



BIOLOGY

BOOKS - S DINESH & CO BIOLOGY (HINGLISH)

TRANSPORT IN PLANTS

Multiple Choice

1. The membrane that allows some of solute molecules to pass through it and prevent others is called

- A. Permeable membrane
- B. Semipermeable membrane
- C. Selectively or differentially permeable membrane.
- D. Impermeable membrane

Answer: C



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2. The external solution having more concentration than the cell sap is called

- A. Hypertonic solution
- B. Isotonic solution
- C. Hypotonic solution
- D. None of the above

Answer: A



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3. The external solution having same concentration than the cell sap is called

- A. Hypertonic solution

B. Isotonic solution

C. Hypotonic solution

D. None of the above

Answer: B



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4. The external solution having less concentration as that the of cell sap is called

A. Hypertonic solution

B. Isotonic solution

C. Hypotonic solution

D. Ultratonic solution

Answer: C



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5. The Pressure exerted by the swelling protoplast on the walls of the cell

is

- A. Wall pressure
- B. Osmotic pressure
- C. Suction pressure
- D. Turgor pressure .

Answer: D



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6. The pressure exerted by wall of the cell on the protoplast is

- A. W.P.
- B. T.P.
- C. D.P.

D. O.P.

Answer: A



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7. The membrane which allows the solvent molecules to pass through it and not the solute molecules is called

- A. Impermeable membrane
- B. Semipermeable membrane
- C. Permeable membrane
- D. None of the above

Answer: B



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8. Net movement of water is from

- A. Low DPD to high DPD
- B. High DPD to low DPD
- C. DPD gradient plays no role
- D. None of the above

Answer: A



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9. Cell turgidity is caused by

- A. Endosmosis
- B. Exosmosis
- C. Plasmolysis
- D. Diffusion

Answer: A



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10. Which helps in maintaining form and structure of cells

- A. Wall pressure
- B. Turgidity
- C. Atmospheric pressure
- D. D.P.D

Answer: B



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11. Fresh grapes shall shrink when they are placed in

- A. Hot water

B. Cold water

C. Starch water

D. Concentrated salt solution

Answer: D



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12. O.P. of a call can be measured by

A. Manometer

B. Photometer

C. Calorimeter

D. Plasmolysis

Answer: D



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13. O.P. of a solution can be measured by

- A. Photometer
- B. Osmometer
- C. Calorimeter
- D. Plasmolysis

Answer: B



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14. The common material used in demonstrating plasmolysis in the laboratory is

- A. Garden Nasturium
- B. Balsam
- C. Banyan
- D. Tradescantia

Answer: D



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15. A cell with fully elastic wall is placed in hypertonic solution. What will not happen ?

- A. Change in cell size and shape
- B. The whole cell will shrink
- C. Cytoplasm shrinks from the cell wall and undergoes plasmolysis
- D. Decrease in cell size .

Answer: C



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16. Gum swells up in the water due to

A. Imbibition

B. Diffusion

C. Endosmosis

D. Turgidity.

Answer: A



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17. When a cell is placed in 0.25 M concentrated sugar solution, there is no change in it. So the external solution is called

A. Hypertonic

B. Isotonic

C. Hypotonic

D. None of the above

Answer: B

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18. When a cell is placed in 0.25 M concentrated sugar solution, there is no change in it. The concentration of cell sap would be

A. 0.025 M

B. 0.25 M

C. 25 M

D. None of the above

Answer: B

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19. A cell when dipped in 0.5 M sucrose solution has no effect but when the same cell will be dipped in 0.5 M NaCl solution the cell will

A. Decrease in volume

- B. Increase in volume
- C. No change in volume
- D. None of the above

Answer: A

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20. When chemical fertilisers are given to plants, the soil is to be thoroughly watered otherwise the plants get killed because of

- A. Toxic effects of chemical (fertilisers) compounds
- B. Plasmolysis due to high concentration of fertilisers
- C. Failure of physiological process like photosynthesis and respiration
- D. None of the above

Answer: B

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21. The pressure that prevails in cell due to number of substances dissolved in cell sap is

- A. Wall pressure
- B. Turgor pressure
- C. Osmotic pressure
- D. Diffusion pressure.

Answer: C



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22. The selectively permeable membrane of the cell is

- A. Plasmalemma
- B. Cytoplasm
- C. Cell wall

D. None of the above

Answer: A



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23. The plasmolysed cells regain turgidity and assume original volume under influence of hypotonic solution. The process is called

- A. plasmolysis
- B. Deplasmolysis
- C. Endosmosis
- D. Exosmosis

Answer: B



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24. Diffusion pressure deficit is the amount by which two solutions differ in their

A. T.P.

B. O.P

C. D.P.

D. W.P.

Answer: C



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25. In biological system, the term osmosis involves the diffusion of

A. Water

B. Solutes

C. Energy

D. Both A and B.

Answer: A



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

- A. Turgor pressure
- B. Osmotic pressure
- C. Matric potential
- D. Plasmolysis

Answer: C



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27. Endosmosis takes place when a plant cell is immersed in

- A. Isotonic solution
- B. Hypotonic solution
- C. Hypertonic solution
- D. HCL solution.

Answer: B

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28. Imbibition occurs when

- A. Grapes are dipped in saturated solution
- B. Wood is placed in ether
- C. Rubber is dipped in ether
- D. Rubber is dipped in water

Answer: C

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29. A solution of 1.0 M glucose develops a pressure of -27 bars in an oxmometer. What is not correct ?

- A. Pressure potential is -27 bars
- B. Osmotic pressure in 27 bars
- C. Osmotic potential is -27 bars
- D. Solute potential is -27 bars

Answer: A



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30. 1 gm molar solution is

- A. 1 gm mole of solute dissolved in 1000 ml of solvent
- B. 1 mole of solute dissolved in 1000 ml of solution
- C. 1 gm of solute dissolved in 1000 ml of solvent

D. 1 gm of solute dissolved in 1000 ml of solvent

Answer: B



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31. An animal cell placed in pure water will

- A. Swell up and burst
- B. Shrink and die
- C. Shrink and undergo Plasmolysis
- D. Swell up and develop turgidity

Answer: A



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32. Osmotic potential of pure water is

A. One

B. Zero

C. Less than Zero

D. Between zero and one .

Answer: B



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33. A plant cell placed in water will

A. Swell up and become turgid

B. Swell up and burst

C. Lose water and become flaccid

D. Shrink and die.

Answer: A



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34. Water potential is the sum of opposing forces of

- A. Osmotic pressure and diffusion potential deficit
- B. Solute potential and osmotic potential
- C. Solute potential and pressure potential
- D. Diffusion pressure deficit and turgor pressure

Answer: C



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35. Passage of water across a selectively permeable membrane is

- A. Active transport
- B. Pinocytosis
- C. Facilitated diffusion

D. Osmosis.

Answer: D



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36. Land plants grow in soils which possess an osmotic concentration

- A. Hypotonic in relation to cells
- B. Hypertonic in relation to cells
- C. Isotonic in relation to cells
- D. ultratonic in relation to cells .

Answer: A



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37. What will happen when pollen grain is placed in water ?

- A. It will germinate and produce a pollen tube
- B. The pollen grain does not germinate
- C. The pollen grain swells up but bursts at places without forming a pollen tube
- D. The pollen grain forms a number of pollen tubes

Answer: C



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38. In thistle funnel experiment, entry of water into thistle funnel stops after some time automatically due to

- A. Diffusion of sugar out of thistle funnel
- B. External and internal solutions become isotonic
- C. Development of hydrostatic pressure in the thistle funnel
- D. Development of hydrostatic pressure in the beaker.

Answer: C



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39. Seeds placed in water imbibe the same because of

A. Exosmosis

B. Higher Ψ_w

C. Lower Ψ_w

D. Pressure of vacuoles

Answer: C



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40. Potometers are made on the principle that

- A. The amount of water transpired is approximately equal to amount of water absorbed
- B. The amount of water transpired is more than the amount of water absorbed
- C. The amount of water transpired is less than the amount of water absorbed
- D. Humidity causes reduction in transpiration.

Answer: A



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41. The process in which loss of water occurs in the form of water vapour is

- A. Respiration
- B. Guttation

C. Transpiration

D. Exosmosis

Answer: C



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42. Stomatal aperture is surrounded by guard cells and widens (opens) when guard cells are

A. Flaccid

B. Turgid

C. Bean shaped

D. Dumb-bell shaped .

Answer: B



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43. The stomatal are celled sunken when

- A. Guard cells are in the line with epidermal cells
- B. Guard cells are situated below epidermal cells
- C. Guard cells are situated above epidermal cells
- D. Guard cells occur in lower epidermal

Answer: B



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44. Transpiration is high under

- A. Dry environment
- B. Low atmospheric pressure
- C. High temperature
- D. All the above

Answer: D



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45. Sunken stomate

- A. Increase transpiration
- B. Decrease tranpiration
- C. Hinder transpiration
- D. Stop transpiration

Answer: B



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46. Stomatal frequency indicates

- A. Number of stomata per unit area

- B. Rate of water loss
- C. Rate of gaseous exchange
- D. Width of stomatal aperture.

Answer: A



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47. In dorsiventral leaf, the number of stomata per unit area are

- A. More on upper surface
- B. More on lower surface (epidermis)
- C. More on upper surface (epidermis)
- D. Absent on upper surface (epidermis)

Answer: B



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48. In isobilateral leaf, the number of stomata per unit area are

- A. More on upper surface
- B. More on lower surface
- C. Approximately same on both the surfaces
- D. Absent on upper surface

Answer: C



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49. In xerophytic leaf the stomate are situated

- A. On both surfaces
- B. On upper surface
- C. On lower surface
- D. Absent from both surfaces

Answer: C



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50. The loss of water in the form of water drops is called

- A. Transpiration
- B. Respiration
- C. Guttation
- D. Exosmosis

Answer: C



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51. Guttation is form

- A. Uninjured edges of leaves near vein endings

B. Epidermal layers of leaf surfaces

C. Injured edges of leaves

D. None of the above

Answer: A



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52. Transpiration is unavoidable evil because of

A. Structure of leaf and harmful effect

B. Beneficial and harmful effect

C. Maintenance of turgidity for growth

D. Gaseous exchange for photosynthesis and respiration

Answer: D



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53. Drooping of leaves due to loss of turgor at noon but recovery in the evening is referred to as

- A. Temporary wilting
- B. Incipient wilting
- C. Permanent wilting
- D. Midday desiccation

Answer: A



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54. Loss of water by cells without external sign of leaf drooping is called

- A. Temporary wilting
- B. Nascent wilting
- C. Incipient wilting
- D. Permanent wilting.

