

WATER RELATIONS OF PLANTS

- 1) The path of water from soil in to the xylem of the root is
 - a) Soil → root hair → endodermis → cortex → pericycle → xylem
 - b) Soil → root hair → cortex → endodermis → pericycle → Proto xylem → meta xylem
 - c) Soil → root hair → cortex → endodermis → pericycle → Meta xylem → Proto xylem
 - d) Soil → cortex → root hair → pericycle → Meta xylem → Proto xylem
- 2) The cellulosic cell walls of plant cells are
 - a) Permeable
 - b) Semipermeable
 - c) Impermeable
 - d) Selectively permeable
- 3) In which of the following process semipermeable is involved
 - a) Diffusion
 - b) Osmosis
 - c) Imbibition
 - d) Adsorption
- 4) Root hairs occurs in the zone of
 - a) Cell division
 - b) Cell elongation
 - c) Cell maturation
 - d) Root cap
- 5) Which of the following plant material is an effective imbibiant?
 - a) Agar
 - b) Cellulose
 - c) Lignin
 - d) Pectin
- 6) Turgidity of a cell is necessary for
 - a) Preventing wilting of leaves
 - b) Causing opening of stomata
 - c) Causing cell elongation
 - d) All of these
- 7) If the cell in a solution undergo plasmolysis, the solution must be
 - a) Hypotonic
 - b) Hypertonic
 - c) Isotonic
 - d) Paratonic
- 8) The potential of pure water at atmospheric pressure is regarded as
 - a) Zero
 - b) Less than one
 - c) More than one
 - d) Infinite
- 9) If it was observed that a small slice of potato tissue had lost weight when it was placed in a solution, the reason could be
 - a) Loss of some cells
 - b) Exit of solutes
 - c) Exosmosis
 - d) Loss of cellulose

- 10) Match the following components of column I with values of column II

| | Column I | | Column I |
|---|--|---|-------------------|
| A | Water potential Ψ_w of pure water | p | Generally ignored |
| B | Solute potential, Ψ_s | q | Positive |
| C | Pressure potential Ψ_p | r | Does not exist |
| D | Matric potential Ψ_m | s | Negative |
| | | t | Zero |

- a) A=q, B=t, C=p, D=s
- b) A=t, B=r, C=p, D=q
- c) A=s, B=r, C=p, D=q
- d) A=t, B=s, C=q, D=p

- 11) Fresh grapes shall shrink when they are placed in
 - a) Hot water
 - b) Cold water
 - c) Starch water
 - d) Concentrated salt solution
- 12) In a fully turgid cell
 - a) Ψ_p will be negative and Ψ_s will be positive
 - b) Both Ψ_s and Ψ_p will be positive
 - c) Ψ_s will be negative and Ψ_p will be positive
 - d) Both Ψ_s and Ψ_p will be negative
- 13) Guttation is due to
 - a) Root pressure
 - b) Diffusion
 - c) Imbibition
 - d) Osmosis
- 14) Enzyme which converts starch into sugar is
 - a) Starch hexokinase
 - b) Starch mutase
 - c) Starch dehydrogenase
 - d) Starch phosphorylase
- 15) A wooden peg inserted in a rock causes its breaking during the rainy season. It is due to development of
 - a) Turgor pressure
 - b) Osmotic pressure
 - c) Imbibition pressure
 - d) Plasmolysis
- 16) Endosmosis takes place when plant cell is immersed in
 - a) Isotonic solution
 - b) Hypotonic solution
 - c) Hypertonic solution
 - d) Ultratonic solution
- 17) A water logged soil is physiologically dry because of
 - a) Anaerobic conditions
 - b) Aerobic conditions
 - c) Increased viscosity of water
 - d) Abundance of salts
- 18) Water tightly held to soil particle is
 - a) Gravitational water
 - b) Capillary water
 - c) Hygroscopic water
 - d) Runaway water
- 19) Basic principle for Transpiration-Cohesion tension theory is
 - a) Active absorption
 - b) Active and passive absorption
 - c) Passive absorption
 - d) Apoplastic movement
- 20) Find out a weak water imbibiant from the following group
 - a) Agar
 - b) Cellulose
 - c) Protein
 - d) Starch
- 21) Upward movement of water through xylem is explained by
 - a) Cohesion-Tension theory
 - b) Pulsation theory
 - c) Capillary theory
 - d) Root pressure theory
- 22) Water absorption occurs in the zone of
 - a) Cell division
 - b) Cell elongation
 - c) Cell maturation
 - d) None of these
- 23) A technique for the collection of phloem sap using an aphid stylet was developed by
 - a) Munch
 - b) Moose
 - c) Mittler
 - d) Hall
- 24) Who discovered transpiration as a "Necessary Evil?"
 - a) Burr
 - b) Curtis
 - c) Steward
 - d) Malpighi

