

Transport in Plants

I. Select the correct answer from the following Questions:

Question 1.

The movement of molecules of solids, liquids and gases from the region of their higher concentration or kinetic energy through semi- permeable membrane to the region of lower concentration or kinetic energy is termed as

- (a) Imbibition
- (b) Diffusion
- (c) Osmosis
- (d) All of these

▼ [Answer](#)

Answer: (b) Diffusion

Question 2.

The phenomenon of absorption of water or any other liquid by the soil particles of a colloidal substance without forming a solution is called

- (a) Imbibition
- (b) Diffusion
- (c) Osmosis
- (d) None of these

▼ [Answer](#)

Answer: (a) Imbibition.

Question 3.

In a fully turgid cell turgor pressure (T.P.) is equal to

- (a) Osmotic pressure
- (b) Diffusion pressure deficit
- (c) Wall pressure
- (d) None of these.

▼ [Answer](#)

Answer: (a) Osmotic pressure.

Question 4.

The contraction of the protoplast due to exosmosis when the cell is placed in hypertonic solution is called

- (a) Deplasmolysis
- (b) Plasmolysis
- (c) Both (a) and (b)
- (d) None of these.

▼ [Answer](#)

Answer: (b) Plasmolysis.

Question 5.

If turgidity of a cell surrounded by water increases, the wall pressure will

- (a) Decrease
- (b) Increase
- (c) Fluctuate
- (d) Remain unchanged.

▼ [Answer](#)

Answer: (b) Increase.

Question 6.

Positive pressure developed in tracheary elements of the root as a result of metabolic activities of the root of plant for pushing the water upwards through xylem into the shoot system is termed

- (a) Diffusion pressure
- (b) Osmotic pressure
- (c) Turgor pressure
- (d) Root pressure.

▼ [Answer](#)

Answer: (d) Root pressure.

Question 7.

Guttation in plants is regulated by

- (a) Humidity
- (b) Availability of water in soil
- (c) Temperature
- (d) All of these.

▼ [Answer](#)

Answer: (d) All of these.

Question 8.

The conducting tissue which takes part in the path of ascent of sap is

- (a) xylem
- (b) phloem
- (c) Both (a) and (b)
- (d) None of these.

▼ [Answer](#)

Answer: (a) xylem.

Question 9.

Water potential in the leaf cells is positive during:

- (a) Guttation
- (b) Low transpiration
- (c) Excessive transpiration
- (d) Excessive absorption.

▼ [Answer](#)

Answer: (d) Excessive absorption.

Question 10.

Stomata are mainly concerned with

- (a) Transpiration
- (b) Gaseous exchange
- (c) Both (a) and (b)
- (d) none of these.

▼ [Answer](#)

Answer: (c) both (a) and (b).

Question 11.

Stomata open during day and close during night under mesophytic conditions in type.

- (a) Leucerne
- (b) Potato
- (c) Cereal
- (d) Barley

▼ [Answer](#)

Answer: (a) Leuceme

Question 12.

Rate of transpiration depends upon

- (a) Increase or decrease of atmospheric temperature
- (b) Increase in light intensity upto certain limit.
- (c) Difference in vapour pressure of intercellular spaces of mesophyll tissue and atmospheric air.
- (d) All of these

▼ [Answer](#)

Answer: (d) All of these.

Question 13.

The direction and rate of water movement from cell to cell is based on:

- (a) Wall pressure
- (b) Turgor pressure
- (c) Incipient plasmolysis
- (d) Diffusion pressure deficit.

▼ [Answer](#)

Answer: (d) Diffusion pressure deficit.

Question 14.

Passive of water from one cell to another is controlled by:

- (a) Wall pressure
- (b) Diffusion pressure deficit
- (c) Hydrostatic pressure
- (d) Osmotic pressure.

▼ [Answer](#)

Answer: (b) Diffusion pressure deficit.

Question 15.

Imbibition involves:

- (a) Capillary
- (b) Diffusion
- (c) Osmosis
- (d) Both (a) and (b)

▼ [Answer](#)

Answer: (d) Both (a) and (b).

Question 16.

Entry of water from soil to xylem is through:

- (a) Gradient of ion concentration
- (b) Gradient of suction pressure
- (c) Gradient of imbibition
- (d) Gradient of turgor pressure.

▼ [Answer](#)

Answer: (b) Gradient of suction pressure.

Question 17.

Plasmolysis occurs due to:

- (a) Osmosis
- (b) Endosmosis
- (c) Exomosis
- (d) Absorption

▼ [Answer](#)

Answer: (c) Exomosis.

Question 18.

Which one of the following helps in holding the leaves position and soft stems to stay erect.

- (a) Transpiration
- (b) Turgidity of cells.
- (c) Rigidity of the cell wall
- (d) stomatal cells.

▼ [Answer](#)

Answer: (b) Turgidity of cells.

Question 19.

Stomata open when the guard cells have:

- (a) Less K⁺
- (b) More K⁺
- (c) More abscisic add
- (d) AH of those.

▼ [Answer](#)

Answer: (b) More K⁺

II. Fill in the blanks

Question 1.

Transport over longer distances proceeds through the vascular system and is called

▼ [Answer](#)

Answer: translocation

Question 2.

..... is very important to plants since it the only means for gaseous movement within the plant body.

▼ [Answer](#)

Answer: Diffusion

Question 3.

Water ehannels-made up of 8 different types of

▼ [Answer](#)

Answer: aquaporins

Question 4.