Answer: C



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55. Plants with scotoactive stomate perform

- A. C₄ photosynthesis
- B. CAM photosynthesis
- C. C₃ photosynthesis
- D. Anoxygenic photosynthesis.

Answer: B



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56. Day time loss of water in the vapour form from stomata is a trade off for intake of

A. Minerals

B. Oxygen

C. Carbon dioxide

D. Energy

Answer: C



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57. For keeping stomata open, besides K ions the guard cells require a constant supply of

A. ABA

B. ATP

C. Organic acids

D. Protons

Answer: B

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58. Presence of stomata on the under surface of dorsiventral leaf is a mechanism of

- A. Reduction in transpiration
- B. Protection from dust
- C. Proper regulation of transpiration
- D. Increase in transpiration

Answer: A

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59. An antitranspirant is

- A. Phenyl mercuric acid
- B. Abscisic acid

C. Salicylic acid

D. All the above

Answer: D



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60. Transpiration is a process related to

A. Osmosis

B. Diffusion

C. Activated transport

D. Facilitated diffusin

Answer: B



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61. Presence of hair on the leaf surface

- A. Reduces transpiration
- B. Increases transpiration
- C. Helps in rapid exchange of gases
- D. Prevents guttation

Answer: A



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62. Some plants possess modifications like phyllodes, scale leaves, etc. for

- A. Differentiation and evolution
- B. Decreasing transpiration
- C. Increasing transpiration
- D. Storage of absorbed water

Answer: B



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63. Rate of transpiration is inversely related to

- A. Humidity
- B. Light
- C. Temperature
- D. Water

Answer: A



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64. Which of the following shows guttation ?

- A. *Pisum sativum*

B. *Ficus bengalensis*

C. *Acacia nilotica*

D. *Tropaeolum*

Answer: D



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65. Plants exhibit subepidermal evaporation of water during

A. Photosynthesis

B. Guttation

C. Transpiration

D. Respiration

Answer: C



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66. Of the following four dorsiventral leaves which will show the maximum loss of weight

- A. Smearred with vaseline on both surfaces
- B. Smearred with vaseline on the upper surface
- C. Smearred with vaseline on the lower surface
- D. Unsmearred

Answer: D



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67. Starch degradation activity of enzyme phosphorylase increases under

- A. High pH
- B. Low pH
- C. Neutral medium
- D. Not connected with pH.

Answer: A



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68. Scotoactive movement of stomata is that

- A. Stomata open at night
- B. Stomata open during day
- C. Stomata close at night
- D. Stomata open both during day and night .

Answer: A



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69. Presently which view is considered best for turgor changes in guard cells

- A. Photosynthesis of chloroplasts in guard cells
- B. Starch is converted into suger in guard cells
- C. Starch is converted into glucose in guard cells
- D. Potassium is transported into guard cells.

Answer: D

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70. Guttational drop comprises

- A. Simple water
- B. Water and various salts dissolved in it
- C. Water and inorganic salts
- D. Water and organic salts.

Answer: B

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71. Cobalt chloride method for demonstration of transpiration was first used by

A. Freemenn

B. Stahl

C. Darwin

D. Ganong

Answer: B



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72. Porometer was developed by

A. Darwin

B. Freeman

C. Livingston

D. Ganong

Answer: A



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73. A leafy shoot is enclosed air tightly in a flask. The flask become moist on the inner surface due to

- A. Guttation
- B. Evaporation
- C. Transpiration
- D. Cooling effect

Answer: C



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74. The most effective light for stomatal opening is

- A. Yellow
- B. Green
- C. Red
- D. Blue

Answer: D



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75. According to Lloyd, the opening and closing of stomata is governed by

- A. K^+ ion influx and efflux
- B. Change in pH
- C. Starch Sugar interconversion
- D. Photosynthetic activity of guard cell chloroplasts

Answer: C



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76. Who proposed that opening and closing of stomata is connected with the change in pH of guard cells

A. Lloyd

B. Von Mohl

C. Sayre/Scarath

D. Levitt

Answer: C



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77. Stomata remain open when relative haumidiy is

A. Above 70%

B. 50%-70%

C. 30%-50%

D. Below 30%

Answer: A



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78. Stamata close at relative humidity of

A. 60%-70%

B. 50%-60%

C. 50%-70%

D. Less than 50%

Answer: D



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79. Transpiration efficiency/transpiration ration is

- A. Water absorbed to water transpired
- B. Unit weight of dry matter synthesised in relation to units of water transpired by the plant
- C. Unit weight of dry matter in realtion to water consumed
- D. Unit weight of water transpired to unit weight of dry matter synthesised

Answer: D



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80. A mesophytic plant growing in well watered soil shows decreased transpiration in the afternoon due to

- A. Closure of many stomata

- B. Contraction of cuticle
- C. Less water availability from soil
- D. High rate of photosynthesis

Answer: A



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81. During high wind velocity, the stomata

- A. Open more widely
- B. Close down
- C. Remain unaffected
- D. Remain unaffected but lose more water due to mass action

Answer: B



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82. Which of the following hypostomatous leaves would dry up last

- A. Both surfaces greased
- B. Both surfaces ungreased
- C. Lower surfaces greased
- D. Upper surfaces greased

Answer: A



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83. In majority of plant, the guard cells are

- A. Dumb-bell shaped
- B. Reniform
- C. Rounded
- D. Polygonal

Answer: B



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84. Dumb-ball shaped guard cells are found in

- A. Gymnosperms
- B. Most dicots
- C. Cereals
- D. Xerophytes

Answer: C



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85. Cobalt chloride is blue in dry state. In contact with moisture, it turns

- A. Yellow

B. Pink

C. Red

D. Green

Answer: B



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86. The maximum absorption of water by roots occurs in the (region) zone of

A. Root cap

B. Cell division

C. Cell elongation

D. Root hairs

Answer: C



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87. The phenomenon of absorption of water that depends on water loss from aerial parts of plant (Transpiration) is

- A. Active absorption
- B. Passive absorption
- C. Both passive and active absorption
- D. None of the above

Answer: B



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88. The metabolic activities of root cells are the main cause of water absorption in

- A. Passive absorption
- B. Active absorption

C. Both passive and active absorption

D. None of the above

Answer: B



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89. The movement of water is along

A. Turgor gradient

B. DPD gradient

C. Diffusion gradient

D. Osmotic gradient

Answer: B



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90. The energy is required in absorption of water in

- A. Active absorption
- B. Passive absorption
- C. Both passive and active absorption
- D. None of the above

Answer: A



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91. The most dominant role in the absorption of water is that of

- A. Active absorption
- B. Passive absorption
- C. Both passive and active absorption
- D. None of the above

Answer: B



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92. No energy is required and roots play only the role of absorbing organs in

- A. Passive absorption
- B. Active absorption
- C. Both passive and active absorption
- D. None of the above

Answer: A



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93. The absorption of water is not affected when

A. Soil is water logged (poorly areated)

B. Soil temperature increases

C. Soil solutionis highly concentrated

D. Soil water is available in maximum

Answer: D



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94. The terms active water absorption and passive water absorption were gives by

A. Renner

B. Atkins

C. Priestley

D. Kramer

Answer: A

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95. For absorption of water, the root hairs act as

- A. Sucking organs
- B. Osmotic system
- C. Manometer
- D. Anemometer

Answer: B

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96. Optimim temperature for water absorption is

- A. $0^{\circ} - 5^{\circ} C$
- B. $5^{\circ} - 20^{\circ} C$
- C. $20^{\circ} - 25^{\circ} C$

D. $40^{\circ} - 50^{\circ} C$

Answer: C



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97. At $0^{\circ}C$ soil temperature the rate of water absorption

- A. Increases
- B. Non affected
- C. Decreases
- D. Appreciable

Answer: C



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98. As absorbed water passes towards vascular cylinder, it must enter the cytoplasm of

- A. Pericycle cells
- B. Endodermal cells
- C. Cortical cells
- D. Xylem parenchyma.

Answer: B



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99. A living continuum of cells connected by plasmodesmata is

- A. Dermal tissue
- B. Ground complex
- C. Donnan free space
- D. Symplast.

Answer: D



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100. A nonliving continuum of cells walls and intercellular spaces is

- A. Ground complex
- B. Alburnum
- C. Apoplast
- D. Desmotubule

Answer: C



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101. A water-logged soil is physiologically dry because of

- A. Anaerobic conditions

B. Nonmovement of water capillaries

C. Increased viscosity of water

D. Abundance of salts

Answer: A



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102. Water tightly held to soil particles is

A. Bound water

B. Hygroscopic water

C. Runaway water

D.