- 25) Starch-sugar hypothesis explain about
 - a) Ascent of sap
 - b) Translocation of solutes
 - c) Stomatal movements
 - d) Absorption of water
- 26) Transpiration is maximum in
 - a) Early morning
 - b) Afternoon
 - c) Evening
 - d) Night
- 27) Translocation of sugar in flowering plants occurs in the form of
 - a) Glucose
 - b) Sucrose
 - c) Starch
 - d) Maltose
- 28) Increase in CO₂ concentration inside the leaf would cause
 - a) Closure of stomata
 - b) Opening of stomata
 - c) No effect on stomata
 - d) Widening of stomata
- 29) Which of the following has direct effect on the stomata closure?
 - a) Abscissic acid
 - b) Gibberellins
 - c) Auxin
 - d) Ethylene
- 30) Guttation is the process of exudation of water from plants through
 - a) Stomata
 - b) Hydathodes
 - c) Wounds
 - d) Lenticels
- 31) Stomata open at night and close during day time in
 - a) Epiphytes
 - b) Mesophytes
 - c) Succulents
 - d) Hydrophytes
- 32) The maximum loss of water in transpiration is from
 - a) Lenticels
 - b) Cuticle
 - c) Stomata
 - d) Hydathodes
- 33) Spraying plant surface with phenyl mercuric acetate and silicon emulsion will result in
 - a) Increased photosynthesis
 - b) Increased transpiration
 - c) Decreased transpiration
 - d) Exosmosis
- 34) Opening & closing of stomata are controlled by
 - a) Guard cells
 - b) Epidermal cells
 - c) Mesophyll cells
 - d) Epidermal appendages
- 35) Stomata open & close due to
 - a) Circadian rhythm
 - b) genetic clock
 - c) Pressure of gas inside the leaves
 - d) Turgor pressure of guard cells
- 36) Rate of transpiration higher than rate of water absorption shall cause
 - a) Growth
 - b) Leaf fall
 - c) Wilting
 - d) Death
- 37) In mesophytes, maximum transpiration occurs from
 - a) Stomata
 - b) Cuticle
 - c) Lenticel
 - d) Hydathodes
- 38) Root hair absorbs water from soil through
 - a) Turgor pressure
 - b) Ion exchange
 - c) Osmosis
 - d) Diffusion
- 39) Stomata open when the guard cell become
 - a) Flaccid
 - b) Turgid
 - c) Enucleated
 - d) All of these
- 40) Process of water exudation through hydathodes is called
 - a) Guttation
 - b) Transpiration
 - c) Excretion
 - d) Hydrolysis

- 41) Increased temperature at night results in
 a) Closing of stomata b) Opening of stomata
 c) Partial opening of stomata d) Lose of turgidity of guard cells
- 42) In epistomatic leaf stomata are present
 a) On the dorsal surface b) On the ventral surface
 c) Both the surfaces d) On the middle of the leaf
- 43) In hypostomatic leaf the rate of transpiration is
 a) More from the dorsal surface b) More from the ventral surface
 c) Same from both the surfaces d) occasionally more from the ventral surface
- 44) Sunken stomata help to
 a) Promote transpiration b) Check transpiration
 c) Stop transpiration d) Promote guttation
- 45) Instrument that can be used to demonstrate pull due to vaporization of water is
 a) Osmometer b) Auxanometer
 c) Anemometer d) Potometer
- 46) Cooling of the plant is due to the
 a) Excessive transpiration b) Radiation of heat through transpiring organ
 c) Lowering of atmospheric temperature d) Excessive respiration
- 47) Guttation droplets comprises
 a) Pure water b) Water and various salts dissolved in it
 c) Water and inorganic salts d) Water and organic salts
- 48) Transpiration is due to
 a) Diffusion b) Root pressure c) Osmosis d) Imbibition
- 49) Vein loading refers to
 a) Elongation of phloem cells b) Separation of phloem cells
 c) Strengthening of phloem fibre d) Pouring of sugar into phloem
- 50) Water lost through transpiration is
 a) Pure water b) Rich in organic solutes
 c) Rich in inorganic salts d) Rich in metal ions
- 51) Common between guard cells and mesophyll cells is
 a) Bean shaped b) Differentially thick walls
 c) Presence of chloroplasts d) uniformly thin cell wall
- 52) Guttation occurs when
 a) Wind velocity increase b) Humidity increases
 c) Root pressure is less and transpiration is more
 d) Root pressure is more and transpiration is less

