RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 1 Mins **TRANSPORT IN PLANTS 1** **Marks : 800**

1. Roots play insignificant role in absorption of water in____
   a) Pistia b) Pea c) Wheat d) Sunflower
2. In passive transport across a membrane, when two protein molecules move in opposite direction it is called as
   a) uniport b) antiport c) symport d) co-port
3. Less negative T.P. and first sign of shrinkage of protoplasm of cell is detectable at
   a) Limiting plasmolysis b) Incipient plasmolysis c) Evident plasmolysis
   d) Permanent plasmolysis
4. Rupture and fractionation of water column present in tracheary elements does not occur during ascent of sap due to :
   a) Transpiration pull b) Weak gravitational pull c) Cohesion and adhesion
   d) Lignified thick walls
5. Root system in a plant is well developed_____
   a) due to deficiency of auxins b) due to deficiency of cytokinins
   c) due to deficiency of minerals d) for increased absorption of water
6. Facilitated diffusion
   a) needs a carrier protein
   b) All vertebrates are chordates and all chordates are vertebrates
   c) occurs against the concentration gradient d) occurs against the concentration gradientc
7. The movement of water from one cell of the cortex to the adjacent one in roots is due to_____ .
   a) accumulation of inorganic salts in the cells
   b) accumulation of organic compounds in.the cells c) chemicat potential gradient
   d) water potential gradient
8. Water will move from the root hair through cortex if the water potentials are:

   a)

Root hair	Cortex	Xylem
0	0	0

   b)

Root hair	Cortex	Xylem
-2	-1	0

   c)

Root hair	Cortex	Xylem
0	-1	-2

   d)

Root hair	Cortex	Xylem
0	-1	+2

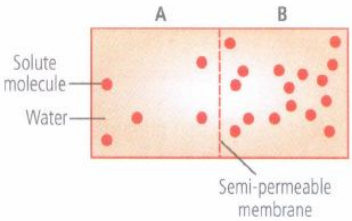
9. The practice of breaking of rocks during rainy season by inserting wooden pegs in them is based on the phenomenon of

a) imbibition pressure b) turgor pressure c) osmotic pressure d) wall pressure

10. Which of the following is an effective adaptation for better gas exchange in plants?
    a) Presence of multiple epidermis b) Presence of hair on the lower epidermis
    c) Presence of waxy cuticle covering the epidermis of the leaves
    d)
    The location of the stomata primarily on the lower surface of the leaf, the side tumed away from the direct sun rays
11. The most important factor for absorption of water in plants is
    a) living cell b) force of capillarity c) imbibition d) cohesive force of water
12. Match column I with column II and select the correct option from the codes given below.

	Column I		**Column II**
A.	Dixon and Jolly	(i)	Root pressure
B.	Stomata	(ii)	Only water available to plants
C.	Manometer	(iii)	Transpiration
D.	Capillary water	(iv)	Transpiration pull
E.	Potometer	(v)	Rate of transpiration

    a) A-(iv), B-(iii), C-(v). D-(ii), E-(i) b) A-(i), B-(iii), C-(iv), D-(ii), E-(v)
    c) A-(iv), B-(iii), C-(i), D-(ii), E-(v) d) A-(v). B-(iv), C-(iii), D-(ii), E-(i)
13. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
    Assertion: More is the number of solute molecules, the lower (more negative) is Ψ_W .
    Reason: Presence of solute particles reduces the free energy of water and thus decreases the water potential.
    a) If both assertion and reason are true and reason is the correct explanation of assertion
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion.
    c) If assertion is true but reason is false. d) If both assertion and reason are false.
14. Based on the figure given below which of the following statements is not correct?



    a) Movement of solvent molecules will take place from chamber A to B.
    b) Movement of solute will take place from A to B.
    c) Presence of a semi-permeable is a pre-requisite for this process to occur.
    d)
    The direction and rate of osmosis depends on both the pressure gradient and concentration gradient.
15. An innovative professor who wanted to give a live demonstration of a physiological process, filled a glass bottle with previously moistened mustard seeds and water. He screwcapped the bottle and kept it away in a corner and resumed his lecture. Towards the end of his lecture

there was a sudden explosion with glass pieces of bottle thrown around.
Which of the following phenomena did the professor want to demonstrate?
a) Diffusion b) Osmosis c) Anaerobic respiration d) Imbibition

16. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
Assertion: The isobilateral leaf has equal number of stomata on both surfaces.
Reason: The dorsiventral leaf has greater number of stomata on upper surface.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

17. Match column I with column II and select the correct option from the codes given below.

	Column I		**Column II**
A.	Vein ending	(i)	Transpiration
B.	Necessary evil	(ii)	Osmosis
C.	Semi-permeable membrane	(iii)	Transpiration pull
D.	Cohesion	(iv)	Guttation
E.	Stomata closure	(v)	ABA

a) A-(iv), B-(i), C-(iii), D-(ii), E-(v) b) A-(iv), B-(i), C-(ii), D-(iii), E-(v)
c) A-(iii), B-(v). C-(i), D-(ii), E-(iv) d) A-(i), B-(ii), C-(iii), D-(iv), E-(v)

18. Ringing/girdling experiments demonstrate
a) phloem is responsible for translocation of food b) xylem is responsible for ascent of sap
c) transpiration pull d) both (a) and (b).

19. 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

20. 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) Imbitiion b) Plasmolysis c) Transpiration d) Root Pressure

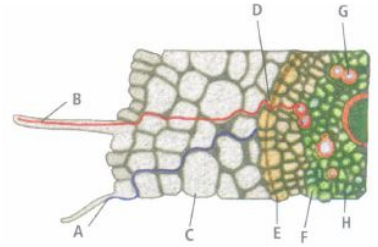
21. Which of the following occupies the space between the cell wall and the shrunken protoplast in a plasmolysed cell?
a) Isotonic solution b) Hypotonic solution c) Hypertonic solution d) Water

22. Which of the following equation is wrong for a normal cell?
a) Ψ_s=-OP b) DPD = OP + TP c) $\Psi_w = \Psi_s + \Psi_p$ d) OP = CRT

23. Water moves up against gravity and even for a tree of 20 m height, the tip receives water within two hours. The most important physiological phenomenon which is responsible for the upward movement of water is _____.
a) guttation b) evaporation c) transpiration d) none of these

24. Organic substances such as sugars are translocated in the phloem. It can be demonstrated by
a) ringing the stem b) root pressure c) grahing d) defoliation.