Answer: B



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103. At field capacity the soil contains

- A. Capillary and gravitational water
- B. Capillary and runaway water
- C. Capillary and hygroscopic water
- D. Capillary, hygroscopic and bound water

Answer: D



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104. The phenomenon which forces water upwards into tracheary elements of xylem in the root region is

- A. Transpiration
- B. Root pressure
- C. Turgor pressure
- D. Imbibition pressure

Answer: B



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105. Root pressure may be caused by

- A. Osmotic flow of water into xylem of absorbing part of root
- B. Loss of water from xylem of plant due to transpiration
- C. Low water potential of leaves
- D. High water potential of leaves

Answer: C



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106. The osmotic theory of active water absorption was first given by

- A. Kramer (1941)

B. Eaton (1943)

C. Atkins(1916)

D. Priestley (1923)

Answer: D



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107. The lowest water potential is found in the xylem channels of

A. Stem

B. Root

C. Root in the root hair zone

D. Leaves.

Answer: A



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108. Contribution of passive water absorption to total water absorption is

- A. 50 %
- B. 70 %
- C. 80 – 90 %
- D. 96 – 100 %

Answer: C



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109. Force for passive water absorption develops in

- A. Xylem
- B. Aerial parts
- C. Root
- D. Root hairs

Answer: B



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110. Force for active water absorption is present in

- A. Xylem
- B. Aerial parts
- C. Root
- D. Root hairs

Answer: C



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111. Rate of water absorption generally follows closely the rate of

- A. Transpiration

B. Photosynthesis

C. Respiration

D. Growth

Answer: A



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112. The phenomenon related to active water absorption is

A. Transpiration

B. Root pressure

C. Osmotic pressure

D. Translocation

Answer: B



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113. Root pressure can be demonstrated by means of

- A. Wilting
- B. Guttation
- C. Transpiration
- D. Exudation/bleeding

Answer: D



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114. Strasburger rejected the vital force theory on the ground that

- A. Living cells are incapable of translocation
- B. Water rises in dead cells
- C. Respiration occurs in living cells
- D. Living cells are capable of growth

Answer: B



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115. The pressure that develops in roots due to the metabolic activities of living cells is

- A. Turgor pressure
- B. Osmotic pressure
- C. Root pressure
- D. Diffusion pressure

Answer: C



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116. Which of the following statement is wrong in root-pressure concept of ascent of sap

- A. Water can be raised to a height of 6'-7'
- B. Water moves upward in the absence of shoot
- C. Water movement by this force is slow
- D. Root pressure operates in all the plants

Answer: D

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117. Imbibition theory was given by

- A. Sachs
- B. Boehm
- C. Scholander
- D. Curtis

Answer: A

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118. Cohesive force of water molecules is of the magnitude of (Dixon and Joly)

- A. 1-10 atm
- B. 10-15 atm
- C. 45-200 atm
- D. 15-45 atm

Answer: C



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119. The following evidences rejected the atmospheric pressure theory. Which of them is incorrect

- A. It can raise water to height of 32 feet only if complete vacuum is created

- B. Free surface of water is required for proper operation of atmospheric pressure which is readily available in plants
- C. Pressure falls below that of atmospheric pressure because of transpiration
- D. Water rises rapidly to compensate the water loss because of atmospheric pressure.

Answer: B



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120. Which of the following is not the least convincing in the imbibitional theory of ascent of sap

- A. The imbibitional force is very high from 100-1000 atm
- B. The imbibitional force can raise the water to a height of 200'-400'
.i.e. the tallest tree

C. The movement of water is along the walls of the xylem vessels and not through the lumen (cavity) of the vessels

D. The movement of water, no doubt is slow, but to some extent can keep pace with tranpiration

Answer: C

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121. The girdling or ringing experiment is that

A. The metallic ring is tightly tied to a stem

B. The ring of tissue external to xylem is removed in a stem

C. The area is simply marked in the form of ring in a stem

D. None of the above

Answer: B

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122. The girdling or ringing experiment to prove that the water moves through the xylem vessels was performed by

A. Stocking

B. Malpighi

C. Molisch

D. Askenasy

Answer: B



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123. Capillarity theory was proposed by

A. Unger

B. Sachs

C. Bohm

D. Mac Dougal

Answer: C



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124. The main function of xylem vessel is

- A. To provide mechanical support to the plant
- B. To conduct organic food from one part of the plant to another
- C. To conduct water and minerals from one part of the plant to another
- D. None of the above

Answer: C



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125. A girdled plant will eventually die because of

- A. Absence of downward movement of water
- B. Absence of upward movement of water
- C. Absence of upward supply of organic nutrients
- D. Absence of downward movement of organic nutrients.

Answer: D



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126. The cut end of a shoot is dipped in eosine solution. What will happen ?

- A. Ascent of sap does not occur
- B. Ascent of sap does not occur but the leaves remain fresh
- C. Leaves wilt but ascent of sap continues
- D. Ascent of sap occurs and the tracheary elements get stained.

Answer: D



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127. Root pressure theory of ascent of sap is unacceptable because

- A. Water can ascend without root or root pressure
- B. Root pressure cannot explain ascent of sap beyond 10 meters
- C. Root pressure is more during early morning than afternoon
- D. Root pressure does not occur in spring .

Answer: A



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128. Transpiration cohesion theory explains that the upwards pull of water is transmitted from top to bottom by cohesion of molecules caused by

A. Hydrophilic cell walls

B. Hydrogen bonds

C. Oxygen bonds

D. Surface tension

Answer: B



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129. Rising column of water does not break its connection with xylem walls despite negative pressure or tension due to

A. Cohesion amongst water molecules

B. Strong transpiration pull

C. Adhesion

D. Surface tension

Answer: C

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130. Ascent of sap is

- A. Upward movement of water in the plant
- B. Downward movement of organic nutrients
- C. Upward and downward movement of water in the plant
- D. Redistribution of inorganic substances in the plant

Answer: A

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131. Instrument that can be used to demonstrate pull due to vaporisation of water is

- A. Potometer
- B. Atmometer

C. Auxanometer

D. Anemometer

Answer: B



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132. The teansport of sap from root to top of the plant is

A. Ascent of sap

B. Conduction

C. Transport

D. Translocation

Answer: A



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133. In xylem, the ascent of sap takes place in

- A. Tracheids with associated xylem parenchyma
- B. Walls of tracheary elements
- C. Xylem parenchyma
- D. Lumen of tracheary elements

Answer: D



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134. The force with which water molecules are held together in xylem is

- A. Imbibition pressure
- B. Osmotic pressure
- C. Adhesion force
- D. Cohesion force

Answer: D



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135. Root pressure is unable to explain the ascent of sap because it is not found in

- A. Bryophytes
- B. All plants in all reasons
- C. Trees
- D. Spring.

Answer: B



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1. The force which determines the flow of water from one cell to another is

- A. T.P.
- B. D.P.D./ Ψ_w
- C. O.P.
- D. W.P.

Answer: B



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2. DPD is abbreviated form of

- A. Daily photosynthetic deficit
- B. Daily phosphous deficit
- C. Daily pressure deficit
- D. Diffusion pressure deficit

Answer: D



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3. Swelling of wooden frames during rains is caused by

A. Endosmosis

B. Imbibition

C. Capillarity

D. Osmosis.

Answer: B



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4. Osmosis involves

A. Diffusion of suspended particles from higher to lower concentration

B. Diffusion of suspended particles from lower to higher concentration

C. Diffusion of water from more to less concentrated side

D. Diffusion of water from less to more concentrated side

Answer: D



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5. Dry seeds when placed in water swell up due to

A. Imbibition

B. Absorption

C. Diffusion

D. Adsorption

Answer: A



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6. A Cell is plasmolysed after being kept in hypertonic solution. What will be present between cell wall and plasmalemma ?

- A. Isotonic solution
- B. Hypertonic solution
- C. Air
- D. Hypotonic solution

Answer: B



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7. Raisins placed in water swell up due to

A. plasmolysis

B. Adsorption

C. Diffusion

D. Endosmosis

Answer: D



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8. Osmosis is defined as

A. Flow of solvent (water) through a semipermeable membrane from less

B. Flow of solute from a semipermeable membrane

C. Flow of water without a membrane

D. None of the above

Answer: A



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9. A cell increases in volume if the external medium is

- A. Hypotonic
- B. Hypertonic
- C. Isotonic
- D. None of the above

Answer: A



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10. DPD is equal to

- A. $OP \times TP(WP)$
- B. $OP+TP(WP)$
- C. $OP-TP(WP)$

D. TP(WP)-OP.

Answer: C



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11. If cell gets reduced in size when placed in solution, the solution is

A. Hypertonic

B. Hypotonic

C. Weak

D. Saturated

Answer: A



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12. When a cell is fully turgid, which of the following will be zero

- A. Turgor pressure/pressure potential
- B. Wall pressure
- C. Suction pressure/DPD/water potential
- D. Osmotic pressure (solute pressure)

Answer: C

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13. When beet root cylinders are washed and then placed in cold water, anthocyanin does not come out. This indicates that most likely the plasma membrane is

- A. permeable to anthocyanin
- B. Impermeable to anthocyanin
- C. Differentially permeable to anthocyanin.
- D. Dead structure

Answer: B



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14. A slice of Sugar Beet placed in concentrated salt solution would

- A. Become swollen
- B. Lose water and become flaccid
- C. Absorb small quantity of water
- D. Show no change .

Answer: B



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15. Osmosis is

- A. passage of solvent only through a semipermeable membrane

- B. passage of solutes only through a membrane
- C. passage of both solvent and solute through a membrane
- D. passage of solution through a protoplasm.

Answer: A

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16. Osmotic pressure is maximum in

- A. Hydrophytes
- B. Halophytes
- C. Xerophytes
- D. Mesophytes

Answer: B

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17. Water passes into a cell or one cell to another due to

A. O.P.

B. D.P.D.

C. W.P.

D. Diffusion.

Answer: B



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18. Water potential is equal to

A. $\Psi_s + \text{O.P.}$

B. $\Psi_s = \text{T.P.}$

C. $\Psi_p + \psi_w$

D. $\Psi_s + \Psi_p$.

Answer: D



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19. Osmotic pressure is a vacuolated plant cell is

- A. Equal to W.P.
- B. Equal to T.P.
- C. More than D.P.D.
- D. Less then D.P.D.

Answer: C



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20. In a plant cell, O.P. is equal to

- A. T.P.-D.P.D.

B. D.P.D.-T.P

C. T.P.-D.P.

D. D.P.D.+T.P.

Answer: D



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21. When one does not involve osmosis

A. Water passing from one xylem element to the other above it

B. Water passing from soil to root hair

C. Water passing into mesophyll cell from xylem

D. Water passing from root hair cell to cortical cell

Answer: A



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22. Imbibition involves

A. Diffusion

B. Movement of water into imbibant through capillarity

C. Movement of water into imbibant through diffusion as well as capillary action

D. Adsorption of water

Answer: C



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23. 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

A. Diffusion

B. Imbibition

C. Osmosis

D. D.P.D

Answer: B



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24. A semipermeable membrane allows the diffusion of

A. Solutes

B. Solvent

C. Both solvent and solutes

D. None of the above

Answer: B



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25. Under which condition does the D.P.D. become more than O.P.

