

Transport in Plants

11.1 Means of Transport

- Which of the following is not a feature of active transport of solutes in plants ?
(a) Occurs against concentration gradient
(b) Non-selective
(c) Occurs through membranes
(d) Requires ATP (Odisha NEET 2019)
- Which of the following criteria does not pertain to facilitated transport?
(a) Transport saturation
(b) Uphill transport
(c) Requirement of special membrane proteins
(d) High selectivity (NEET 2013)
- The movement of ions against the concentration gradient will be
(a) active transport (b) osmosis
(c) diffusion (d) all of the above. (2000)

11.2 Plant-Water Relations

- What will be the direction of flow of water when a plant cell is placed in a hypotonic solution ?
(a) Water will flow in both directions.
(b) Water will flow out of the cell.
(c) Water will flow into the cell.
(d) No flow of water in any direction. (Odisha NEET 2019)
- The water potential of pure water is
(a) less than zero
(b) more than zero but less than one
(c) more than one
(d) zero. (NEET 2017)
- Two cells A and B are contiguous. Cell A has osmotic pressure 10 atm, turgor pressure 7 atm and diffusion pressure deficit 3 atm. Cell B has osmotic pressure 8 atm, turgor pressure 3 atm and diffusion pressure deficit 5 atm. The result will be
(a) no movement of water

- (b) equilibrium between the two
(c) movement of water from cell A to B
(d) movement of water from cell B to A. (2007)
- The water potential and osmotic potential of pure water are
(a) 100 and 200 (b) zero and 100
(c) 100 and zero (d) zero and zero. (1998)
- When a cell is fully turgid, which of the following will be zero?
(a) Turgor pressure (b) Water potential
(c) Wall pressure (d) Osmotic pressure (1997)
- With an increase in the turgidity of a cell, the wall pressure will
(a) fluctuate (b) remain unchanged
(c) increase (d) decrease. (1997)
- Water movement between cells is due to
(a) T.P.
(b) W.P.
(c) D.P.D.
(d) incipient plasmolysis. (1992)
- A bottle filled with previously moistened mustard seeds and water was screw capped tightly and kept in a corner. It blew up suddenly after about half an hour. The phenomenon involved is
(a) diffusion (b) imbibition
(c) osmosis (d) DPD. (1990)
- Water potential is equal to
(a) $\Psi_s + O.P$ (b) $\Psi_s = T.P$
(c) $\Psi_p + \Psi_w$ (d) $\Psi_s + \Psi_p$. (1988)

11.3 Long Distance Transport of Water

- The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is
(a) transpiration (b) root pressure
(c) imbibition (d) plasmolysis. (NEET 2020)

14. Xylem translocates
 (a) water, mineral salts, some organic nitrogen and hormones
 (b) water only
 (c) water and mineral salts only
 (d) water, mineral salts and some organic nitrogen only. (NEET 2019)
15. Root pressure develops due to
 (a) passive absorption
 (b) active absorption
 (c) increase in transpiration
 (d) low osmotic potential in soil. (2015)
16. In soil, water available for plants is
 (a) gravitational water
 (b) chemically bound water
 (c) capillary water
 (d) hygroscopic water. (1999)
17. The movement of water, from one cell of cortex to adjacent one in roots, is due to
 (a) accumulation of inorganic salts in the cells
 (b) accumulation of organic compounds in the cells
 (c) water potential gradient
 (d) chemical potential gradient. (1995)
18. Guttation is mainly due to
 (a) root pressure (b) osmosis
 (c) transpiration (d) imbibition. (1992)
19. In soil, the water available for root absorption is
 (a) gravitational water (b) capillary water
 (c) hygroscopic water (d) combined water (1991)
20. The principal pathway of water translocation in angiosperms is
 (a) sieve cells (b) sieve tube elements
 (c) xylem vessel system (d) xylem and phloem. (1990)

11.4 Transpiration

21. Stomatal movement is not affected by
 (a) temperature
 (b) light
 (c) O₂ concentration
 (d) CO₂ concentration. (NEET 2018)
22. Which of the following facilitates opening of stomatal aperture?
 (a) Decrease in turgidity of guard cells
 (b) Radial orientation of cellulose microfibrils in the cell wall of guard cells
 (c) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
 (d) Contraction of outer wall of guard cells (NEET 2017)
23. Water vapour comes out from the plant leaf through the stomatal opening. Through the same

stomatal opening carbon dioxide diffuses into the plant during photosynthesis. Reason out the above statements using one of following options.