25. Refer to the given figure. Identify the labelled parts (A-H) and select the correct option.



a)
A - Symplastic path; B - Apoplastic path; C-Cortex: D - Endodermis; E-Casparian strips; F-Pericycle; G - Xylem; H - Phloem
b)
A - Apoplastic path; B - Symplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F-Pericycle; G - Xylem; H - Phloem
c)
A - Apoplastic path; B - Symplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F-Pericycle; G - Phloem; H - Xylem
d)
A - Symplastic path; B - Apoplastic path; C-Cortex; D - Endodermis; E-Casparian strips; F-Pericycle; G - Phloem; H - Xylem

26. Read the given statements and select the correct ones.
(i) A membrane which permits the passage of pure solvent molecules to pass through it and not the solute particles is called semi-permeable.
(ii) A membrane which allows some substances to pass through it more readily than others is known as selectively! differentially permeable.
(iii) All living biological membranes are perfectly semipermeable.
a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

27. Following are the differences between apoplast pathway and symplast pathway.

	Apoplast pathway	**Symplast pathway**
(i)	It consists of nonliving parts of plant body, i.e., cell walls and intercellular spaces.	It consists of living parts of plant body, i.e., protoplasts connected by plasmodesmata.
(ii)	There is little resistance in the movement of water.	Some resistance occurs in the movement of water through symplast.
(iii)	It is slightly slower.	It is faster.
(iv)	Metabolic state of root directly affects apoplast pathway.	Metabolic state of root does not affect symplast pathway.

Which of the given differences is/are incorrect?
a) (iii) only b) (i) and (iii) only c) (iii) and (iv) only d) (ii) and (iii) only

28. The manufactured food in a green plant moves from the leaves to other parts through
a) xylem b) phloem c) cortex d) pith

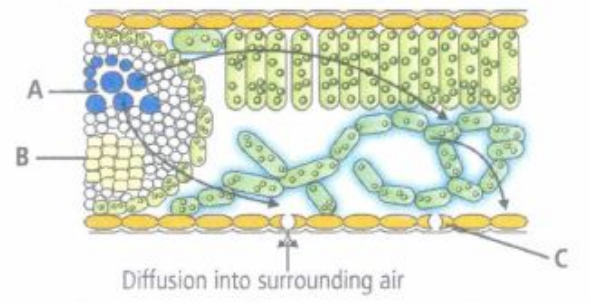
29. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: A plant cell shrinks in hypertonic solution.
Reason: In hypertonic solution, water moves out of the cells due to plasmolysis.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b)
If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reason are false.

30. 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) Absence of sugar b) Acidic c) Alkaline d) Low refractive index
31. Refer to the given figure and select the option which correctly identifies A, B and C.



a)

A	B	C
Xylem	Phloem	Stomatal pore

b)

A	B	C
Phloem	Xylem	Stomatal pore

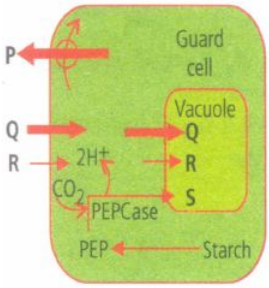
c)

A	B	C
Phloem	Xylem	Guard cell

d)

A	B	C
Xylem	Phloem	Guard cell

32. Unidirectional flow of water, minerals, some organic nitrogen and hormones occurs through
    a) xylem b) phloem c) root d) vascular tissue.
33. The lower surface of leaf will have more number of stomata in a:
    a) dorsiventral leaf b) isobilateral leaf c) both (a) and (b) d) none of these.
34. Which of the following biological membranes is semipermeable?
    a) Fish and animal bladders b) Egg membrane c) Plasma membrane of cell
    d) All of these
35. A girdled plant (upto bast) may survive for some time but it will eventually die, because
    a) water will not move downwards b) water will not move upwards
    c) sugars and other organic materials will not move downwards
    d) sugars and other organic materials will not move upwards.
36. Stomatal opening and closing involves the role of various ions. In the given figure, arrows depict the movement of certain ions during stomatal opening in light. Identify the ions (P, Q, R and S) and select the correct option.



a)

P	Q	R	S
H^+	K^+	Cl^-	$Malate^{2-}$

b)

P	Q	R	S
K^+	H^+	Cl^-	$Malate^{2-}$

c)

P	Q	R	S
H^+	K^+	Cl^-	$Malate^{2-}$

d)

P	Q	R	S
K^+	$Malate^{2-}$	H^+	Cl^-

37. The type of diffusion in which substances move across the membrane along their concentration gradient in the presence of certain carriers or transport proteins is called as
a) simple diffusion b) facilitated diffusion c) osmosis d) active transport.

38. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Mass or bulk flow is the movement of substances in bulk from source to sink as a result of pressure differences.
Reason: Water, minerals and food are generally moved by mass flow.
a) If assertion is true but reason is false. b) If both assertion and reason are false.
c) If both assertion and reason are true and reason is the correct explanation of assertion
d)
If both assertion and reason are true but reason is not the correct explanation of assertion.

39. The given table shows properties of four cells systems A, B, C and D. The maximum rate of inward diffusion of water will be observed in which of these systems?

System	Intracellular concentration of water	Extracellular concentration of water
A	0.09 M	0.11 M
B	0.2 M	0.5 M
C	0.05 M	0.7 M
D	0.03 M	0.6 M

a) System A b) System B c) System C d) System D

40. When water moves through a semi permeable membrane then which of the following pressure develops?
a) O.P b) S.P c) T.P d) W.P

41. Read the given statements and select the correct option.
Statement 1: Xylem transport is unidirectional.
Statement 2: Phloem transport is bi-directional.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

42. What is the direction of movement of sugars in phloem?
a) Upward b) Downward c) Bi-directional d) Non-multidirectional

43. Phloem in gymnosperms lacks_____

a) Sieve tubes only b) Companion cells only c) Both sieve tubes and companion cells d) Albuminous cells and sieve cells

44. Read the given statements and select the correct option.

Statement 1: It becomes difficult to open and shut the wooden doors and windows during rainy season.