A. $O.P. < T.P.$

B. $O.P. = T.P.$

C. T.P. is negative

D. $OP > T.P.$

Answer: C



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26. When concentration of solutes is low in the soil, absorption of water

is

A. Stopped

B. Increased

C. Reterded

D. Normal.

Answer: B



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27. Excessive supply of chemical fertilizers often causes wilting/death of crop plant due to

- A. Exosmosis
- B. Endomosis
- C. Imbibition
- D. Turgidity.

Answer: A



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28. Cell 'A' with O.P. = 10 atm and T.P. = 5 O.P. = 15 atm and T.P. = 12 atm. The flow of water will be

A. From A to B

B. Equal flow

C. From B to A

D. No flow

Answer: C



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29. Compared to 1M sucrose solution, the Ψ_w of 1M sodium chloride solution is

A. High

B. Same

C. Lower

D. None of the above

Answer: C

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30. Guard cells differ from epidermal cells in having

- A. Mitochondria
- B. Vacuoles
- C. Cell wall
- D. Chloroplasts

Answer: D

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31. Active K^+ exchange mechanism for opening and closing of stomata was given by

- A. Darwin
- B. Levitt

C. Scarth

D. Khorana

Answer: B



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32. Wilting in plants occurs when

A. Phloem is blocked

B. Xylem is removed/blocked

C. Pith is removed

D. A few leaves are removed

Answer: B



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33. Guttation is the process of elimination of water from plants through

- A. Stomata
- B. Hydathodes
- C. Lenticels
- D. Wounds.

Answer: B



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34. Which of the following is used to determine the rate of transpiration in plants ?

- A. Porometer/Hygrometer
- B. Potometers
- C. Auxanometer
- D. Tensiometer/Barometer

Answer: B



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35. What is the action spectrum of transpiration ?

- A. Green and ultraviolet
- B. Orange and red
- C. Blue and far red
- D. Blue and red

Answer: D



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36. Water drops present on leaf margins of *Tropaeolum*, *Balsam* and grasses in early morning are due to

A. Guttation

B. Dew

C. Osmosis

D. Transpiration .

Answer: A



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37. Stomatal opening is under the control of

A. Epidermal cells

B. Palisade cells

C. Spongy parenchyma cells

D. Guard cells

Answer: D



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38. Maximum transpiration takes place from

- A. Stem
- B. Leaves
- C. Roots
- D. Flowers and fruits

Answer: B



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39. In which type, the stomata are present exclusively on the upper surface of the leaves

- A. Potato type
- B. Potamogeton type
- C. Barely type

D. Water Lily type

Answer: D



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40. Number of stomata present per cm^2 of a common leaf is about

A. Less than 100

B. More than 100,000

C. 1 million

D. 10000

Answer: D



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41. Which is produced during water stress that brings stomatal closure

- A. Ethylene
- B. Abscisic acid
- C. Furolic acid
- D. Coumarin.

Answer: B

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42. In which of the following plants would metabolism be hindered if the leaves are coated with wax on their upper surface

- A. Hydrilla
- B. Lotus
- C. Pistia
- D. Vallisneria

Answer: B

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43. The following percentage of water absorbed by herbaceous plants is lost in transpiration

A. 80

B. 60

C. 99

D. 40

Answer: C

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44. Teranspiration is least in

A. Good soil moisture

B. High wind velocity

C. Dry environment

D. High atmospheric humidity.

Answer: D



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45. Transpiration is high under

A. Rainy season/high humidity

B. Winter

C. High temperature

D. Low wind velocity

Answer: C



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46. Potometer is an instrument that measures

- A. Respiration
- B. Transpiration
- C. Growth
- D. Photosynthesis

Answer: B



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47. Wilting appears due to excessive

- A. Respiration
- B. Photosynthesis
- C. Absorption
- D. Transpiration .

Answer: D



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48. Transpiration is regulated by movements of

- A. Guard cells
- B. Subsidiary cells
- C. Epidermal cells
- D. Mesophyll cells

Answer: A



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49. Transpiration differs from evaporation in

- A. Rate of water loss

B. Transpiration is a physiological process while evaporation is a physical process

C. Transpiration is a physical process while evaporation is a physiological process

D. Frequency of water loss

Answer: B



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50. Rate of transpiration is reduced with

A. Rise in temperature

B. Decrease in light intensity

C. Increase in wind velocity

D. Increase in water uptake .

Answer: B



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51. Guttation is mainly due to

- A. Root pressure
- B. Osmosis
- C. Transpiration
- D. Imbibition

Answer: A



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52. Which one keeps its stomata open during night and closed during day

- A. Cactus
- B. Water Lily
- C. Ivy

D. Hibisus

Answer: A



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53. Which one give the most valid and recent explanation for stomatal movements?

A. Guard cells photosynthesis

B. Starch hydrolysis theory

C. Potassium influx and efflux

D. Transpiration .

Answer: C



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54. The stomatal type of cereals which open only for a few hours during the day is

- A. Barley type
- B. Potato type
- C. Alfalfa type
- D. Bean type

Answer: A



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55. In most of the thin leaf mesophytes, the leaf stomata open during day and close night. It comes under

- A. Barley type
- B. Potato type
- C. Alfalfa type

D. Bean type

Answer: C



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56. Rate of transpiration is dependent upon

A. Negative turgor pressure

B. Temperature

C. D.P.D.

D. Vapour pressure deficit

Answer: D



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57. In hot summer day, plant cooling occurs due to

A. Transport of water from root to all parts of the plant

B. Loss of liquid water

C. Water loss from entire plant

D. Loss of water vapours from foliar surface.

Answer: D



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58. Conversion of starch to organic acids is required for

A. Stomatal opening

B. Stomatal closing

C. Stomatal formation

D. Stomatal activity

Answer: A



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59. Element involved in stomatal regulation, its opening and closing is

- A. Zinc
- B. Magnesium
- C. Potassium
- D. Iron.

Answer: C



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60. 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

Answer: D



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61. In guard cells when suger is converted into starch, the stomatal pore

A. Closes completely

B. Opens partially

C. Opens fully

D. Remains unchanged

Answer: A



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62. Guttation occurs in well watered herbaceous plants of well drained soils during

- A. Evening
- B. Morning
- C. Day
- D. Noon.

Answer: B



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63. Water will be absorbed by root hairs when the external medium is

- A. Hypotonic
- B. Hypertonic
- C. Isotonic
- D. Viscous.

Answer: A



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64. Roots hairs occur in the zone of

- A. Cell division
- B. Cell elongation
- C. Cell maturation
- D. Mature cells

Answer: C



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65. Root cap has no role in water absorption because

- A. It has no direct connection with the vascular system

- B. It has loosely arranged cells
- C. It has no cells containing chloroplasts
- D. It has no root hairs

Answer: B



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66. Root pressure is maximum at the time of

- A. Water absorption as well as transpiration are low
- B. Both water absorption and transpiration are high
- C. Absorption is low and transpiration is high
- D. Absorption is high and transpiration is low

Answer: D



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67. Path of water movement from soil to xylem is

A. Metaxylem \Rightarrow Protoxylem \Rightarrow Cortex \Rightarrow Soil \Rightarrow Root hair

B. Cortex \Rightarrow Root hair \Rightarrow Endodermis \Rightarrow Pericycle \Rightarrow Protoxylem
 \Rightarrow Metaxylem

C. Soil \Rightarrow Root hair \Rightarrow Cortex \Rightarrow Endodermis \Rightarrow Pericycle \Rightarrow
Protoxylem \Rightarrow Metaxylem

D. Pericycle \Rightarrow Soil \Rightarrow Root hair \Rightarrow Cortex \Rightarrow Endodermis \Rightarrow
protoxylem \Rightarrow Metaxylem.

Answer: C



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68. In soli, the water available for root absorption

A. Gravitational water

- B. Capillary water
- C. Hygroscopic water
- D. Combined water

Answer: B



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69. Rate of Water absorption can be increased through

- A. Decreased transpiration
- B. Decreased ion absorptiion
- C. Increased photosynthesis
- D. Increased transpiration

Answer: D



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70. Water in plants is transported by or ascent of sap take place through

- A. Cambium
- B. Pholem
- C. Xylem
- D. Epidermis

Answer: C



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71. 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 Joly

Answer: D

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72. Water rises in the stem due to

- A. Cohesion and transpiration pull
- B. Turgor pressure
- C. Osmotic Pressure
- D. None of the above

Answer: A

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73. According to one vital force theory, ascent of sap is due to active pulsation of innermost layer of cortex. This theory was given by
In plant 'transpiration pull' theory for ascent of sap was first proposed by

A. J.C. Bose

B. Dixon

C. Strasburger

D. Sachs .

Answer: A



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74. At what time, the stomatal transpiration is completely stopped

A. Morning

B. Night

C. Evening

D. None of the above

Answer: B



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75. Upward movement of water through xylem is best explained by

- A. Cohesion theory
- B. Pulsation theory
- C. Capillarity theory
- D. Root pressure theory

Answer: A



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76. The principal pathway of water translocation in angiosperms is

- A. Sieve cells
- B. Sieve tube elements
- C. Xylem vessel system

D. Xylem and phloem

Answer: C



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77. Cohesive force of water is due to

A. O-bonds

B. OH-bonds

C. S-bonds

D. H-bonds

Answer: D



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78. Ringing/girdling experiment was first performed by

- A. Harting
- B. Strasburger
- C. Godlewski
- D. Bose

Answer: A

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79. During osmosis, water passes through a semipermeable membrane

- A. From Low Ψ_w To High Ψ_w
- B. (C) From High Solution concentration To *Low solution concentration*
- C. (C) From High Ψ_s To Low Ψ_s
- D. (C) From Hypotonic Solution To Hypertonic solution

Answer: D

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80. Diffusion of water through selectively permeable membrane is

- A. Diffusion
- B. Imbibition
- C. Osmosis
- D. Translocation

Answer: C



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81. A higher plant cell covered with cutin and suberin is placed in water.