- (a) The above processes happen only during night time.
 (b) One process occurs during day time and the other at night.
 (c) Both processes cannot happen simultaneously.
 (d) Both processes can happen together because the diffusion coefficient of water and CO₂ is different. (NEET-I 2016)
24. A column of water within xylem vessels of tall trees does not break under its weight because of
 (a) lignification of xylem vessels
 (b) positive root pressure
 (c) dissolved sugars in water
 (d) tensile strength of water. (2015)
25. Transpiration and root pressure cause water to rise in plants by
 (a) pushing it upward
 (b) pushing and pulling it, respectively
 (c) pulling it upward
 (d) pulling and pushing it, respectively. (2015 Cancelled)
26. Which one gives the most valid and recent explanation for stomatal movement?
 (a) Starch hydrolysis
 (b) Guard cell photosynthesis
 (c) Transpiration
 (d) Potassium influx and efflux (2015 Cancelled)
27. In land plants, the guard cells differ from other epidermal cells in having
 (a) cytoskeleton
 (b) mitochondria
 (c) endoplasmic reticulum
 (d) chloroplasts. (2011)
28. Guttation is the result of
 (a) diffusion (b) transpiration
 (c) osmosis (d) root pressure. (Mains 2011)
29. Guard cells help in
 (a) transpiration
 (b) guttation
 (c) fighting against infection
 (d) protection against grazing. (2009)
30. The rupture and fractionation do not usually occur in the water column in vessel/tracheids during the ascent of sap because of
 (a) weak gravitational pull
 (b) transpiration pull
 (c) lignified thick walls
 (d) cohesion and adhesion. (2008)

31. Potometer works on the principle of
 (a) osmotic pressure
 (b) amount of water absorbed equals the amount transpired
 (c) root pressure
 (d) potential difference between the tip of the tube and that of the plant. (2005)
32. Stomata of a plant open due to
 (a) influx of potassium ions
 (b) efflux of potassium ions
 (c) influx of hydrogen ions
 (d) influx of calcium ions. (2003)
33. Main function of lenticel is
 (a) transpiration (b) guttation
 (c) gaseous exchange (d) bleeding. (2002)
34. Opening and closing of stomata is due to the
 (a) hormonal change in guard cells
 (b) change in turgor pressure of guard cells
 (c) gaseous exchange
 (d) respiration. (2002)
35. Glycolate induces opening of stomata in
 (a) presence of oxygen
 (b) low CO_2 concentration
 (c) high CO_2
 (d) CO_2 absent. (2001)
36. In guard cells when sugar is converted into starch, the stomatal pore
 (a) closes completely (b) opens partially
 (c) opens fully (d) remains unchanged. (1992)
37. At constant temperature, the rate of transpiration will be higher at
 (a) sea level
 (b) 1 km below sea level
 (c) 1 km above sea level
 (d) 1.5 km above sea level. (1992)
38. Conversion of starch to organic acids is required for
 (a) stomatal opening
 (b) stomatal closing
 (c) stomatal formation
 (d) stomatal activity. (1992)
39. In terrestrial habitats, temperature and rainfall conditions are influenced by
 (a) water transformations
 (b) transpiration
 (c) thermoperiodism
 (d) translocation. (1992)
40. Which of the following is used to determine the rate of transpiration in plants?
 (a) Porometer/Hygrometer
 (b) Potometer
 (c) Auxanometer
 (d) Tensiometer/Barometer (1992)
41. The most widely accepted theory for ascent of sap in trees is
 (a) capillarity
 (b) role of atmospheric pressure
 (c) pulsating action of living cell
 (d) transpiration pull and cohesion theory of Dixon and Jolly. (1991)
42. Stomata open and close due to
 (a) circadian rhythm
 (b) genetic clock
 (c) pressure of gases inside the leaves
 (d) turgor pressure of guard cells. (1988)
43. Phenyl mercuric acetate (PMA) results in
 (a) reduced photosynthesis
 (b) reduced transpiration
 (c) reduced respiration
 (d) killing of plants. (1988)
44. Transpiration is least in
 (a) good soil moisture
 (b) high wind velocity
 (c) dry environment
 (d) high atmospheric humidity. (1988)
- ### 11.5 Uptake and Transport of Mineral Nutrients
45. When water enters in roots due to diffusion, is termed as
 (a) osmosis (b) passive absorption
 (c) endocytosis (d) active absorption. (1996)
46. Poisons like cyanide inhibit Na^+ efflux and K^+ influx during cellular transport. This inhibitory effect is reversed by an injection of ATP. This demonstrates that
 (a) ATP is the carrier protein in the transport system
 (b) energy for Na^+ - K^+ exchange pump comes from ATP
 (c) ATP is hydrolysed by ATPase to release energy
 (d) Na^+ - K^+ exchange pump operates in the cell. (1994)
47. Minerals absorbed by root move to the leaf through
 (a) xylem (b) phloem
 (c) sieve tubes (d) none of the above. (1989)
- ### 11.6 Phloem Transport: Flow from Source to Sink
48. What is the direction of movement of sugars in phloem?
 (a) Bi-directional
 (b) Non-multidirectional
 (c) Upward
 (d) Downward (NEET 2019)

