.

7) Which of the following is NOT a function of soil in ecosystems?

Answer: D) Energy production

Explanation: Soil supports nutrient cycling and water storage but does not produce energy. Air purification is indirectly supported through plant growth.

8) How does soil texture affect plant growth?

Answer: B) It influences water retention and drainage

Explanation: Soil texture (sand, silt, clay proportions) affects how much water and nutrients are retained or drained, impacting plant growth.

9) Which type of soil has the highest water retention capacity?

Answer: C) Clay soil

Explanation: Clay soil has small particles that hold water tightly, giving it the highest water retention capacity compared to sandy, loamy, or peaty soils.

10) What is one consequence of soil pollution? Answer: C) Reduced biodiversity **Explanation:** Soil pollution harms microorganisms, plants, and animals, reducing biodiversity, unlike the other options which are not direct consequences.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) How can soil be examined to determine its type?

Answer: A) By its color and texture, D) By its conductivity and pH

Explanation: Soil type is determined by color, texture (sand, silt, clay proportions), and properties like pH and conductivity, which reflect its composition. Taste, smell, temperature, and humidity are less reliable.

12) What methods can be used for collecting soil samples?

Answer: (None of the options fully align with correct methods, but the closest is) A) Using a shovel to dig randomly

Explanation: Proper soil sampling uses tools like shovels, augers, or corers systematically, not randomly or from single locations or riverbeds. Option A is the closest but not ideal.

13) Which processes describe the movement of water through soil layers?

Answer: C) Percolation

Explanation: Percolation is the process of water moving through soil layers. Condensation, evaporation, and precipitation are related to the water cycle but not specific to soil movement.

Assertion and Reason Type

14) Assertion: Soil is crucial for sustaining life on Earth.

Reason: Soil supports plant growth by providing nutrients and anchorage.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Soil's role in sustaining life is primarily due to its support for plant growth through nutrients and anchorage.

15) Assertion: Examining soil helps in understanding its composition and properties.

Reason: Soil examination reveals characteristics such as color, texture, and moisture content, aiding in soil classification and management.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Examining soil provides data on its properties, which helps classify and manage it effectively.

16) Assertion: Exploring soil diversity is essential for ecosystem conservation.

Reason: Different soil types support diverse plant and animal species, contributing to overall ecosystem health and biodiversity.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Soil diversity supports varied ecosystems, making its exploration vital for conservation.

Matrix Matching Type

17) Match the following terms with their descriptions:

Answer:

Soil in our life – C) Importance of soil

Exploring soil and life – D) Studying soil's connection to life

Collecting soil samples – E) Process of gathering soil for analysis

Examining the soil – B) Method for examining soil

What type of soil is it – A) Determines the type of soil

Explanation: Each term is matched with its corresponding description based on its role in soil science.

Comprehension Type

18) Questions:

i. How does soil contribute to agriculture?

Answer: Soil contributes to agriculture by providing a medium for plant growth, supplying essential nutrients, and supporting root anchorage.

Explanation: Soil's fertility and structure are critical for crop production.

ii. What is one way soil helps regulate the Earth's climate?

Answer: Soil helps regulate the Earth's climate by storing carbon dioxide.

Explanation: Soil sequesters carbon, reducing atmospheric CO_2 levels, and supports plants that release oxygen.

iii. Why is soil considered culturally significant?

Answer: Soil is considered culturally significant because it is symbolically linked to fertility, growth, and renewal in many cultures and has been revered as sacred by civilizations.

Explanation: Soil's role in sustaining life gives it cultural and historical importance.

TEACHING TASK (Page 48 – 51)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) What is the primary composition of the O horizon?

Answer: B) Decomposed organic matter

Explanation: The O horizon consists mainly of decomposed organic matter, such as leaf litter and humus.

2) Where do seeds typically germinate and plant roots grow?

Answer: C) A horizon

Explanation: The A horizon, or topsoil, is rich in organic matter and nutrients, making it the primary layer for seed germination and root growth.

3) What is the characteristic feature of the E horizon?

Answer: B) Light colour due to leaching

Explanation: The E horizon is characterized by leaching of minerals and organic matter, resulting in a light colour.

4) What is another name for the B horizon?

Answer: A) Subsoil

Explanation: The B horizon is commonly referred to as subsoil, as it lies below the topsoil and contains leached minerals.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

5) Which horizon of soil is not primarily composed of weathered parent material?

Answer: A) O horizon, B) A horizon

Explanation: The O horizon is primarily organic matter, and the A horizon is a mix of organic matter and minerals. The C horizon is mainly weathered parent material.

6) Which horizon of soil is not commonly referred to as the subsoil?