After 15 minutes, the cell

- A. Will be killed
- B. Size will increase
- C. Size will remain unchanged

D. Size will decrease

Answer: C



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82. Water is absorbed from outside solution only when it is

A. Isotonic

B. Hypotonic

C. Hypertonic

D. None of the above

Answer: B



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83. Supply of excess fertilizer and watering of a grass lawn causes browning of grass leaves due to

- A. Decreased photosynthesis
- B. Water-logging of soil
- C. Leaching of fertilizer to lower soil strata
- D. Osmosis and death of root .

Answer: D



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84. During absorption of water by roots , the water potential of cell sap is lower than that of

- A. Pure water and soil solution
- B. Neither pure water nor soil solution
- C. Pure water but higher than that of soil solution

D. Soil solution but higher than that of pure water

Answer: A



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85. Plant cells kept in hypertonic solution will get

A. Lysed

B. Turgid

C. Deplasmolysed

D. Plasmolysed

Answer: D



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86. 0.1 M solution of a solute has a water potential of

A. $-2.3\bar{3}$

B. Zero

C. 2.3 bars

D. 22.4 bars

Answer: A



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87. The movement of free atoms from higher concentration to lower concentration is called

A. Osmosis

B. Diffusion

C. Endosmosis

D. Exosmosis

Answer: B

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88. In seed germination the first to occur is

- A. Diffusion
- B. Osmosis
- C. Imbibition
- D. All the above

Answer: C

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89. Plasmolysis is due to

- A. Exosmosis
- B. Endosmosis
- C. Osmosis

D. Adsorption

Answer: A



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90. Mango dipped in concentration NaCl solution will

A. Burst

B. Contract

C. Swell

D. No effect

Answer: B



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91. Cotton fibres dipped in water absorb water through

A. Endosmosis

B. Exosmosis

C. Capillarity

D. Imbibition

Answer: C



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92. A cell placed in a solution get deplasmolyed . The solution is

A. Hypotonic

B. Hypertonic

C. Isotonic

D. Ditonic

Answer: A



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93. In the process of osmosis, volume of solvent

- A. Decrease
- B. Increase
- C. Remain constant
- D. Volume has no relation to osmosis

Answer: B



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94. The term water potential was coined by

- A. Sayre
- B. Von Mohl
- C. Lloyd

D. Slatyer and Taylor

Answer: D



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95. Water potential of a solution is depicted by

A. Ψ_p

B. Ψ_w

C. Ψ_x

D. $\Delta\Psi$

Answer: B



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96. Endosmosis of water occurs when water potential of the cell sap is

- A. Higher
- B. Equal
- C. Lower
- D. None of the above

Answer: C

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97. With rise in turgidity, wall pressure will

- A. Decrease
- B. Increase
- C. Fluctuate
- D. Remain unchanged

Answer: B

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98. Cut flowers are dipped basally in dilute sodium chloride solution to

- A. Reduce bacterial growth
- B. Reduce transpiration
- C. Induce endosmosis
- D. Increase solute inside flowers

Answer: B



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99. "Osmosis is flow of solution from higher concentration to solution of lower concentration through semi-permeable membrane" What is incorrect in the statements ?

- A. Exact concentration of solution is not given
- B. Character of semipermeable membrane is not given

C. Flow of solution is not possible through semipermeable membrane

D. All the above

Answer: C



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100. Stomata generally open during the day because the guard cells have

A. Outer thin wall

B. Chlorophyll

C. Kidney-shape

D. Larger nuclei

Answer: B



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101. An adaptation for better gaseous exchange in plant leaves is

- A. Hair on lower surface
- B. Multiple epidermis
- C. Waxy cuticle
- D. Stomata on lower surface away from direct sun rays .

Answer: D



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102. Transpiration is helpful to plants in

- A. Cooling
- B. Loss of excess nutrients
- C. Upward conduction/ascent of sap
- D. Lose of excess water.

Answer: C



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103. Temporary wilting is due to

A. Photosynthesis

B. Transpiration

C. Respiration

D. Absorption of water

Answer: B



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104. Stomata open when the guard cells possess

A. Less K^+

B. More ABA

C. More K^+

D. All the above

Answer: C



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105. An antitranspirant is

A. Cobalt chloride

B. Mercury

C. Potassium

D. Phenyl mercuric acetate.

Answer: D



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106. Which of the following factors is most important in regulation of transpiration

- A. Relative humidity
- B. Temperature
- C. Light
- D. Wind.

Answer: B



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107. Transpiration is dependent upon

- A. Difference of vapour pressure
- B. Degree of stomatal opening
- C. Availability of green light.
- D. Both A and B.

Answer: D



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108. Plant cooling occurs due to

- A. Assimilation
- B. Guttation
- C. Photorespiration
- D. Transpiration

Answer: D



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109. High CO_2 concentration in leaf interior will cause

- A. Stomatal opening

- B. Stomatal closure
- C. No effect on stomata
- D. Stomata are destroyed .

Answer: B



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110. Water exudation through hydathodes is

- A. Guttation
- B. Transpiration
- C. Hydrolysis
- D. Excretion

Answer: A



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111. Hydathodes occur on

- A. Stem
- B. Leaves
- C. Roots
- D. All the above

Answer: B



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112. Water potential in leaf tissue is 'positive' (near zore) during

- A. Low transpiration
- B. Excessive absorption
- C. Excessive transpirants
- D. Guttation.

Answer: D



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113. A leafy twig of mesophytic plant dipped in water would demonstrate

- A. Photosynthesis
- B. Transpiration
- C. Respiration
- D. Guttation.

Answer: B



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114. Which is not related to transpiration ?

- A. Absorption and distribution of minerals

B. Cirulation of water

C. Temperature

D. Bleeding

Answer: D



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115. The loss of water through cuticle reaches upto

A. 5 %

B. 10 %

C. 20 %

D. 40 %

Answer: D



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116. Phytohormone connected with closing of stomata is

- A. ABA
- B. Kinetin
- C. GA
- D. IBA.

Answer: A



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117. A twig kept in water having some salt remains fresh for longer period due to

- A. Decrease in bacterial degradation
- B. Exosmosis
- C. Decrease in transpiration rate
- D. Absorption of more water

Answer: C



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118. Root pressure is due to

- A. Active absorption/transport
- B. passive absorption/transport
- C. Increased transpiration
- D. Increased photoxynthesis

Answer: A



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119. The movement of water from one cell of cortex to the next in the root is due to

- A. Water potential gradient
- B. Chemical potential gradient
- C. Accumulation of inorganic salts in the cells
- D. Accumulation of organic salts in the cells

Answer: A

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120. Exudation of xylem sap on cutting of a shoot is due to

- A. Guttation
- B. Root pressure
- C. Transpiration
- D. None of the above

Answer: B

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121. Water entering root due to diffusion is part of

- A. Endocytosis
- B. Osmosis
- C. Passive absorption
- D. Active absorption

Answer: C



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122. Water absorbed by root in order to meet the requirement of transpiration is due to

- A. Transpiration pull
- B. Osmosis
- C. Imbibition

D. Plasmolysis

Answer: B



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123. Root hair absorbs water from soil through

A. Turgor pressure

B. Ion exchange

C. Osmosis

D. DPD.

Answer: C



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124. Prolonged water-logging kills plant due to

A. Stoppage of root respiration

B. Dilution of soil nutrients

C. Dilution of plant cell sap

D. Leaching of nutrients .

Answer: A



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125. Rate of water absorption is slow near freezing point because

A. Water absorption is a metabolic process

B. Cell growth stops

C. Transpiration is reduced

D. Cell membranes become more viscous.

Answer: D



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126. Water ascends in plants through

- A. Xylem
- B. Phloem
- C. Stele
- D. Pith.

Answer: A



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127. Cohesion/transpiration pull theory of ascent of sap was proposed by

- A. Munch
- B. Stephen Hales
- C. Dixon and Joly

D. Bose

Answer: C



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128. The force responsible for raising water in 100 ft tall plant is

- A. Transpiration pull
- B. Root pressure
- C. Air pressure
- D. Capillary action.

Answer: A



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129. Which one explains ascent of sap

A. Cohesion-tension theory of Dixon and Joly

B. Starch-Sugar interconversion

C. Photosynthesis

D. None of the above

Answer: A



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130. Water supply in the plant is due to

A. Osmosis

B. Guttation

C. Cohesion force

D. Imbibition

Answer: C



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131. The principal by which blotting paper absorbs water is

- A. Capillary action
- B. Transpiration pull
- C. Root pressure
- D. Absorptive capacity

Answer: A



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132. If cohesion-tension transpiration pull theory is correct, a break in water column should

- A. Increase water content of leaves
- B. Increase rate of photosynthesis
- C. Cause wilting of leaves

D. Have no effect at all

Answer: C



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133. Plant cells dipped in distilled water will become

- A. Turgid
- B. Plasmolysed
- C. Flaccid
- D. Impermeable

Answer: A



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134. To initiate cell plasmolysis, salt solution should be

- A. Isotonic
- B. Hypotonic
- C. Hypertonic
- D. None of the above

Answer: C

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135. Water potential and osmotic potential of pure water are

- A. Zero and zero
- B. 100 and zero
- C. 100 and 100
- D. Zero and 100

Answer: A

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136. If a cell A with OP 10 bars and TP 4 bars is connected to cells, B, C and D having OP and TP respectively 4 and 4, 10 and 5 and 7 and 3 bars, the flow of water will be

- A. C to A, B and D
- B. B to A, C and D
- C. A to D, B and C
- D. A to B, C and D

Answer: B



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137. Use of excessive fertilisers causes wilting due to

- A. Endosmosis
- B. Exosmosis

C. Imbibition

D. None of the above

Answer: B



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138. Osmotic potential is depicted as

A. (-)

B. (+)

C. X

D. (÷)

Answer: A



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139. Potato slices were placed in sucrose solution . After half an hour, density of sucrose solution increased . Water potential of Pototo tuber is

- A. Equal to solute potential of sucrose solution
- B. Greater then sloute potential of sucrose solutioin
- C. Less then solute potential of sucrose solution
- D. Half the concentration of sucrose solution

Answer: C



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140. A cell will become fully turgid if it is placed in

- A. Hypotonic solution
- B. Isotonic solution
- C. Hypertonic solution
- D. All the above

Answer: A



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141. Dry wooden stakes in cracks of a rock and soaked will develop pressure that will split the rock. The phenomenon is

- A. Osmotic pressure
- B. Imbibition
- C. Turgor pressure
- D. Deplasmolysis

Answer: B



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142. Cells absorb water through

- A. Osmosis only
- B. Imbibition only
- C. Both osmosis and imbibition
- D. None of the above

Answer: C

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143. In plasmolysis, a plant cell

- A. Swells up
- B. Bursts
- C. Becomes flaccid
- D. Becomes turgid

Answer: C

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144. A cell placed in hypotonic solution will

- A. Shrink
- B. Show exosmosis
- C. Show endosmosis
- D. No change in shape or size .