- 49.** A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap?
 (a) Acidic
 (b) Alkaline
 (c) Low refractive index
 (d) Absence of sugar (NEET-II 2016)
- 50.** In a ring girdled plant
 (a) the shoot and root die together
 (b) neither root nor shoot will die
 (c) the shoot dies first
 (d) the root dies first. (2015 Cancelled)
- 51.** The translocation of organic solutes in sieve tube members is supported by
 (a) cytoplasmic streaming
 (b) root pressure and transpiration pull
 (c) P-proteins
 (d) mass flow involving a carrier and ATP. (2006)
- 52.** Loading of phloem is related to
 (a) increase of sugar in phloem
 (b) elongation of phloem cell
 (c) separation of phloem parenchyma
 (d) strengthening of phloem fiber. (2001)
- 53.** Bidirectional translocation of solutes takes place in
 (a) parenchyma (b) cambium
 (c) xylem (d) phloem. (1997)
- 54.** Translocation of carbohydrate nutrients usually occurs in the form of
 (a) glucose (b) maltose
 (c) starch (d) sucrose. (1993)
- 55.** Which is correct about transport of conduction of substances?
 (a) Organic food moves up through phloem
 (b) Organic food moves up through xylem
 (c) Inorganic food moves upwardly and downwardly through xylem
 (d) Organic food moves upwardly and downwardly through phloem (1991)
- 56.** Death of protoplasm is a pre-requisite for a vital function like
 (a) transport of sap (b) transport of food
 (c) absorption of water (d) gaseous exchange. (1989)

ANSWER KEY

1. (b) 2. (b) 3. (a) 4. (c) 5. (d) 6. (c) 7. (d) 8. (b) 9. (c) 10. (c)
 11. (b) 12. (d) 13. (b) 14. (a) 15. (b) 16. (c) 17. (c) 18. (a) 19. (b) 20. (c)
 21. (c) 22. (b) 23. (d) 24. (d) 25. (d) 26. (d) 27. (d) 28. (d) 29. (a) 30. (d)
 31. (b) 32. (a) 33. (c) 34. (b) 35. (b) 36. (a) 37. (d) 38. (a) 39. (b) 40. (b)
 41. (d) 42. (d) 43. (b) 44. (d) 45. (b) 46. (b) 47. (a) 48. (a) 49. (b) 50. (d)
 51. (a) 52. (a) 53. (d) 54. (d) 55. (d) 56. (a)