Answer: A) O horizon, B) A horizon, D) C horizon

Explanation: The B horizon is known as subsoil. The O, A, and C horizons are not referred to as subsoil.

Assertion and Reason Type

7) Assertion: The O horizon is absent in some soils, particularly those in arid regions.

Reasoning: In such areas, the limited organic matter present decomposes rapidly or is carried away by wind or water erosion.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Arid regions lack sufficient vegetation to form an O horizon, and any organic matter decomposes quickly or is eroded.

8) Assertion: Soil horizons are formed solely due to biological activities.

Reasoning: While biological processes contribute significantly to soil formation, factors such as climate, parent material, and time also play crucial roles in horizon development.

Answer: D) Assertion is false, but Reason is true.

Explanation: Soil horizons form due to a combination of biological, physical, and chemical processes, not solely biological activities.

Matrix Matching Type

9) Match the soil horizon with its characteristic:

Answer:

A horizon – C) Rich in organic matter

B horizon – D) Less fertile, contains leached minerals

C horizon – A) Mainly composed of weathered parent material

O horizon – B) Present in some soils, prone to rapid decomposition or erosion

Explanation: Each horizon is matched with its defining characteristic based friction soil profile descriptions.

Comprehension Type

9) Questions:

i. What is another name for the A horizon of soil?

Answer: Topsoil

Explanation: The A horizon is commonly called topsoil due to its position and fertility.

ii. Why is the A horizon important for plant growth?

Answer: The A horizon is important for plant growth because it contains a high concentration of organic matter and nutrients, supporting roots and seed germination.

Explanation: Its nutrient-rich composition makes it ideal for plant growth.

iii. What factors determine the depth of the A horizon?

Answer: Climate, vegetation, and human activities determine the depth of the A horizon.

Explanation: These factors influence organic matter accumulation and soil development.

LEARNERS TASK (Page 50 – 51)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) What type of deposits does the B horizon contain?

Answer: C) Iron, aluminium oxides, and calcium carbonate

Explanation: The B horizon accumulates minerals like iron, aluminium oxides, and calcium carbonate leached from upper layers.

2) Which horizon consists of partially broken-up bedrock?

Answer: B) C horizon

Explanation: The C horizon is composed of weathered parent material, including partially broken-up bedrock.

3) What is the lowest layer of soil profile?

Answer: D) R horizon

Explanation: The R horizon, or bedrock, is the lowest layer in the soil profile.

4) What characterizes the R horizon?

Answer: (Correct answer is not listed; should be "unweathered bedrock")

Explanation: The R horizon is characterized by unweathered bedrock, not the options provided (e.g., decomposed organic matter or partially broken-up bedrock).

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

5) Which of the following is a horizon of soil?

Answer: A) O horizon, B) A horizon, C) C horizon

Explanation: The O, A, and C horizons are standard soil horizons. The P horizon is not a recognized soil horizon.

6) Which horizon of soil does not contain the most organic matter?

Answer: C) B horizon, D) C horizon

Explanation: The O horizon has the most organic matter, followed by the A horizon. The B and C horizons have minimal organic content.

Assertion and Reason Type

7) Assertion: The top layer of soil, known as the A horizon, is rich in organic matter.

Reasoning: This organic matter consists of decomposed plant and animal remains, providing essential nutrients for plant growth.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: The A horizon's organic matter supports plant growth by providing nutrients.

8) Assertion: The B horizon of soil is often referred to as the subsoil.

Reasoning: This layer contains minerals leached from the topsoil, making it less fertile than the A horizon.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: The B horizon is subsoil and less fertile due to leached minerals.

Matrix Matching Type

9) Match the soil horizon with its description:

Answer:

A horizon – B) Top layer rich in organic matter

B horizon – A) Subsoil containing leached minerals

C horizon – D) Layer composed of weathered parent material

O horizon – C) Absent in some soils, rapid decomposition or erosion

Explanation: Each horizon is matched with its accurate description.

Comprehension Type

10) Questions:

i. What are horizons in soil?

Answer: Horizons are distinct layers in the soil profile, each with unique characteristics based on composition and properties.

Explanation: Horizons form due to soil-forming processes and differ in texture, color, and content.

ii. How many horizons are typically found in soil?

Answer: Typically, five horizons (O, A, E, B, C) are found in a soil profile, with the R horizon (bedrock) sometimes included.

Explanation: A complete soil profile may include these horizons, though not all are present in every soil.

iii. Which horizon of soil contains the most organic matter?

Answer: The O horizon contains the most organic matter.

Explanation: The O horizon is primarily composed of decomposed organic material.