Statement 2: Wooden doors and windows imbibe water in rainy season and thus their volume is increased.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

45. Multi-directional flow of a variety of organic and inorganic solutes occurs through

a) xylem b) vascular tissue c) phloem d) root

46. Water potential of a flaccid cell will be:

a) $\Psi_W = \Psi_S$ b) $\Psi_S = \Psi_P$ c) $\Psi_W = 0$ d) $\Psi_W = \Psi_S - \Psi_P$

47. 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) Both processes cannot happen simultaneously

b)

Both processes can happen together because the diffusion coefficient of water and CO_2 is different.

c) The above processes happen only during night time

d) One process occurs during day time, and the other at night.

48. Movement of solvent molecule from a region of its higher concentration to a region of its lower concentration through a semi-permeable membrane, is referred to as

a) simple diffusion b) facilitated diffusion c) osmosis d) active transport.

49. In a terrestrial habitat which of the following is affected by temperature and rainfall condition?

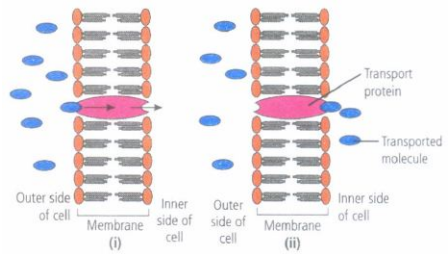
a) Translocation b) Transpiration c) Transformation d) Thermodenaturation

50. The most important function of transpiration in plants is to cause

a) Loss of surplus water b) Cooling of the plant c) Rapid ascent of sap

d) Rapid rise of minerals

51. Refer to the given figure. What does it represent?

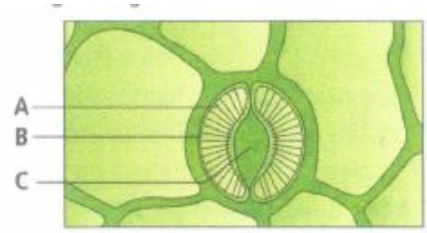


a) Simple diffusion b) Facilitated diffusion c) Osmosis d) Active transport

52. The transpiration-driven ascent of xylem sap depends mainly upon _____ property of water.
a) cohesion b) adhesion c) surface tension d) all of these

53. In succulent plants the stomata opens at night and closes by day. Which of following would be best hypothesis to explain the mechanism of stomata opening at night only?
a) CO_2 used up, increased pH results in accumulation of sugars
b)
CO_2 accumulates, reduces pH stimulates enzymes resulting in accumulation of carbohydrate
c)
Increase in CO_2 concentration, conversion of organic acids in to starch resulting in the increased uptake of potassium ions and water
d)
High CO_2 concentration causes accumulation of organic acids in guard cells resulting in to the increased concentration of cell sap

54. Refer to the given figure.



Select the correct statement regarding the labelled parts A-C.
a) The inner wall of B towards C is thick and elastic.
b) The opening and closing of the stomata is due to change in the turgidity of B.
c) The opening of the stoma is aided due to the orientation of A in the cell walls of B.
d) All of these

55. In a flaccid cell which condition does not occur
a) TP = 0 b) SP = 0 c) WP = 0 d) SP = OP

56. The spraying of phenyl mercuric acetate in leaves_____
a) increases transpiration b) reduces transpiration c) increases rate of photosynthesis
d) causes guttation

57. Which option is true for a fully turgid cell?
a) OP= DPD b) OP= Zero c) DPD= Zero d) TP = Zero

58. In guard cells when sugar is converted into starch the stomatal pore____
a) opens fully b) opens partially c) closes completely d) remains unchanged

59. Osmotic concentration of a cell kept in water is chiefly regulated by:
a) Vacuoles b) Plastids c) Ribosomes d) Mitochondria

60. When transpiration is rapid
a) Ψ_w of epidermal cells decreases b) A negative pressure develops in xylem vessel
c) Water is absorbed through the root passively d) All of these

61. Guard cells help in_____

a) transpiration b) guttation c) fighting against infection d) protection against grazing

62. In the machanism of opening of stomata, the important factor is
a) Turgidity of the guard cells b) Chlorophyll content of the guard cells
c) Hormone content of the subsidiary cells d) Protein content of the epidermal cells

63. Transpiration and root pressure cause water to rise in plants by_____
a) Pulling and pushing it, respectively b) Pushing it upward
c) Pushing and pulling it, respectively d) Pushing it upward

64. Which one of the following structures between two adjacent cells is an effective transport pathway?
a) Plasmalemma b) Plasmodesmata c) Plastoquinone d) Endoplasmic reticulum

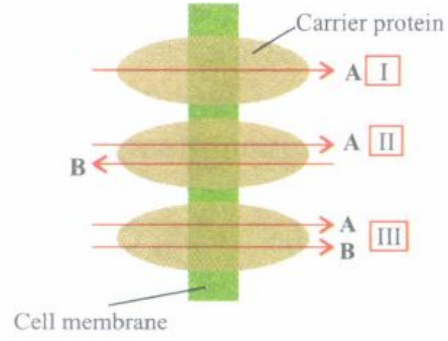
65. Root pressrue develops due to_____
a) Low osmotic potential in soil b) Passive absorption c) Increase in transpiration
d) Active absorption

66. Select the incorrect statement regarding imbibition.
a)
Imbibition is the phenomenon of adsorption of water or any other liquid without forming solution.
b) The liquid which is imbibed is called as imbibate.
c) There occurs a decrease in volume of imbibant during imbibition
d) Water is absorbed by germinating seeds through imbibition.