Answer: C



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145. A cell shrinks on being kept in a solution The solution is

- A. Isotonic
- B. Hypotonic
- C. Hypertonic

D. None of the above

Answer: C

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146. Shrinking of protoplasm from cell wall under influence of hypertonic solution is

- A. plasmolysis
- B. Apoptosis
- C. Deplasmolysis
- D. Flaccidity

Answer: A

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147. Wooden doors swell up and get stuck during rainy season due to

- A. Endosmosis
- B. Imbibition
- C. Capillarity
- D. Exosmosis

Answer: B



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148. In plant water moves from

- A. Less negative to more negative gradient
- B. More negative to less negative gradient
- C. Similar gradient
- D. Zero gradient

Answer: A



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149. Movement of water through semipermeable membranes produces

- A. Wall pressure
- B. Suction pressure
- C. Osmotic pressure
- D. Turgor pressure .

Answer: D



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150. Adding solution to pure water will cause development of

- A. Positive water potential

- B. More Positive water potential
- C. More negative water potential
- D. Negative water potential

Answer: D



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151. Lose of water from tips of leaves is

- A. Transpiration
- B. Guttation
- C. Bleeding
- D. Respiration

Answer: B



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152. Maximum transpiration occurs in

- A. Algal cells
- B. Xerophytic plants
- C. Hydriophytic plants
- D. Mesophytic plants

Answer: D



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153. Nonfunctional stomata can be seen in

- A. mango leaf
- B. Pea leaves
- C. Hydrilla
- D. Lotus

Answer: C



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154. Latest explanation for closure of stomata is

- A. Starch glucose theory
- B. Active K^+ ions theory
- C. ABA theory
- D. None of the above

Answer: C



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155. When half the leaves are removed randomly, transpiration will show

- A. Higher magnitude but lower flux or rate per unit

- B. Lower magnitude but higher flux
- C. Both magnitude and flux increase
- D. Both magnitude and flux decrease .

Answer: B



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156. Who had said that "transpiration is a necessary evil"

- A. Bose
- B. Steward
- C. Anderson
- D. Curtis

Answer: D



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157. Rate of transpiration is related to

- A. Light and temperature
- B. Light, temperature , atmospheric humidity and wind
- C. Light , temperature and wind
- D. Soil and temperature

Answer: B



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158. Enzyme connected with opening and closing of stomata is

- A. α -amylase
- B. Pyruvic kinase
- C. PEP carboxylase
- D. RuDP carboxylase

Answer: C



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159. Rate of transpiration is highest when

- A. Soil is wet and air is dry
- B. Soil is wet and air is humid
- C. Soil is dry and air is humid
- D. Both soil and air are dry

Answer: A



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160. An internal factor in transpiration is

- A. CO_2

B. O_2

C. N_2

D. Stomata

Answer: D



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161. Root pressure helps in ascent of sap by

A. Pumping food in phloem

B. Pumping sap into xylem in roots

C. Pumping sam in stem for sending it to roots

D. All the above

Answer: B



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162. Given below are assertion and reason .Assertion . Stomata remain open during day time .Reason . Stomata help in exchange of gases

- A. Point out if both are true with reason being correct explanation (A),
- B. assertion is true but correct explanation (B),
- C. Assertion is true but reason is wrong (C)
- D. And both are wrong (D)

Answer: B



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163. Match the columns

Column I	Column II
a Girdling	p Ascent of sap
b Cobalt chloride paper method	q Transpiration
c Atmometer	r Unequal transpiration on two surfaces
d Ball jar experiment	s Translocation in phloem

A. $a - s, b - p, c - q, d - r$

B. $a - s, b - r, c - p, d - q$

C. $a - q, b - p, c - s, d - r$

D. $a - r, b - p, c - s, d - q$

Answer: B



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164. A sudden increase in carbon dioxide concentration around a leaf will cause

A. Wider opening

B. Increase in transpiration

C. Closure in stomata

D. Decrease in transpiration due to closure of stomata

Answer: D



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165. Changes in turgidity of guard cells are controlled by

- A. Potassium
- B. Chloride
- C. Malic acid
- D. All the above

Answer: D



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166. Rate of transpiration is high in

- A. C_3 plants
- B. C_4 plants
- C. CAM plants
- D. Both C_3 and C_4 plants

Answer: A



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167. Plants exchange water with environment through structures by two cells

- A. Lenticels
- B. Hydathodes
- C. Stomata
- D. All the above

Answer: C



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168. Arrange root hair cell, inner cortical cell and mesophyll cell in ascending order of DPD

A. Mesophyll cell, Root hair cell and Cortical cell

B. Cortical cell, Mesophyll cell and Root hair

C. Root hair cell , Cortical cell and Mesophyll cell

D. Root hair cell, Mesophyll cell and Cortical cell

Answer: C



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169. In root hair, water enters due to

A. Diffusion

B. W.P.

C. T.P.

D. O.P.

Answer: D



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170. The direction of water in the leaflets of *Cycas* from midrib is

- A. Upward
- B. Downward
- C. Lateral
- D. Both A and B.

Answer: C



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171. Sir J.C. Bose proposed in theory of ascent of sap known as

- A. Pulsation theory
- B. Transpiration pull theory
- C. Relay pump theory

D. Capillary force theory

Answer: A



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172. Cohesion-tension theory is related to

A. Respiration

B. Ascent of sap

C. Transpiration

D. Photosynthesis

Answer: B



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173. A cell kept in a solution increases in volume. The solution is

- A. Hypotonic
- B. Isotonic
- C. Hypertonic
- D. Either A or B

Answer: A

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174. Guttation is due to

- A. Negation root pressure
- B. Positive roots pressure
- C. Transpiration
- D. None of the above

Answer: B

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175. Epidermal cells containing chloroplasts are

- A. Hydathodes
- B. Accessory cells
- C. Stomata
- D. Guard cells

Answer: D



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176. Each stoma is surrounded by

- A. passage cells
- B. Guard cells
- C. Parenchyma cells

D. Lenticels

Answer: B



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177. Which one is correct ?

A. $\Psi_m = \Psi_p + \Psi_s + \Psi_w$

B. $\Psi_w = \Psi_p + \Psi_s + \Psi_m$

C. $\Psi_p = \Psi_w + \Psi_m + \Psi_s$

D. $\Psi_w = \Psi_w + \Psi_p + \Psi_p + \Psi_s$

Answer: B



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178. Match the columns and find the correct combination

Column I

Column II

- | | |
|--------------------------------|-------------------------------------|
| <i>a</i> Ganong's Potometer | (i) Rate of growth |
| <i>b</i> Cobalt chloride paper | (ii) Rate of transpiration |
| <i>c</i> Pfeffer's auxanometer | (iii) Differential transpiration |
| <i>d</i> Porometer | (iv) Opening and closing of stomata |

A. (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

B. (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

C. (a) - (ii), (b) - (iii), (c) - (i), (d) - (iv)

D. (a) - (iii), (b) - (i), (c) - (iv), (d) - (ii)

Answer: C



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179. Find the correct order for instrument used for measuring (i)

Transpiration (ii) Size of stomata (iii) Atmospheric pressure (iv) Osmosis

A. Potometer, manometer, porometer, osmometer

B. Manometer, potometer, porometer, osmometer

C. Porometer, manometer, potometer, osmometer

D. Potometer, potometer, manometer, osmometer.

Answer: D



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180. Chlorophyllous cells fewer in number, unique is shape with inner walls thicker are

A. Guard cells

B. Passage cells

C. Subsidiary cells

D. Bulliform cells

Answer: A



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181. Water lost through transpiration is

- A. Pure water
- B. Rich in organic solutes
- C. Rich in dissolved salts
- D. All the above

Answer: A



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182. Common between guard cells and mesophyll cells is

- A. Dumbell shaped
- B. Differentially thick walls
- C. Presence of chloroplasts
- D. Uniformly thin cell wall .

Answer: C



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183. A leaf with more stomata on lower surface belongs to

- A. Potato type
- B. Oat type
- C. Apple-mulberry type
- D. Nymphaea type

Answer: A



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184. main function of lenticel is

- A. Transpiration

B. Guttation

C. Bleeding

D. Gaseous exchange .

Answer: D



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185. Which is the most important factor in regulation of transpiration

A. Light

B. Temperature

C. Humidity

D. Wind.

Answer: B



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186. Epidermal is associated with

- A. Respiration
- B. Guttation
- C. Transpiration
- D. Photosynthesis

Answer: B



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187. Stomata open during day due to

- A. Accumulation of K^{+} ion and sugar
- B. High pH
- C. Osmotic effect of ions present in guard cells
- D. None of the above

Answer: A



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188. Choose the correct sequence of events during wilting

- A. Exosmosis, deplasmolysis, temporary wilting , permanent wilting
- B. Exosmosis, plasmolysis temporary, wilting , permanent wilting
- C. Endosmosis, plasmolysis temporary wilting, permanent wilting
- D. Exosmosis,deplasmolysis, plasmolysis, tempoorary wilting, permanent wilting.