Water is essential for all activities of the plant and plays a very important role in all living organisms.

▼ [Answer](#)

Answer: physiological

Question 5.

..... and are the two main components that determine water potential.

▼ [Answer](#)

Answer: Solute potential, pressure potential

Question 6.

Pressure potential is usually positive, though in plants negative potential or tension in the water column in the xylem plays a major role in water up a stem.

▼ [Answer](#)

Answer: transport

Question 7.

..... occurs spontaneously in response to a driving force.

▼ [Answer](#)

Answer: Osmosis

Question 8.

If the external solution balances the osmotic pressure of the cytoplasm it is said to be

▼ [Answer](#)

Answer: isotonic

Question 9.

Water and minerals and food are generally moved by a or system.

▼ [Answer](#)

Answer: mass, bulk flow

Question 10.

The movement of water occurs exclusively through the intercellular spaces and the walls of the cells.

▼ [Answer](#)

Answer: apoplastic

Question 11.

The system is the system of interconnected protoplasts.

▼ [Answer](#)

Answer: symplastic

Question 12.

..... can only provide a modest push in the overall process of water transport.

▼ [Answer](#)

Answer: Root pressure

Question 13.
Creates transpiration pull for and of plants.

▼ [Answer](#)

Answer: absorption, transport

Question 14.
Ions are absorbed from the soil by both and transport.

▼ [Answer](#)

Answer: passive, active

Question 15.
Phloem tissue is composed of which form long columns with holes in their end walls called sieve plates

▼ [Answer](#)

Answer: sieve tube cells

III. Mark the statement true (T) or false (F)

Question 1.
Transport over longer distances proceeds through the vascular system (the xylem and the phloem) and is called transpiration.

▼ [Answer](#)

Answer: False.

Question 2.
Diffusion rates are affected by the gradient of concentration, the permeability of the membrane separating them, temperature and pressure.

▼ [Answer](#)

Answer: True.

Question 3.
Some channels are always open; others can be controlled. Some are large, allowing a variety of molecules to cross.

▼ [Answer](#)

Answer: True.

Question 4.
When a molecule moves across a membrane independent of other molecules, the process is called uniport.

▼ [Answer](#)

Answer: True.

Question 5.
A seed may appear dry but it still has water-otherwise it would not be alive and respiring.

▼ [Answer](#)

Answer: True.

Question 6.
Water potential is denoted by the greek symbol psi or ψ and is expressed in pressure units such as pascals (Pa).

▼ [Answer](#)

Answer: True.

Question 7.
Pressure can build up in a plant system when water enters a plant cell due to diffusion causing a pressure build up against the cell wall, it makes the cell turgid; this increases the pressure potential.

▼ [Answer](#)

Answer: True.

Question 8.

The net direction and rate of osmosis depends on both the pressure gradient and concentration gradient.

▼ [Answer](#)

Answer: True.

Question 9.

If the external solution balances the osmotic pressure of the cytoplasm it is said to be hypotonic.

▼ [Answer](#)

Answer: False.

Question 10.

Water diffuses into the cell causing the cytoplasm to build up a pressure against the wall, that is called turgor pressure.

▼ [Answer](#)

Answer: True.

Question 11.

Imbibition is a special type of diffusion when water is absorbed by solids-colloids-causing them to enormously increase in volume.

▼ [Answer](#)

Answer: True.

Question 12.

The symplast is the system of adjacent cell walls that is continuous throughout the plant, except at the apoplast strips of the endodermis in the roots.

▼ [Answer](#)

Answer: False

Question 13.

The cortex is impervious to water because of a band of suberised matrix called the endodermis strip.

► [Answer](#)

Question 14.

Water is transient in plants. Less than 1% of the water reaching the leaves is used in photosynthesis and plant growth.

▼ [Answer](#)

Answer: True.

Question 15.

Surface Tension- attraction of water molecules to polar surfaces (such as the surface of tracheary elements).

▼ [Answer](#)

Answer: False.

IV. Match the items of column I with the items of column II

Column I	Column II
(a) Phloem is responsible for	1. is not dependent on a 'living system'.
(b) Diffusion is a slow process and	2. facilitated diffusion.
(c) In an antiport, they move in	3. transport of food (primarily) sucrose from the source to the sink.
(d) Water potential is a concept	4. opposite directions.
(e) Solute potential and pressure potential	5. are the two main components that determine water potential.
(f) The net direction and rate of	6. fundamental to understanding water movements.
(g) Membrane proteins provide sites at which such molecules cross the membrane.	7. Osmosis depends on both the pressure gradient and concentration gradient.
(h) Cells swell in hypotonic solutions	8. the cytoplasm to build up a pressure against the wall, that is called turgor pressure.
(i) Water diffuses into the cell causing	9. casparian strips of the endodermis in the roots.
(j) The symplastic system is the	10. and shrink in hypertonic ones.

(k) A mycorrhiza is symbiotic	11. a modest push in the overall process of water transport.
(l) Root pressure can at best only provide	12. system of interconnected protoplasts.
(m) In plants capillarity is aided by the direction of movement in the	13. association of a fungus with a root system.
(n) Phloem can be upwards or	14. i.e. bi-directional.
(o) The apoplast is the system of adjacent cell walls that is continuous throughout the plant, except at the	15. the small diameter of the tracheary elements the tracheids and vessel elements

▼ Answer

Answer:

Column I	Column II
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(b) Diffusion is a slow process and	1. is not dependent on a 'living system'.
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