TRANSPORT SYSTEM IN PLANTS

TEACHING TASK (Page 68 – 70)

Single Correct Answer MCQs

1. Plants having how many types of tissues to transport.

Answer: A) 2

Explanation: Plants have two types of vascular tissues for transport: xylem and phloem. Xylem transports water and minerals, while phloem transports food (sugars).

2. Xylem conducts

Answer: C) Water and minerals

Explanation: Xylem is responsible for conducting water and dissolved minerals from the roots to other parts of the plant.

3. The plants take in water from the soil through their roots. This water is called

Answer: B) Xylem sap

Explanation: The water absorbed by roots, containing dissolved minerals, is referred to as xylem sap, which is transported through xylem vessels.

4. What is the function of root hairs

Answer: D) Both B & C

Explanation: Root hairs absorb both water and minerals from the soil, increasing the surface area for absorption.

5. Water and minerals absorbed by the root hair by the process of

Answer: C) Osmosis

Explanation: Water is absorbed by root hairs through osmosis, moving from an area of higher water concentration in the soil to lower concentration in the root cells. Minerals are absorbed via active transport or diffusion, but osmosis is the primary process for water.

6. How much percentage of water is used for photosynthesis

Answer: C) 1-2%

Explanation: Only about 1-2% of the water absorbed by plants is used for photosynthesis and other metabolic activities; the rest is lost through transpiration.

7. Excess water is lost by water vapour to the air through

Answer: A) Transpiration

Explanation: Transpiration is the process by which excess water is lost as water vapor through stomata in leaves.

8. Which substances are made in the tips of roots and shoots

Answer: B) Hormones

Explanation: Hormones, such as auxins, are produced in the tips of roots and shoots (apical meristems) to regulate growth and development.

9. Water will be absorbed by root hair when

Answer: A) Concentration of solutes in the cell sap is high

Explanation: Water moves into root hairs via osmosis when the concentration of solutes in the cell sap is higher than in the soil, creating a water potential gradient.

10. Translocation of solutes primarily takes place through

Answer: A) Phloem

Explanation: Translocation refers to the transport of organic solutes (like sugars) from leaves to other parts of the plant, which occurs through phloem.

11. Which of the following carries substances upwards as well as downwards in a plant

Answer: C) Phloem

Explanation: Phloem transports food (sugars) both upwards (e.g., to growing shoots) and downwards (e.g., to roots) in a plant, unlike xylem, which primarily conducts water upwards.

12. Which of the following is a complex permanent tissue

Answer: C) A & B

Explanation: Both xylem and phloem are complex permanent tissues, as they are composed of multiple cell types working together to perform transport functions.

More Than One Answer MCQs

13. Cells of phloem

Answer: C) i, ii, iii

Explanation: Phloem consists of sieve cells, sieve tubes, and companion cells, among other cell types. Sieve cells and sieve tubes are involved in transport, while companion cells support sieve tubes metabolically.

Assertion & Reasoning

14. A: Xylem and phloem are conductive tissue R: These tissues supply the water and minerals and food from one part of the plant to another part respectively.

Answer: A) A and R are true, and R explains A.

Explanation: Assertion is true as xylem and phloem are conductive tissues. The reason explains why, as xylem transports water and minerals, and phloem transports food, moving these substances to different plant parts.

Match the Following

15. Match the following:

Xylem vessels → b. Xylem sap

Root hairs → a. Diffusion

Phloem tissue → d. Sieve tubes

Apical meristem → c. Tip of the stem

Answer: B) 1-b, 2-a, 3-d, 4-c

Explanation:

Xylem vessels transport xylem sap (water and minerals).

Root hairs absorb water primarily through osmosis, but diffusion is involved in mineral uptake.

Phloem tissue contains sieve tubes for food transport.

Apical meristem is located at the tip of the stem and roots for growth.

Comprehensive Questions (Based on Paragraph)

16.

1) Water and minerals salts are absorbed by plants through

Answer: A) Root

Explanation: The paragraph states that water and dissolved minerals (xylem sap) enter from the soil into the root through root hairs.

2) Water and mineral salts are absorbed by root hair is referred to as

Answer: B) Xylem sap

Explanation: The paragraph defines the water containing dissolved minerals as xylem sap.

3) The process by which the root hairs absorb water and mineral salts is called

Answer: C) Both A & B

Explanation: The paragraph mentions water enters root hairs by diffusion and moves from cell to cell by osmosis. Both processes are involved in absorption.

4) Excess water is lost as water vapor through leaves by the process of

Answer: C) Transpiration

Explanation: The paragraph explicitly states that the rest of the water is lost as water vapor through transpiration.

5) The percentage of water used by the plant absorbed for its metabolic activity is

Answer: A) 1-2%

Explanation: The paragraph confirms that 1-2% of water absorbed is used for photosynthesis and other metabolic activities.

LEARNER'S TASK (Page 70 – 72)

Single Correct Answer MCQs

1. Large organisms need transport systems in their bodies to supply

Answer: D) All

Explanation: Large organisms require transport systems to supply food, oxygen, water, and other substances to various parts of the body for survival.

2. What are needed for the transport of substances in plants and animals

Answer: A) Special tissues and organs

Explanation: In plants, vascular tissues (xylem and phloem) and organs like roots and stems facilitate transport. In animals, specialized tissues (e.g., blood vessels) and organs (e.g., heart) are required.

3. Food materials are transferred to

Answer: C) Stem and roots

Explanation: Food materials (sugars) produced in leaves are transported to stems and roots for storage or utilization via phloem.

4. Transport of food from the leaves to other parts of the plant is called

Answer: A) Translocation

Explanation: Translocation is the process of transporting food (sugars) from leaves to other parts of the plant through phloem.

5. The sugar made in leaves is loaded into the sieve tubes of phloem tissue by using energy from

Answer: B) ATP

Explanation: Loading sugars into sieve tubes in phloem requires active transport, which uses energy from ATP.

6. Water absorption through roots can be increased by keeping the potted plants

Answer: C) Under the fan

Explanation: Placing plants under a fan increases transpiration by enhancing air movement, which creates a steeper water potential gradient, promoting water absorption through roots.

7. The phloem tissue in plants is responsible for the transport of

Answer: C) Sugar

Explanation: Phloem primarily transports sugars (food) produced during photosynthesis to other parts of the plant.

8. Movement of water in the plant body takes place through

Answer: A) Xylem

Explanation: Xylem is responsible for the upward movement of water and minerals from roots to other parts of the plant.

9. Prepared food is carried through

Answer: C) Phloem

Explanation: Prepared food (sugars) is transported through phloem tissue.

10. The absorption of water occurs by

Answer: B) Osmosis

Explanation: Water absorption by roots occurs primarily through osmosis, driven by a water potential gradient.

11. The sieve tubes of plants are

Answer: C) Phloem

Explanation: Sieve tubes are a component of phloem tissue, responsible for transporting sugars.

Answer the Questions

12. The transport system in plants consists of two kinds of tissues X & Y.

a) Tissue X, Component A, Component B

Tissue X: Phloem

ii. Component A: Sieve tubes

iii. Component B: Companion cells

Explanation: Tissue X is phloem, made of living cells. Component A (sieve tubes) has tiny pores and contains cytoplasm but no nucleus. Component B (companion cells) has both cytoplasm and a nucleus, supporting sieve tubes.

b) Tissue Y, Component C, Component D

Tissue Y: Xylem

ii. Component C: Xylem vessels

iii. Component D: Tracheids

Explanation: Tissue Y is xylem, made of dead cells. Component C (xylem vessels) has open ends, while Component D (tracheids) does not. In flowering plants, both vessels and tracheids transport water, but in non-flowering plants, tracheids are the primary water-conducting tissue.

More Than One Answer MCQs

13. Which of the following statements is correct

Answer: iii) Only about 1-2% of water is utilized by the plants for photosynthesis.

Explanation:

Incorrect: Hormones are produced in apical meristems, not exclusively at the tips of roots.

ii. Incorrect: Transport of food is called translocation, not transpiration.

iii. Correct: Only 1-2% of water is used for photosynthesis, as confirmed by standard plant physiology.

iv. Incorrect: Phloem is a living conductive tissue with thin walls, not thick walls.

14. Which among the following is incorrect

Answer: iii, iv

Explanation:

Correct: Root hairs absorb water and minerals from the soil.

ii. Correct: Xylem vessels of the root are connected to those in the stem for water transport.

iii. Incorrect: The movement of food through phloem depends on living cells called companion cells, not xylem fibers.

iv. Incorrect: Food movement in phloem requires energy (ATP) for active loading of sugars.

Assertion and Reason

15. A: Transpiration lowers down the plant temperature.

R: Transpiration reduces the concentration of mineral salts.

Answer: C) A is true, R is false.

Explanation: Transpiration helps cool the plant by evaporative cooling (A is true). However, transpiration does not directly reduce the concentration of mineral salts; it primarily involves water loss (R is false).

16. A: Xylem which carries the water and minerals.

R: Phloem which carries the food materials.

Answer: B) A and R are true, and R does not explain A.

Explanation: Both statements are true: xylem carries water and minerals, and phloem carries food. However, the reason (about phloem) does not explain the assertion (about xylem).

17. A: Transport means to carry things from one place to another.

R: The body of every organism is made up of cells.

Answer: B) A and R are true, and R does not explain A.

Explanation: Transport involves moving substances (A is true), and organisms are made of cells (R is true). However, the cellular structure of organisms does not directly explain the transport process.

Match the Following

18. Xylem → c. Conduction of water

Phloem → d. Conduction of food

Stomata → a. Transpiration

Ascent of sap → b. Upward movement of water

Answer: D) 1-c, 2-d, 3-a, 4-b

Explanation:

Xylem conducts water and minerals.

Phloem conducts food (sugars).

Stomata are involved in transpiration (water vapor loss).

Ascent of sap refers to the upward movement of water in xylem.

19. Match the following:

Stomata → b. Transpiration

Xylem → d. Transport of water

Root hairs → a. Absorption of water

Phloem → c. Transport of food

Answer: A) 1-b, 2-d, 3-a, 4-c

Explanation:

Stomata facilitate transpiration.

Xylem transports water and minerals.

Root hairs absorb water (and minerals).

Phloem transports food (sugars).

Single Correct Answer (Additional Questions)

20. Loss of water from the tips of leaves is called

Answer: B) Guttation

Explanation: Guttation is the loss of water in liquid form from the tips of leaves, typically through hydathodes, unlike transpiration, which involves water vapor loss through stomata.

21. Active transport of ions by the cell requires

Answer: B) ATP

Explanation: Active transport of ions (e.g., minerals into root cells) requires energy, which is provided by ATP.

22. Transpiration will increase with the increase of

Answer: B) Temperature

Explanation: Higher temperatures increase the rate of evaporation, thus increasing transpiration. Humidity, CO_2, and SO_2 do not directly increase transpiration.