

**SEVENTH- DAY ADVENTIST HR.SEC. SCHOOL
MANINAGAR, AHMEDABAD.**

CLASS VIII BIOLOGY NOTES (2020-21)

CH.1 TRANSPORT OF FOOD AND MINERALS IN PLANTS

CHOOSE THE CORRECT ANSWER

1. The process in plants that require energy is
(activetransport, imbibition, diffusion, osmosis)
2. An example of impermeable membrane is
(cell wall, cell membrane, cellophane , rubber sheet)
3. The loss of water in the form of water vapour is called
(guttation, transpiration , bleeding, translocation)
4. Which of the following is a micronutrient
(nitrogen, phosphorus, sulphur, manganese)
5. A plant cell without nucleus is the
(companion cell, vessel, sieve tube cell, tracheid)
6. The age of the tree is found by counting _____ rings
(phloem, xylem, parenchyma, collenchyma)
7. The surface attraction of water by cell wall is called
(diffusion, imbibition, osmosis, transpiration)
8. The force of attraction between like molecules is called
(adhesion, cohesion, capillary force, suction force)

FILL IN THE BLANKS

- 1) Transpiration helps in cooling the plant body
- 2) The cell wall of root hairs is thin and freely permeable
- 3) If rate of transpiration is more than the rate of absorption of water, wilting of leaves occur
- 4) Xylem carries water from the roots of the leaves

- 5) The roots have root hairs which increase surfacearea for absorption of water
- 6) Rootpressure helps in the ascent of sap
- 7) Transpiration occurs through stomata, lenticels and cuticle
- 8) In leaves, food is manufactured by the process of photosynthesis
- 9) Wilting helps in reducing further loss of water from leaves
- 10) Diffusion of water through semi-permeable membrane is osmosis

NAME THE FOLLOWING

1. Food conducting tissue of plant – **phloem**
2. The living component of xylem-xylem **parenchyma**
3. The other name of bast – **phloem**
4. An element that is regarded both as micro and macronutrient -**iron**
5. The force of attraction between unlike molecules – **adhesion**
6. The process that acts against the concentration gradient – **active transport**
7. An internal factor controlling transpiration – **water content**
8. A process that occurs in any medium -**diffusion**

STATE TRUE OR FALSE

1. Maximum transpiration occurs through the stomata – **True**
2. Cellophane paper is impermeable – **False**
3. Sieve cells are a component of phloem – **True**
4. Sap is transported upwards through the phloem – **False**
5. The cell sap of root hair has higher concentration than soil water – **True**
6. Conduction in plants is a mechanical process – **False**
7. Active transport occurs along the concentration gradient – **False**
8. Lenticels are present on the stem of plants – **True**
9. Phosphorus is a macronutrient – **True**
10. Micronutrients are needed in trace amounts-**True**

MATCH THE FOLLOWING

- | | |
|----------------------------|------------------|
| 1. Water conducting tissue | xylem |
| 2. Food conducting tissue | phloem |
| 3. Absorption of nutrients | active transport |
| 4. Transpiration pull | suction pressure |
| 5. Freely permeable | cell wall |
| 6. Semi-permeable | cell membrane |
| 7. Turgid | stiffness |
| 8. Diffusion | direct contact |
| 9. Wilting | dehydrated |
| 10. Imbibition | dead cells |

ANSWER IN BRIEF

1. What is the importance of water to the plant?

Importance of water to the plant are

- Plants need water for photosynthesis
- Plant cell becomes turgid when filled with water. Turgidity gives stiffness to the cell
- Water is given off as water vapour during transpiration
- Water is used in transporting food from the leaves to all parts of the plant

2. Mention the characteristics of root for absorbing water

- The root hairs and rootlets increase the surface area of absorption of water.
- Water enters the root hair cell as the cell sap of the root hair is at a higher concentration than the surrounding soil water.
- Water enters the root because the cell wall of the root hair is thin and freely permeable.