67. The bulliform cells of leaves lose their turgidity during excessive
a) assimilation b) transpiration c) photosynthesis d) respiration

68. Water moves from a cell with _____ DPD to a cell with _____ DPD.
a) higher, lower b) lower, higher c) lower, lower d) higher, higher

69. The given figure shows transport of two molecules A and B through three different modes of facilitated diffusion. Select the correct option regarding it.



a)

I	II	III
Uniport	Symport	Antiport

b)

I	II	III
Uniport	Antiport	Symport

c)

I	II	III
Antiport	Uniport	Symport

d)

I	II	III
Antiport	Symport	Uniport

70. If the solute is added in the given solution than what observation can be made

a) Its DPD decreases b) It's water potential decreases

c) DPD & water potential remains unchanged d) Its water potential increases

71. The pathway of water from soil upto the secondary xylem
    a) Soil→ root hair→ cortex→ endodermis→ pericycle →protoxylem→ Metaxylem
    b) Metaxylem→protoxylem→pericycle →cortex →endodermis →Soil →root hair
    c) Cortex→ root hair→ → endodermis→ pericycle →protoxylem→ Metaxylem
    d) pericycle→ Soil→ root hair→ cortex→ endodermis→ Protoxylem→ Metaxylem
72. Use of excessive fertilisers causes wilting due to
    a) endosmosis b) exosmosis c) imbibition d) none of these.
73. The plant cell cytoplasm is surrounded by both cell wall and cell membrane. The specificity of transport of substances is mostly across the cell membrane, because
    a) cell membrane is impermeable b) cell membrane is selectively permeable

    c) cell membrane is fully permeable d) cell wall is impermeable
74. Which of the following facilitates opening of stomatal aperture?
    a) Contraction of outer wall of guard cells b) Decrease in turgidity of guard cells
    c) Radial orientation of cellulose microfibrils in the cell wall of guard cells
    d) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
75. Which of the following statements is correct?
    a) Cells shrink in hypertonic solution and swell in hypotonic solution

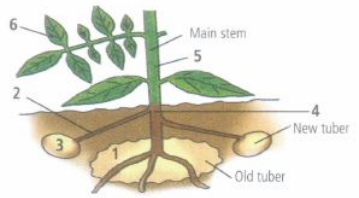
    b) Imbibition is a special type of diffusion when water is absorbed by non living parts.

    c) Most of water flow in the roots occur via the apoplast d) All of these
76. Select the incorrect statement regarding facilitated diffusion.
    a) It is a very specific process b) It is a passive process
    c) It helps the hydrophilic substances to be transported across the membrane
    d) It is faster than active process.
77. Two cells A and B are contiguous. A has OP = 10 atm, TP = 7 atm and DPD = 3 atm. B has OP = 8 atm, TP = 3 atm, DPD = 5 atm. The result would be :
    a) No movement of water b) Equilibrium between the two
    c) Movement of water from A to B d) Movement of water from B to A
78. 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
79. Which of the following is used to determine the rate of transpiration in plants?
    a) Porometer b) potometer c) Auxanometer d) Tensiometer
80. A plasmolysed cell can be deplasmolysed by placing it in
    a) pure water or hypotonic solution b) hypertonic solution c) isotonic solution

    d) saturated solution.
81. The most important factor affecting transpiration is
    a) Light b) Temperature c) Wind d) Atmospheric humidity
82. Which one of the following will not directly affect transpiration?
    a) Temperature b) Light c) Wind speed d) Chlorophyll content of leaves

83. If a cell is placed in a hypertonic solution then y_w of the cell will be
    a) Increased b) Decreased c) Unchanged d) First increases then decreases

84. The given diagram shows a potato plant forming new tubers.
    Which route would be taken by most of the food at this time?



    a) 1 ⟶4⟶ 2⟶3 b) 6⟶5 ⟶2 ⟶3 c) 1⟶4⟶ 5⟶6 d) 6⟶ 5⟶4⟶ 1

85. When the stomata are opening; we observe following changes in the guard cells?
    a) OP increase, TP decreases b) OP & TP increases c) OP decreases, TP increases
    d) OP & TP decreases

86. The water potential of pure water is:
    a) Zero b) Less than zero c) More than zero but less than one d) More than one

87. Uphill transport i.e., movement of substances from their lower concentration to their higher concentration occurs in
    a) simple diffusion b) facilitated diffusion c) active transport d) both (b) and (c).

88. In a fully turgid cell
    a) $\Psi_W = \Psi_S + \Psi_P$ b) $\Psi_W = zero$ c) $\Psi_W - \Psi_S - \Psi_P$ d) $\Psi_W = \Psi_S = \Psi_P$

89. The direction and rate of water movement from cell to cell is based on___
    a) WP b) TP c) DPD d) incipient plasmolysis

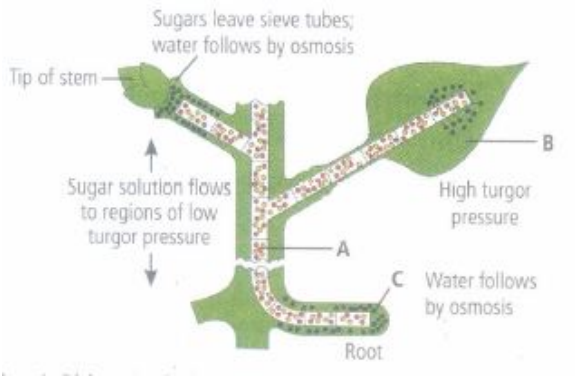
90. Identify the incorrect statement____
    a) Sapwood is the innermost secondary xylem and is lighter in colour.
    b) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour.
    c) Heart wood does not conduct water but gives mechanical support.
    d) Sapwood is involved in conduction of water and minerals from root to leaf

91. Ascent of sap is best explained by
    a) mass (bulk) flow b) pulsation theory c) root pressure
    d) cohesion-tension transpiration pull

92. The concentration of solute in four cells is 0.4 M. They are placed in four separate containers I, II, III and IV, filled with saline water of concentrations 0.1 M, 0.4 M, 2 M and 3M respectively. In which container will the cell swell?
    a) I b) II c) III d) IV

93. Which helps in maintaining form and structure of cells & soft parts of plants?
    a) Osmotic pressure b) Turgor pressure c) Atmospheric pressure d) DPD

94. Refer to the given figure representing mechanism of translocation and select the option which correctly identifies A, B and C.