Answer: B



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189. Which can preserve food stuff

A. Sugar and vinegar

B. Salt and suger

C. Vinegar

D. All the above

Answer: D



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190. If turgor pressure becomes equal to osmotic pressure

A. Water leaves the cells

B. Water enters the cell

C. No exchange of water takes place

D. Solute pass out of the cell

Answer: C



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191. Risk of spoilage is less in salted pickles as it causes

- A. Guttation
- B. Imbibition
- C. Diffusion
- D. Plasmolysis

Answer: D



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192. Solution A has $\Psi_s = -30$ bars and $\Psi_p = 5$ bars. Solution B has $\Psi_s = -10$ bars and $\Psi_p = 0$ atm. The two are separated by semipermeable membrane. Flow of water will be

- A. B to A
- B. A to B

C. Equal in both directions

D. No flow of water .

Answer: A



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193. Amount by which water potential is reduced due to presence of solute is called

A. Pressure potential

B. Solute potential

C. Mateic potential

D. None of the above

Answer: B



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194. Uniformly sweet taste of Tea or Coffee is due to

- A. Spereading
- B. Osmosis
- C. Permeability
- D. Diffusion

Answer: D



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195. Exchange of substances between a cell and its environment is due to

- A. Osmosis
- B. Active transport
- C. Diffusion
- D. All the above

Answer: D



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196. Turgor pressure develops in epiblema cells of root due to

- A. High water potential of cortical cells
- B. Entry of water into root hairs and increase in volume of cell sap
- C. Filling of large vacuole in root hair with cell sap
- D. Osmotic diffusion of water into pericycle through passage cells

Answer: B



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197. Root hairs absorb water from soil due to

- A. Osmotic pressure

B. Turgor pressure

C. Suction pressure

D. Root pressure

Answer: C



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198. Which is not associated with ascent of sap in tall trees

A. Continuity of water column

B. Cohesion and adhesion of water molecules

C. Transpiration pull

D. Pressure of tracheary elements

Answer: D



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199. Cohesion force existing among water molecules contributes to

- A. plasmolysis
- B. Christian Wolf
- C. Osmosis
- D. Translocation

Answer: B



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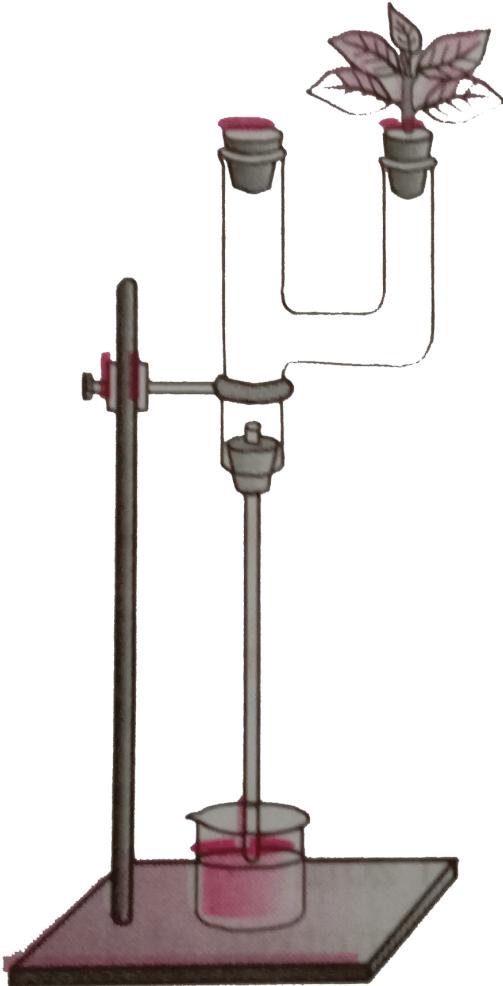
200. For ascent of sap, capillary force theory was first proposed by

- A. Sachs
- B. Christian Wolf
- C. Strasburger
- D. Dixon and Joly

Answer: B

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201. The experiment set up shown in the adjacent diagram is for



- A. The demonstration of development of suction force due to transpiration
- B. Measuring the rate of transpiration
- C. The demonstration of ascent of sap
- D. The demonstration of anaerobic respiration

Answer: B



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202. When the concentration of solution is greater outside the cells than inside the cells, the solution outside the cells is

- A. Isotonic
- B. Hypertonic
- C. Hypotonic
- D. None of the above

Answer: B



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203. Stomata of CAM plants

- A. Are always open
- B. Open during the day and close at night
- C. Open during night and close during the day
- D. Never open

Answer: C



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204. 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

Answer: D



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205. Osmotic pressure of a solution is

A. More than that of pure solvent

B. Less than that of pure solvent

C. Variable depending upon concentration

D. Equal to that of pure solvent

Answer: A



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206. If a cell A with $DPD = 5$ bars is connected to cells B, C 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. D

B. C

C. B

D. A.

Answer: A



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207. Pea seeds absorb more water and swell up more as compared to Paddy seeds due to

A. Higher imbibition by proteins present in Pea seeds

B. High osmotic potential of Pea seeds

C. Paddy covering is impermeable to water

D. All the above

Answer: A



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208. In order to demonstrate root pressure, the plant is given a cut

A. At the tip

B. Transition zone

C. A few centimetres above the soil

D. A few centimetres below the soil .

Answer: C



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209. Which one is against the theory of ascent of sap by Dixon and Joly

- A. Pores in tracheary elements
- B. Cohesion force of water molecules
- C. Adhesion force of water molecules
- D. Requirement of ATP

Answer: D



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210. An adaptation to reduce transpiration is

- A. Spongy parenchyma
- B. High osmotic pressure
- C. Hydathodes
- D. Aerenchyma

Answer: B



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211. Rate of transpiration higher than rate of water absorption shall cause

- A. Growth
- B. Leaf fall
- C. Wiling
- D. Death

Answer: C



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212. Plants loose most of water through leaves by

- A. Respiration

B. Guttation

C. Photosynthesis

D. Transpiration

Answer: D



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213. Presence of moisture in the atmosphere

A. Increases rate of transpiration

B. Decreases rate of transpiration

C. Does not affect rate of transpiration

D. Transpiration becomes rapid

Answer: B



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214. Stomata close in response to

- A. Hot dry weather
- B. Abscisic acid
- C. Cytokinin
- D. Both A and B.

Answer: D



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215. Water potential is maximum in case of

- A. Pure water
- B. 2 % glucose
- C. 10 % glucose
- D. 10 % NaCl

Answer: A



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216. Which one is not connected with transport across the cell membrane

- A. Osmosis
- B. Active transport
- C. Diffusion
- D. Surface tension

Answer: D



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217. Entry of water into a cell causes swelling of protoplast due to

- A. DPD

B. Osmotic pressure

C. Imbibition

D. Turgor pressure .

Answer: D



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218. Wilting occurs when

A. Transpiration higher then absorption

B. Absorption higher then transpiration

C. Higher relative humidity of atmosphere

D. Excess root pressure

Answer: D



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219. A plant cell becomes turgid due to

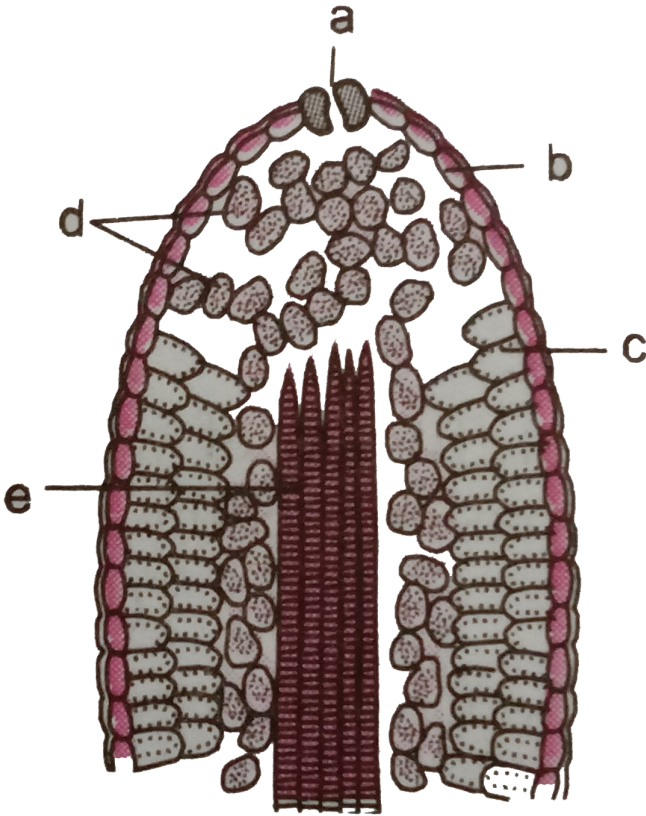
- A. Plasmolysis
- B. Exosmosis
- C. Endosmosis
- D. Electrolysis.

Answer: A



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220. Figure of hydathoda has a labelling. What is correct

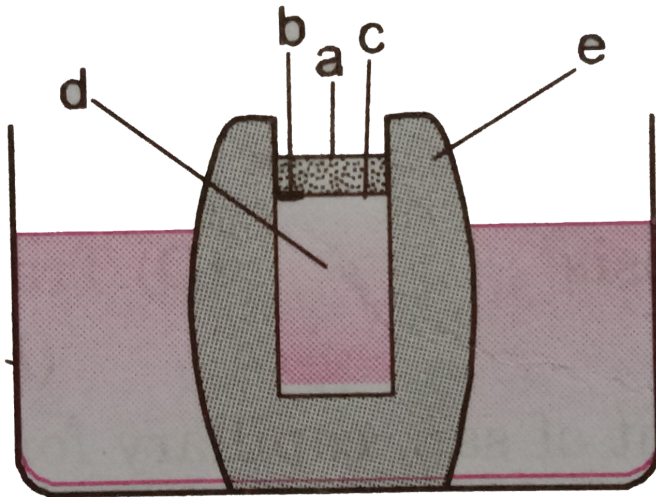


- A. a- guard cell, b-epithem, c-mesophyll, d-epidermis , e- vascu - lature
- B. a- guard cell, b-epidermis , c-mesophyll, d-epithem , e- vascu - lature
- C. a- water pore , b-epidermis , c-mesophyll, d-epithem , e- vasculature
- D. a- ostiole , b-epidermis , c-mesophyll, d-epithem , e- vasculature

Answer: C

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221. Choose the correct combination of labelling in Potato osmoscope



- A. a - final level, b - dot pin, c - initial level, d - Sugar solution, e - Potato tuber .
- B. a - initial level, b - dot pin, c - final level, d - water, e - potato tuber
- C. a - final level, b - dot pin, c - initial level, d - water, e - potato tuber
- D. a - final level, b - dot pin, c - initial level, d - water , e - container .