- 53) Choose the correct statement from the following.
- A. The volume of water transpired is approximately equal to the volume of water absorbed.
 - B. The volume of water transpired is more than the volume of water absorbed.
 - a) Statement A is correct
 - b) Statement B is correct
 - c) Both the statements A and B are correct
 - d) Both the statements A and B are wrong
- 54) Most satisfactory explanation for the mechanism of translocation of organic solutes is offered by
- a) Mass flow hypothesis
 - b) Vein loading
 - c) Cell theory
 - d) Vein unloading
- 55) Involvement of phloem in translocation can be proved through
- a) Ringing experiment
 - b) Chemical analysis of sap of sieve tube
 - c) Using radioisotope ^{14}C
 - d) All the three
- 56) Choose the correct statement from the following.
- A. Guttation occurs in herbaceous monocots and dicots during early mornings, in winter.
 - B. Guttation occurs when the rate of water absorption is more than the rate of transpiration.
 - a) Statement A is correct
 - b) Statement B is correct
 - c) Both the statements A and B are correct
 - d) Both the statements A and B are wrong
- 57) Epithem tissue is characteristic of
- a) Hydathodes
 - b) Bark
 - c) Cork
 - d) Lenticels
- 58) The movement of food from supply end to the consumption end within the plant body is called
- a) Transpiration
 - b) Translocation
 - c) Transcription
 - d) Translation
- 59) Which of the following does not cause stomatal opening
- a) Turgor pressure
 - b) Influx of K^+
 - c) Light
 - d) High concentration of CO_2
- 60) Which of the following plants are adapted to check the rate of transpiration?
- a) Epiphytes
 - b) Xerophytes
 - c) Hydrophytes
 - d) Mesophytes
- 61) Stomata close when guard cells become
- a) Turgid
 - b) Flaccid
 - c) Dried up
 - d) Enucleated

- 62) Choose the correct statement from the following.
- A. Guttation droplet is composed of water and various mineral salts dissolved in it.
 - B. Transpired water is composed of water and various mineral salts dissolved in it.
 - a) Statement A is wrong and Statement B is correct
 - b) Statement A is correct and Statement B is wrong
 - c) Both the statements A and B are correct
 - d) Both the statements A and B are wrong
- 63) Which of the following process that occurs in the leaves, lowers their temperature?
- a) Respiration b) Photosynthesis c) Guttation d) Transpiration
- 64) Stomata are characterized by
- a) Kidney shaped guard cells b) Dumbbell shaped guard cells
 - c) Hexagonal shaped guard cells d) Both 1 and 2
- 65) Which of the following stimulates the efflux of K^+ to cause the stomatal close?
- a) Malic acid b) Citric acid
 - c) Fumaric acid d) Oxalo acetic acid
- 66) The guard cell do not show
- a) Vacuole b) Chloroplast c) Cell wall d) Elaioplast
- 67) The reduced transpiration rate in *Opuntia* is due to
- a) Thick cuticle b) Sunken stomata
 - c) Modification of leaves in to spines d) Multilayered epidermis
- 68) Proton transport theory for stomatal movements was given by
- a) Steward b) Levitt c) Hill d) Arnon
- 69) Water will be absorbed by the root hairs when the soil solution is
- a) Hypertonic b) Hypotonic c) Isotonic d) Paratonic
- 70) The most important force which pulls the water up in the plants
- a) Cohesive force b) Adhesive force
 - c) Imbibition force d) Transpiration pull
- 71) The total amount of water available for absorption by plant is
- a) Holard b) Echard c) Chesard d) Ground water
- 72) Guard cells are characterized by
- a) Uniformly thick cell wall b) Thick inner wall and thin outer wall
 - c) Thick outer wall and thin inner wall d) Uniformly thin cell wall
- 73) Munch explained his Mass hypothesis with the help of
- a) Potometer b) Osmometer c) Auxanometer d) Anemometer
- 74) Dry seeds when placed in water swell up due to
- a) Imbibition b) Diffusion c) Osmosis d) Absorption

75) In the diagram of a hydathodes given below, different Parts have been indicated by alphabets. Choose the correct Answer

- a) A=Stomatal chamber, B=Epithem, C=Hydathode, D=Epidermis, E=Vein, F=Intercellular space.
- b) A= Epithem, B= Hydathode,, C= Epidermis D= Vein, E= Intercellular space, F= Stomatal chamber.
- c) A= Hydathode, B= Stomatal chamber, C= Epithem, D= Intercellular space, E= Epidermis, F= Vein.
- d) A= Vein, B= Epidermis, C= Intercellular space, D= Epithem, E= Stomatal chamber, F= Hydathode.