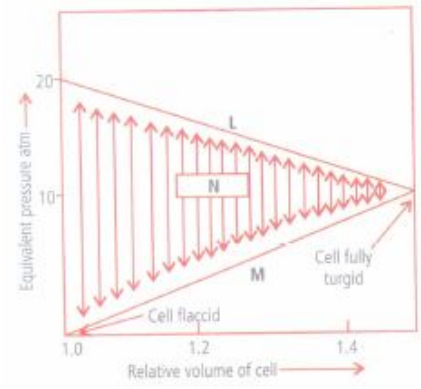
a) A-Phloem; B-Sugars enter sieve tube; C-Sugars leave sieve tube
b) A-Xylem; B-Sugars enter sieve tube; C-Suqars leave sieve tube
c) A-Xylem; B-Sugars leave sieve tube; C-Sugars enter sieve tube
d) A-Phloem; B-Sugars leave sieve tube; C-Sugars enter sieve tube

95. The hydrostatic pressure developed inside the cellon the cell wall due to endosmosis is called
a) osmotic potential b) diffusion pressure c) wall pressure d) turgor pressure

96. The rupture and fractionation do not usually occur in the water column in vessel/tracheids during the ascent of sap because of _____ .
a) lignified thick walls b) cohesion and adhesion c) weak gravitational pull
d) transpiration pull e) rapid turgor pressure changes

97. The osmotic expansion of a cell kept in water is chiefly regulated by:
a) Mitochondria b) Vacuoles c) Plastids d) Ribosomes

98. Given diagram illustrates the changes that occur when a plant cell takes up water. Identify L, M, N and select the incorrect statement regarding the given diagram.



a)
N is the diffusion pressure deficit which becomes zero when L and M are equal in magnitude.
b) In a flaccid cell, value of N becomes equal to that of L.
c) M represents osmotic pressure, which increases when a flaccid cell takes up water.
d) L represents solute potential, which decreases with the increase in turgidity of the cell.

99. Meaningful girdling (ringing) experiment cannot be performed within sugarcone _____
a) its phloern is situated interior to xylem b) its stem surface is covered with waxycoating
c) its vascular bundles are not present in a ring d) its stem is thin

100. Cell wall of plant cell is
a) semi-permeable b) selectively permeable c) fully permeable d) impermeable

101. 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 _____ .
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.

102. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: During apoplastic movement of water, water travels through the cells and their cytoplasm.
Reason: The symplastic movement of water occurs exclusively through the intercellular spaces and the walls of the cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

103. When a plant undergoes senescence, the nutrients may be
a) accumulated b) bound to cell wall c) translocated d) none of these

104. Two adjacent cells A and B are being studied. Cell A has OP of 10 atm and TP of 6 atm. (ell B has OP of 10 atm and TP of 4 atm. Movement of water will occur from:
a) cell A to cell B b) cell B to cell A c) no movement of water d) cannot be determined

105. The form of sugar transported through phloem is
a) glucose b) fructose c) sucrose d) ribose.

106. In _____ pathway, water crosses at least two membranes for each cell in its path (i.e., plasma membrane on entering and exiting).
a) apoplast b) symplast c) transmembrane d) both (a) and (c)

107. The water potential and osmotic potential of pure water are_____
a) 100 and zero b) zero and zero c) 100 and 200 d) zero and 100

108. Which of the following is an example of imbibition?
a) Uptake of water by root hair b) Exchange of gases in stomata
c) Swelling of seed when put in soil d) Opening of stomata

109. Which of the following substance serve as an anti-transpirant in plant?
a) Phenyl mercuric acetate b) Asprin c) Silicon oil d) All of these

110. If cell A with DPD 5 atm is surrounded by many cells with DPD 4 atm then
a) the net movement of water will be from cell A to the surrounding cells
b) the net movement of water will be from cell A to the surrounding cells
c) water will not move at all d) water movement will depend on other unknown factors.

111. If a cell A with DPD = 5 bars is connected to cells B and D, whose OP and TP are respectively 5 and 5, 10 and 4, and 8 and 3, the flow of water will be:
a) C to A B and D b) A and D to B and C c) A to B, C and D d) B to A, C and D.

112. Absorption of water from soil by seeds increases the ____ thus helping seedlings to come out of soil.
a) DPD b) diffusion pressure c) imbibition pressure d) solute potential

113. Mass flow hypothesis was first described by
a) Swanson b) Buchman c) Kursanov d) Munch

114. Read the given statements and select the correct option.
Statement 1: Plant cells do not rupture when placed in distilled water.
Statement 2: Animal cells rupture when placed in distilled water.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

115. When a fresh-water protozoan possessing a contractile vacuole, is placed in a glass containing marine water, the vacuole will____
a) increase in number b) disappear c) increase in size d) decrease in size

116. The translocation of organic solutes in sieve tube members is supported by :
a) Root pressure and transpirational pull b) P-Proteins
c) Mass flow involving a carrier and ATP d) Cytoplasmic streaming

117. Osmotic pressure in the leaf cells is positive during_____
a) excessive transpiration b) low transpirarion c) excessive absorption d) guttation

118. Pressure exerted by cell wall to balance turgor pressure is called
a) wall pressure b) DPD c) water potential d) osmotic pressure.

119. Concentration of minerals in the soil is usually _____ than the concentration of minerals in the root.
a) lower b) higher c) similar d) none of these

120. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The positive pressure that develops in the plant cell due to entry of water is called turgor pressure.
Reason: The turgor pressure is responsible for enlargement and extension during growth of cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

121. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Capillary water is not readily available to the plants as it lies below the level of roots.
Reason: Gravitational water constitutes the only water available to the plants.

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

122. To initiate cell plasmolysis, the salt solution should be
a) isotonic b) hypertonic c) hypotonic d) none of these.

123. Salt is added to preserve meat, pickles, etc. because salting kills bacteria by the process of
a) dissolution b) distillation c) plasmolysis d) imbibition

124. Water potential can be obtained by _____ .
a) OP + TP b) OP = WP c) $\psi_S + \psi_P$ d) OP - DPD

125. Which of the following elements are most readily mobilised?
a) Phosphorus, sulphur, nitrogen and potassium

b) Calcium, sulphur, nitrogen and phosphorus

c) Phosphorus, sulphur, nitrogen and calcium d) Potassium, sulphur, nitrogen and calcium

126. Cohesion-tension theory of "ascent of sap" was given by
a) Godlewski b) Dixon and Jolly c) Tansley d) Sir J.C. Bose

127. Guttation is caused by_____
a) transpiration b) osmosis/DPD c) root pressure d) osmotic pressure

128. In soil, water available for roots (to plants) is_____
a) capillary water b) hygroscopic water c) gravitational water d) chemically bound water

129. If turgidity of a cell surrounded by water increases, the wall pressure will _____ .
a) increase b) decrease c) fluctuate d) remain unchanged

130. Some of the growth regulators affect stomatal opening. Closure of stomata is brought about by_____
a) indole butyric acid b) abscisic acid c) kinetin d) gibberelic acid

131. Match column I with column II and select the correct option from the codes given below.

	Column I		**Column II**
A.	Hypotonic	(i)	No net flow of water
B.	Hypertonic	(ii)	Water moves into the cell
C.	Isotonic	(iii)	Water moves out of the cell

a) A-(ii), B-(iii), C-(i) b) A-(iii), B-(ii), (-(i) c) A-(i), B-(ii), C-(iii) d) A-(ii), B-(i), C-(iii)

132. Specialised epidermal cells surrounding the guard cells are called
a) Complementary cells b) Subsidiary cells c) Bulliform cells d) Lenticels

133. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: The loss of water in its liquid phase from the leaves is called guttation.
Reason: Guttation takes place at night only.
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false. d) If both assertion and reason are false.