Answer: A



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222. Match the columns and choose the correct combination

a Relay Pump Theory

p Stocking

b Transpiration-cohesion Theory

q Bose

c Mass Flow Theory

r Godlewski

d Pulation Theory

s Dixon and Joly

t Munch

A. *a* - *r*, *b* - *q*, *c* - *t*, *d* - *p*

B. *a* - *q*, *b* - *p*, *c* - *t*, *d* - *r*

C. *a* - *r*, *b* - *p*, *c* - *t*, *d* - *q*

D. *a* - *s*, *b* - *r*, *c* - *p*, *d* - *q*

Answer: C



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223. Stomatal opening and closing is due to

- A. Rise in pH of guard cells causes hydrolysis of starch
- B. Cytokinins and cAMP are required
- C. Abscisic acid promotes closure
- D. All the above

Answer: D



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224. Basis of stomatal opening is

- A. Exosmosis
- B. Endosmosis
- C. Decrease in cell sap concentration
- D. Plasmolysis in guard cell

Answer: B



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225. Movement of materials against concentration gradient is due to

- A. Active transport
- B. Passive transport
- C. Diffusion
- D. Osmosis

Answer: A



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226. Guard cells regulate

- A. Photosynthesis

B. Intensity of light entering leaves

C. Change in green colour

D. Closing and opening of stomata

Answer: D



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227. Plant cell kept in saline drop will

A. Remain unchanged

B. Decrease in size

C. Increase in size

D. Burst out

Answer: B



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228. Which does not cause stomatal opening ?

- A. Influx of K^+ ions
- B. Light
- C. High CO_2 concentration
- D. Circadian thymh

Answer: C



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229. In pickles infection is rare due to

- A. plasmolysis
- B. Decrease in osmotic potential by salt
- C. Increase in osmotic potential by salt
- D. Decrease in temperature by salt

Answer: B



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230. The plant growing in a dry environment possesses

- A. Thin Cuticle
- B. Poorly developed xylem
- C. Sunken stomata
- D. Aerenchyma

Answer: C



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231. Stomata generally operate in response to

- A. Atmospheric humidity

B. Soil temperature

C. Atmospheric temperature

D. Light

Answer: D



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232. Stomatal open in the daytime due to

A. Decrease in pH

B. Decrease in water potential

C. Increase in water potential

D. Light

Answer: B



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233. Wilting occurs due to

- A. Diffusion
- B. Imbibition
- C. Exosmosis
- D. Endosmosis

Answer: C



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234. In tall trees water is absorbed due to

- A. Transpiration/suction pull
- B. Root Pressure
- C. Capillary action
- D. Photosynthesis

Answer: A



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235. Match the columns and find out the correct combination

- | | |
|-------------------------|------------------------|
| (a) Bulliform cells | (i) Lenticels |
| (b) Subsidiary cells | (ii) Isobilateral leaf |
| (c) Epithen | (iii) Stomata |
| (d) Complementary cells | (iv) Hydathodes |
| | (v) Phellem |

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

B. (a) - (i), (b) - (ii), (c) - (iv), (d) - (iii)

C. (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)

D. (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

Answer: C



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236. Passive absorption occurs due to

- A. Tension in root
- B. Tension in xylem sap
- C. ATP
- D. None of the above

Answer: B



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237. The cell becomes turgid in solution which is

- A. Hypertonic
- B. Isotonic
- C. Hypotonic
- D. None of the above

Answer: C

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238. Value of osmotic potential (π) and pressure potential (p) of cells a, b,

cell	π	p
<i>a</i>	-1.0	0.5
<i>b</i>	-0.6	0.3
<i>c</i>	-1.2	0.6
<i>d</i>	-0.8	0.4

Identify the correct sequence for movement of water

A. $b \rightarrow c \rightarrow d \rightarrow a$

B. $c \rightarrow b \rightarrow a \rightarrow d$

C. $d \rightarrow c \rightarrow a \rightarrow b$

D. $b \rightarrow d \rightarrow a \rightarrow c$

Answer: D

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239. Identify the correct statements and find out the correct combination ?

1. Accumulation of K^+ ions in guard cells does not require energy
2. A high pH favours stomatal opening
3. Movement of chloride ions into guard cells is in response to electrical differential created by K^+ ions
4. With entry of several K^+ ions and chloride ions, water potential of guard cells increases .

A. 1 and 3

B. 1 and 2

C. 2 and 3

D. 3 and 4

Answer: C



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240. Transpiration is mainly a process of

A. Imbibition

B. Respiration

C. Osmotic pressure

D. Diffusion

Answer: D



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241. Sunken stomata occur in the leaves of

A. Lemna

B. Nerium

C. Liliium

D. Trifolium

Answer: B



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242. Force developed in cortex of root which pushes water into xylem of root is

- A. Root pressure
- B. Turgor pressure
- C. Osmotic pressure
- D. Diffusion

Answer: A



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243. Match the columns and find the correct combination

<i>I</i>		<i>II</i>
(a) Hypotonic	(i)	Water
(b) Hypertonic	(ii)	Sucrose
(c) Solute	(iii)	Lower tonicity
(d) Solvent	(iv)	Higher tonicity

A. (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

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

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

D. (a) -(iii), (b) - (iv), (c) - (ii), (d) - (i)

Answer: D



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244. Which one is a unit of measurement of water potential/osmotic pressure ?

A. Watts

B. Joule

C. Pascal

D. Litre

Answer: C



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245. Osmosis is not related to diffusion of water from

- A. One cell to another
- B. Soil to root
- C. Xylem to Xylem
- D. None of the above

Answer: C



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246. Potential energy of water is

- A. Osmotic potential
- B. Water potential
- C. Gravity potential
- D. pressure potential

Answer: B



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247. If two solutions have the same osmolarity, they are said to be

- A. Isotonic
- B. Hypertonic
- C. Hypotonic
- D. None of the above

Answer: A



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248. Which ones do not show transpiration ?

- A. Aquatic plants with floating leaves

B. Aquatic submerged plants

C. Plants growing in hilly areas

D. Plants living in deserts

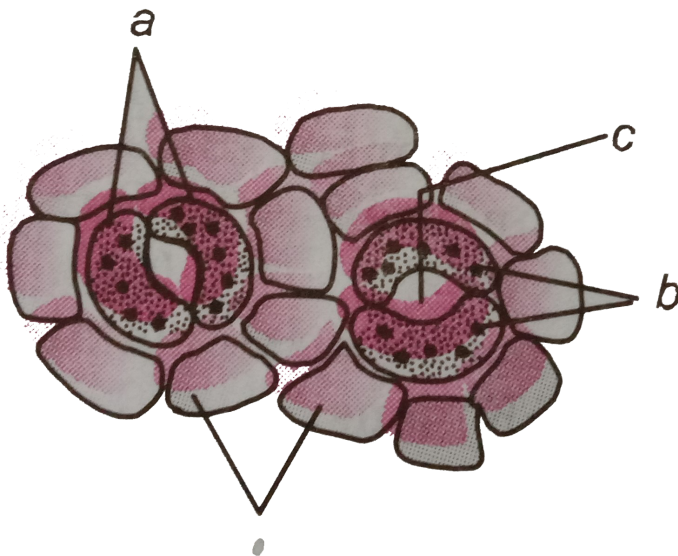
Answer: C



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249. The following figure shows the stomatal apparatus. Identify the parts labelled as a, b, c, d. Choose the correct answer from the following

:



A. a - subsidiary cells, b - chloro - plaste, c - stoma, d - guard cell

B. a - guard cells , b - Stoma, c - Chloroplasts , d - subsidiary cells

C. a - guard cells, b - c - stomachloro - Chloroplasts , c - stoma, d -
subsidiary cell

D. a - subsidiary cells, b - Stoma , c - Chloroplasts d - guard cell

Answer: C



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250. Match the columns and identify the correct combination

I

- a* Mass flow hypothesis
- b* Relay pump theory
- c* Transpiration pull theory
- d* Pulsatile movemant theory

II

- p* J.C. Bose
- q* Strasburger
- r* Munch
- s* Godlewski
- t* Dixon and Joly

A. a - s, b - r, c - t, d - p

B. a - s, b - r, c - , d - t

C. a - r, b - s, c - p, d - t

D. a - r, b - s, c - t, d - p

Answer: D



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251. A cell when dipped in 0.5 M sucrose solution has no effect but when the same cell will be dipped in 0.5 M NaCl solution the cell will

A. Increase in size

B. Decrease in size

C. Becomes turgid

D. Gets plasmolyed

Answer: D



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252. Potometer works on the principle of

- A. Osmotic pressure
- B. Amount of water absorbed equal the amount transpired
- C. Root pressure
- D. Potential difference between tip of tube and that of plant

Answer: B



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253. What is true ?

- A. ABA opens stomata
- B. ABA opens stomata while cytokinin closes stomata
- C. ABA closes while cytokinin opens stomata
- D. ABA and cytokinin do not affect stomata

Answer: C



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254. Guard cells line

- A. Stomata
- B. Hydathode
- C. Pnunmatophore
- D. Lenticle

Answer: A



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255. Maximum water loss occurs through

- A. Lenticels

B. Hydathodes

C. Stomata

D. Cuticle

Answer: C



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256. Which is incorrect ?

A. $\Psi_{\omega} = \Psi_{\pi} + \Psi_p$

B. $\Psi_{\omega} = \Psi_m + \Psi_{\pi} + \Psi_p$

C. $\Psi_{\omega} = \Psi_s + \Psi_p$

D. $\Psi_{\omega} = \Psi_m + \Psi_{\pi} + \Psi_p$

Answer: D



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257. Pulsation theory was proposed by

- A. Godlewski
- B. J.C. Bose
- C. