

L-1 : Transport of Food and Minerals in Plants

Q.G. Short-answer questions :- (Page 12)

Q 1. Name the types of cells that make up the xylem and the phloem.

Ans. The xylem cells are - xylem vessels, tracheids, xylem parenchyma cells and xylem sclerenchyma cells.

The phloem cells are - sieve tubes, companion cells, phloem parenchyma cells and phloem sclerenchyma cells.

Q 2. What is the role of the companion cells in phloem?

Ans. The companion ^{an} cells in phloem help phloem to carry out metabolic processes on behalf of the sieve tube cells.

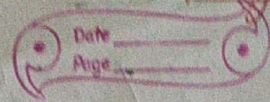
Q 3. Name one example each of the following processes observed in living things.

(i) Diffusion → Eg: The movement of carbon dioxide and oxygen into and out of leaves.

(ii) Osmosis → Eg: The plant roots draw water from the soil by osmosis.

(iii) Active transport → Eg: Essential minerals may be taken into the cell by active transport.

Q 4. How does the special shape of the root hair cells help in water absorption?



Q4. The special shape of the root hair cells increases the surface area of the cell membrane across which water can be absorbed.

Q5. How does transpiration affect the rate of water absorption by the roots?

Ans. As water loss through transpiration is more, the rate of water absorption by the roots will increase.

Q6. Name the factors that affect the rate of transpiration.

Ans. The factors that affect the rate of transpiration are temperature, sunlight, wind & humidity.

Q7. What is the difference in the direction of transport of substances in the xylem and the phloem?

Ans. The transport of water and minerals in the xylem is in only one direction i.e. from roots to the upper parts whereas in the phloem, the movement of food can be in either direction i.e. from leaves to both the upper & lower parts.

Q8. Name the process by which minerals are absorbed in plants.

Ans. The process by which minerals are absorbed in plants is Active transport.

Q9. Can minerals be absorbed from the soil if

(d) Xylem sclerenchyma cells :- They are long, narrow, thick walled dead cells, that taper at the ends. They give support to the plant.

(ii) Phloem → Phloem consists of four types of cells :-

(a) Sieve tubes - Sieve tubes are living cylindrical cells that are placed end to end. These play an important role in the transport of food within the plant.

(b) Companion cells - They are long, thin-walled cells that are associated with the sieve tube cells. They help to carry out metabolic processes on behalf of the sieve tube cells.

(c) Phloem parenchyma cells - These are thin-walled cells that transport and store food. These are usually found near the ends of sieve tubes.

(d) Phloem sclerenchyma cells - These are dead cells that have thick walls. They provide support to the plant.

Q.2: No need to write.

Q.3: Describe the mechanism of water uptake by the roots.

Ans: The process of water uptake by the roots involves the following steps -

(i) Water passes through the cell walls and the cell membrane of root hair cells because they are permeable to water.

- (ii) Due to the continuous movement of water into the root hair cells, the pressure inside the cells increases.
- (iii) Water thus passes from cell to cell, ultimately reaching the xylem. Due to the constant entry of water into the root, a pressure called root pressure is set up inside the xylem.

Q4. Describe an activity to demonstrate that transpiration occurs through the leaves.

Ans. Aim: To demonstrate that transpiration occurs through the leaves.

Materials required: a well-watered potted plant, two transparent plastic bags.

Method: Two branches of the potted plant are selected. All the leaves are removed from one branch. A plastic bag is tied around each branch. The potted plant is left in a well-lit place for few hours.

Observation: The plastic bag tied around the branch with leaves has some droplets of water in it. This is because of transpiration. The other bag with no leaves, does not have any water droplets as no transpiration has taken place in the absence of leaves.

Q5. In what ways is transpiration important to plants?

Ans. Transpiration is important to plants in

the following ways :-

- (i) The evaporation of water from the leaf requires heat which is obtained from the plant itself. Thus, transpiration helps plants to keep cool even on hot days.
- (ii) Transpiration helps to maintain the concentration of the sap. As water is absorbed by the roots, the sap becomes less concentrated. Transpiration removes excess water and thus the concentration of the sap becomes normal.

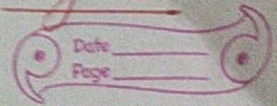
Q6. How is food transported in plants?

Ans. Glucose is synthesised in the leaves during photosynthesis. This glucose has to be sent to other parts of the plant, where it may be broken down to release energy or converted to starch and stored.

This movement of food through the plant is called translocation. It occurs through the phloem and requires energy. It can be in either direction i.e. may take place upwards or downwards depending on the need.

Home Work

1. Read the chap. & do O A, B, C, D, E & F in book.
2. Write O G & O H in your Biology copy & also learn. (given above)
3. Draw these diagrams in your Bio. copy -
(i) Structure of Xylem _X (ii) Structure of Phloem. _X



they are in solid form?

Ans. No, minerals can not be absorbed from the soil if they are in solid form. They can be absorbed only in solution form.

Q. 10. Name three nutrients (elements) that plant require in large quantities apart from those mention in Table 1.2.

Ans. The other nutrients required in large quantities are - carbon, hydrogen and oxygen.

Q.H. Long-answer questions :- (Page 12)

Q. 1. Briefly describe the structure of the following tissues.

(i) Xylem → Xylem consists of four types of cells.

(a) Xylem vessels :- Xylem vessels are long, dead cells placed end to end, resulting in long continuous tubes of cells. The main function is to transport water.

(b) Tracheids :- Tracheids are also long, dead cells with tapering ends, narrower than the xylem vessels. The function is to transport water and also give support to the plant.

(c) Xylem parenchyma cells :- They are thin walled living cells that surround the tracheids and xylem vessels. They help in conducting water and minerals up the stem and also store some substances.