3. What is the importance of transpiration?

Transpiration helps plants in the following ways

- a) It helps in cooling the plant body
- b) It helps in the ascent of sap
- c) It helps in the distribution of water throughout the plant
- d) It helps in keeping the cells of the plant in turgid condition

4.Explain relation between transpiration and absorption

As water is lost from the plant in the form of water vapour, a vacuum is created and thus a suction force develops. This helps in greater absorption of water by the roots. Thus the rate of transpiration is dependent on the rate of absorption

In cases, where the rate of transpiration is more than the rate of absorption of water, wilting of the leaves occur.

If the leaves remain wilted for a greater length of time then they may die.

Thus absorption is directly related to transpiration.

ANSWER IN DETAIL

1. Explain the methods of absorption of water and mineral salts by root hairs in plants

The root hairs absorb water by three processes 1) imbibitions 2) diffusion 3) osmosis

1. Imbibitions – it is the absorption of water by surface attraction of the living or dead cells
2. Diffusion – it is the free movement of the soil water into the root hairs. This happens because there is more water in the soil than the cell sap of the root hair.
3. Osmosis- it is the diffusion of the water molecules from a region of dilute solution to a region of concentrated solution through a semi-permeable membrane

Absorption of mineral salts by root hairs take place by active transport

4. Active transport – the concentration of the mineral ions is low in the

soil water as compared with the concentration of cell sap inside the root hair cell. So the root cell has to spend energy to take up mineral ions. This process of transport of the ions against the concentration gradient by spending energy is called active transport.

2. What is ascent of sap? Explain forces that contribute to ascent of sap

The water and minerals that have reached the xylem is called sap. The transport of this sap upwards to the leaves is called ascent of sap

There are four forces that contribute to the ascent of sap

1. Root pressure- the process of osmosis and diffusion causes the entry of water and minerals into the root cells from the soil. This builds up a pressure in the xylem vessels which causes the upward movement of the sap to the leaves. This is called root pressure.
2. Adhesion and cohesion forces – water molecules form a continuous column from the root to the leaf due to two forces
 - A) Cohesion force which is attraction between the molecules of water
 - B) Adhesion force which is attraction between the water molecules and the wall of xylem vessels
3. Capillary force – xylem vessels act as narrow capillaries and create a certain force which helps the water to rise to great heights of the stem
4. Transpiration pull – transpiration causes continuous loss of water which creates suction pressure that pulls the sap upwards.

GIVE REASON

- 1. The root cell has to spend energy to take up the mineral ions from soil**

Because the concentration of the mineral ion is low in the soil water as compared with the concentration of cell sap inside the root hair cell

- 2. The rate of transpiration is dependent on the rate of absorption**

Because loss of water due to transpiration creates vacuum which develops a suction force for absorption of water?

3. Iron is a micronutrient but it is often regarded as macronutrient
 Because iron is essential for the process of photosynthesis and in the development of chloroplast

DEFINE

- 1. Transpiration pull-** The loss of water due to transpiration from leaves develops a suction pressure which causes the sap to be pulled up. This is called transpiration pull.
- 2. Root pressure –**The entry of water and minerals into the root from the soil due to osmosis builds up a pressure in xylem vessel. This pressure causes the upward movement of a sap to the leaves. This is called root pressure.

DIFFERENTIATE BETWEEN

Xylem	Phloem
1)water conducting tissue	1)Food conducting tissue
2)consists of dead cells except xylem parenchyma	2)Consists of living cells except phloem fibers
3)Carries sap from the roots upwards to the leaf	3) Carries sap from leaves to all the parts of the plant

Diffusion	Osmosis
1)Occurs when both the substances are in direct contact e.g.Free movement of soil water	1) Occurs through semi permeable membrane e.g.Movement of water molecules
2) Occurs in any medium	2) Occurs in liquid medium

<p>3)It is the movement of all types of substance from higher concentration to lower concentration</p>	<p>3)It is the movement of only solvent molecules from higher to lower concentration.</p>
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Macronutrients	Micronutrient
<p>1)nutrients which are required by plants in large amount are called macronutrients</p>	<p>1) Nutrients which are required by plants intrace amount are called micronutrients</p>
<p>2)e.g K, N, C, Mg</p>	<p>2) e.g Fe, Mn, B,etc.</p>