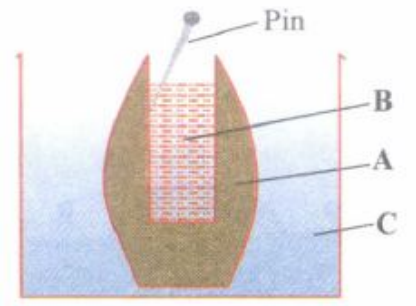
134. Swelling of wooden plants and door-penals during the rainly season is due to
a) Imbibition b) Endosmosis c) Deplasmolysis d) Diffusion

135. Read the given statements and select the correct option.
Statement 1: The process of diffusion does not require any input of energy.
Statement 2: Diffusion involves movement of particles from a region of higher concentration to a region of lower concentration.
a) Both statements 1 and 2 are correct
b) Statement 1 is correct but statement 2 is incorrect
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect

136. Which of the following statements is incorrect?
a) Endodermis is impervious to water due to the presence of suberised Casparian strips.
b) Xylem vessels and tracheids, being non-living, are parts of the apoplast
c) Ascent of sap is best explained by root pressure theory. d) None of these

137. Mainly conduction of water in an angiospenn occurs through_____
a) tracheid b) xylem vessels c) sieve tubes d) All of these

138. The given figure shows set up of potato osmoscope experiment. Select the option that correctly identifies the labels A, B and C.



a)

A	B	C
Peeled potato	Water	Sugar solution

b)

A	B	C
Peeled potato	Sugar solution	Water

c)

A	B	C
Unpeeled potato	Sugar solution	Water

d)

A	B	C
Unpeeled potato	Water	Sugar solution

139. On a warm summer day, the transpiration pull is the main force that drives from root parenchyma into the root xylem. The table shows values of Ψ_P (pressure potential) and Ψ_S (solute potential) in root xylem and root parenchyma, in kPa. In which of the options (a-d) would transpiration pull cause water to move from root parenchyma into the root xylem?

a)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-190	-200	5

b)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
-200	220	65	-5

c)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-220	65	-5

d)

Root parenchyma		Root xylem	
Ψ_P	Ψ_S	Ψ_P	Ψ_S
200	-250	-65	-5

140. Match the followings and choose the correct option.

	Column I		Column II
A.	Leaves	(i)	Anti-transpirant
B	Seed	(ii)	Transpiration
C	Roots	(iii)	Negative osmotic potential

a) A-(ii), B-(iv), C-(v), D-(i). E-(iii) b) A-(iii), B-(ii), C-(iv), D-(i), E-(v)
c) A-(i), B-(ii), C-(iii), D-(iv), E-(v) d) A-(v), B-(iv), C-(iii), D-(ii), E-(i)

141. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Osmosis is a special type of diffusion of water through a semi-permeable membrane.
Reason: The net direction and rate of osmosis depends only on the pressure gradient.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

142. Loss or excretion of water in the form of liquid droplets from the margins and tips of leaves is called
a) transpiration b) guttation c) bleeding d) precipitation

143. In which of the following pathways, movement of water occurs from one cell to another cell through plasmodesmata?
a) Apoplast pathway b) Symplast pathway c) Vacuolar pathway
d) Transmembrane pathway

144. If some solute is dissolved in pure water, its water potential
a) remains same b) increases c) decreases d) first decreases then increases

145. Osmosis is a special kind of diffusion, through which water diffuses across the cell membrane. The rate and direction of osmosis depends upon
a) pressure gradient b) concentration gradient c) both (a) and (b) d) none of these.

146. Which of the following statements does not apply to reverse osmosis?
a) It is used for water purification.
b) In this technique, pressure greater than osmotic pressure is applied to the system
c) It is a passive process. d) It is an active process

147. Active transport

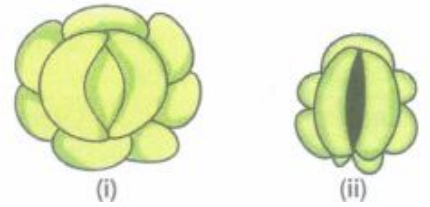
a) uses energy to pump molecules against the concentration gradient

b) is an active process c) is carried out by membrane proteins d) all of these.

148. Amphistomatic leaf, with stomata distributed equally on both the surfaces, is an example of
a) isobilateral leaf b) dorsiventral leaf c) xerophytic leaf d) hydrophytic leaf.

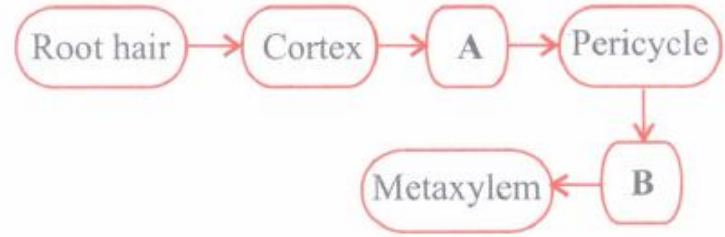
149. Stomata cf a plant open due to_____
a) influx ofcalcium ions b) influx of potassium ions c) efflux of potassium ions
d) influx of hydrogen ions

150. The given figure shows two states of a stomata.



In which of the conditions (i) and (ii), guard cells will have higher water content?
a) (i) only b) (ij) only c) Equal in both d) No water content in both

151. In the given flow chart, the flow of water is shown from soil to xylem of the root. Identify the tissues involved in steps A and B.



a) A - Hypodermis; B - Protoxylem b) A - Medullary rays; B - Phloem
c) A - Endodermis; B - Phloem d) A - Endodermis; B - Protoxylem

152. When water enters into a cell what happens to its OP, TP and DPD?
a) OP & TP increase & its DPD increase b) OP & DPD increase & TP decrease
c) TP & DPD decrease & OP increase d) OP & DPD decrease & TP increase

153. Smaller, lipid soluble molecules diffuse faster through cell membrane, but the movement of hydrophilic substances is facilitated by certain transporters which are chemically
a) proteins b) carbohydrates c) lipids d) phospholipids

154. Stomata in angiosperms open and close due to_____
a) their genetic constitution b) effect of hormones
c) change of turgor pressure in guard cells d) pressure of gases inside the leaves

155. The restoration of turgidity in a plasmolysed cell, when placed in a hypotonic solution is caused by
a) hydration b) electrolysis c) plasmolysis d) deplasmolysis

156. Water passes into a cell due to
a) OP b) DPD c) turgor pressure d) diffusion

157. A column of water within xylem vessels of tall trees does not break under its weight because of___
a) Tensile strength of water b) Lignification of xylem vessels c) Positive root pressure
d) Dissolved sugars in water

158. Read the given statements that refer to different stages of plasmolysis. Select the correct option regarding them.
(i) First stage of plasmolysis,when osmotic concentration of cell sap is just equivalent to that of external solution.
(ii) Protoplast withdraws itself from corners of the cell wall.
(iii) Protoplast gets detached from the cell wall and attains a spherical shape.
a)

(i)	**(ii)**	**(iii)**
Incipient plasmolysis	Limiting plasmolysis	Evident plasmolysis

b)

(i)	**(ii)**	**(iii)**
Limiting plasmolysis	Incipient plasmolysis	Evident' plasmolysis

c)

(i)	**(ii)**	**(iii)**
Limiting plasmolysis	Evident plasmolysis	Incipient plasmolysis

d)

(i)	**(ii)**	**(iii)**
Evident plasmolysis	Incipient plasmolysis	Limiting plasmolysis

159. Movement of the molecules of solids, gases or liquids from the region of their higher concentration to the region of their lower concentration is known as
a) diffusion b) osmosis c) imbibition d) active transport.

160. When transport proteins simultaneously move two molecules across a membrane in the same direction, the process is called
a) uniport b) antiport c) symport d) diffusive port.

161. In apoplast pathway, water moves exclusively through the
a) plasmodesmata b) cell walls c) intercellular spaces d) both (b) and (c).

162. Refer to the given table and select the option that correctly fills the blanks in it.

Property	**Simple diffusion**	**Facilitated transport**	**Active transport**
Highly selective	A	Yes	B
Uphill transport	No	C	Yes
Requires ATP	No	D	Yes

a)

A	**B**	**C**	**D**
No	Yes	No	No

b)

A	**B**	**C**	**D**
Yes	Yes	Yes	No

c)

A	**B**	**C**	**D**
No	No	No	Yes

d)

A	**B**	**C**	**D**
No	Yes	Yes	Yes

163. Osmosis means movement of
a) Solute from low concentration to higher b) Solute from higher concentration to low
c) Solvent from low concentration of solution to higher conc. of solution
d) Solvent from higher concentration solution to low concentration solution

164. In submerged hydrophytes, the absorption of water takes place through
a) root b) stem c) leaf d) general surfaceof plant.

165. Mark the mismatched pair.

a) Amyloplast - Store protein granule b) Elaioplast - Store oils or fats

c) Chloroplasts - Contain chlorophyll pigments

d) Chromoplasts - Contain coloured pigments other than chlorophyll

166. Osmotic pressure depends upon
a) Conc. of solutes b) Temperature c) Ionization of solutes d) All of these

167. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Normally stomata are open in the day time and close during the night.
Reason: The cause of the opening or closing of stomata is the change in the turgidity of the guard cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion

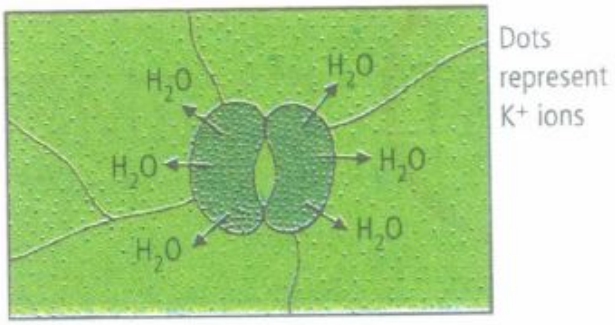
c) If assertion is true but reason is false d) If both assertion and reason are false.

168. Ringing experiment can not be done on a suger cane plant because
a) Its xylem is scanty b) Its pholem is with out phloem parenchyma

c) Its vascular bundles are scttered d) Its phloem is present inside the xylem

169. If a soft stemmed plant is cut horizontally near the base of its stem with a sharp blade-on early morning of a humid day, drops of solution ooze through cut stem. This is due to:
a) guttation b) bleeding c) transpiration pull d) root pressure

170. The given diagram illustrates stomatal closing. The major mistake in the diagram is that



a) the concentration of the K+ should be more outside the guard cells
b) the concentration of the K+ should be equal on both inside and outside
c) the peripheral walls of the guard cellsshould be thicker
d) the water should move inside the guard cells

171. If Ψ_W = water potential; Ψ_S = solute potential; Ψ_P = pressure potential, then select the correct equation showing their inter-relation.
a) $\Psi_W = \Psi_S - \Psi_P$ b) $\Psi_W = \Psi_S + \Psi_P$ c) $\Psi_S = \Psi_W + \Psi_P$ d) $\Psi_W = \Psi_S = \Psi_P$

172. When a plant cell is placed in a hypotonic solution, which of the following will not apply?
a) Wall pressure is decreased b) The cell become turgid

c) Suction pressure of the cell sap will decrease

d) Water potential of the cell sap will increase

173. If the molar concentration of the given sugar solution is 0.3M, find out the osmotic pressure of this solution

a) 6.72 atm b) 67.2 atm c) 2.24 atm d) 5.60 atm

174. A flowering plant is planted in an earthen pot and irrigated. Urea is added in high amounts to make the plant grow faster, but after some time the plant died. This may be due to _____.
a) exosmosis b) endosmosis c) water logging d) suffocation

175. Which one gives the most valid and recent explanation for stomatal movements?
a) Potassium influx and efflux b) Starch hydrolysis c) Guard cell photosynthesis
d) Transpiration

176. The 96% of water absorption in plants is due to
a) Passive absorption b) Active absorption c) Symplastic pathway
d) Mostly active sometimes passive

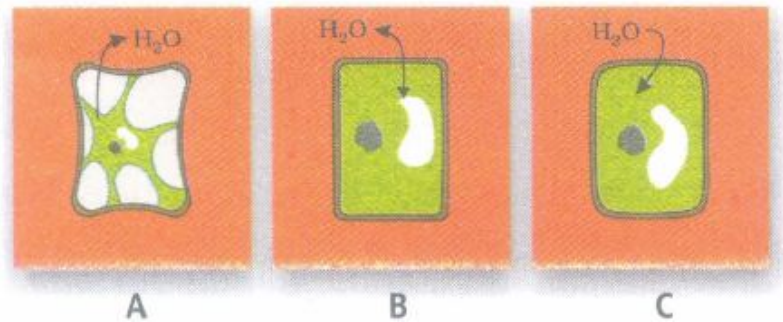
177. Stomatal movement is not affected by :
a) O2 concentration b) light c) Temperature d) CO2 concentration

178. Basis of stomatal opening is_____
a) exosmosis b) endosmosis c) decrease in cell sap concentration
d) plasmolysis of guard cells

179. Passive absorption of water from the soil by the root is mainly effected by
a) Typical tissue organisation b) Respiratory activity of root
c) Tension on cell sap due to tranpiration d) None of the above

180. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: In symport method, both molecules cross the membrane in the same direction at the same time.
Reason: In antiport method, both molecules move in opposite direction.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false d) If both assertion and reason are false.

181. Refer to the given figure and identify cells A, B and C.



a) A - Plasmolysed; B - Flaccid; C - Turgid b) A - Flaccid; B - Turgid; C - Plasmolysed
c) A - Turgid; B - Plasmolysed; C - Flaccid d) A - Turgid; B - Flaccid; C - Plasmolysed

182. Xylem translocates____
a) Water and mineral salts only b) Water, mineral salts and some organic nitrogen only
c) Water, mineral salts, some organic nitrogen and hormones d) Water only

183. Conversion of starch to organic acid is essential for____
a) stomatal closure b) stomatal opening c) stomatal initiatio d) stomatal growth

184. Choose the correct option Mycorrhiza is a symbiotic association of fungus with root system which helps in
A. absorption of water
B. mineral nutrition
C. translocation
D. gaseous exchange
a) Only A b) Only B c) Both A and d) Both B and C

185. The process of diffusion is involved in:
a) respiration b) photosynthesis c) transpiration d) all of these.

186. The cell A has an osmotic potential of -20 bars and a pressure potential of + 6 bars. What will be its water potential?
a) - 20 bars b) - 26 bars c) - 14 bars d) + 14 bars

187. Select the option which correctly satisfies the same relationship.
Stomata: Transpiration: : Hydathode : _____
a) Guttation b) Root pressure c) Bleeding d) Oozing

188. Water entering root due to diffusion is part of_____
a) endosmosis b) osmosis c) passive absorption d) active absorption

189. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Ions are absorbed from the soil by active transport only.
Reason: The proteins present in the membranes of root hair cells passively pump ions from the soil into the cytoplasm of the epidermal cells.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

190. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Cohesion, adhesion and surface tension give high tensile strength to water.
Reason: Capillarity is aided by small diameter of the tracheary elements.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

191. If DPD represents diffusion pressure deficit, OP is the osmotic pressure and TP is the turgor pressure, then which of the following equations is correct?
a) DPD= OP=TP b) DPD= OP +TP c) DPD= OP- TP d) DPD= OP

192. Stomatal movements are influenced by a number of environmental factors. Which of the following statements is/are incorrect regarding this?
(i) Blue light keeps stomata open during the day promoting the movement of K^+ ions into guard

cells.

(ii) Increased CO_2 concentration reduces the pH of guard cells which promotes conversion of sugar into starch, ultimately causing closure of stomata.

(iii) Abscisic acid, under stress conditions, causes rapid movement of K^+ ions into guard cells.

(iv) Highly concentrated sucrose or salt solution when applied over to stomata, results in stomatal opening.

a) (i) and (ii) b) (iii) and (iv) c) (iii) only d) (iv) only

193. The process of guttation takes place

a) when the root pressure is high and the rate of transpiration is low

b) when the root pressure is low and the rate of transpiration is high

c) when the root pressureequalsthe rate of transpiration

d) when the root pressure as well as rate of transpiration are high.

194. Read the following statements and select the correct option.

(i) Pure water has the highest water potential, i.e., zero.

(ii) Process of diffusion does not require any input of energy.

(iii) Water moves from the system containing water at higher water potential to the one having lower water potential.

a) Statements (i) and (ii) are correct. b) Statements (ii) and (iii) are correct.

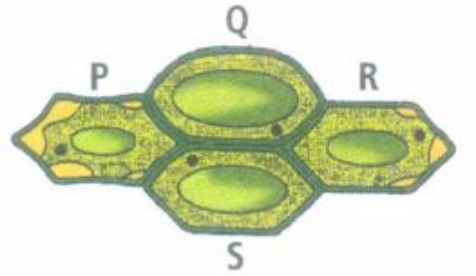
c) Statements (i) and (iii) are correct. d) Statements (i), (ii) and (iii) are correct

195. 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

196. Which out of the four plant cells (P, Q, R and S) would not exhibit any wall pressure?



a) P and Q b) Q and S c) P and R d) R and S

197. Which of the following criterion does not pertain to facilitated transport?

a) High selectivity b) Transport saturation c) Uphill transport

d) requirement of special membrane

198. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: The direction of movement of organic solutes in the phloem is bi-directional.

Reason: The transportation depends on variability of source-sink relationship.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

199. Read the given statements and select the correct option.

Statement 1: Plasmolysis is bursting of cell membrane when a cell is kept in a hypertonic solution.

Statement 2: Hypertonic solution causes endosmosis.

a) Both statements 1 and 2 are correct.

b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct.

d) Both statements 1 and 2 are incorrect.

200. Guttation is the result of:

a) Osmosis b) Root pressure c) Diffusion d) Transpiration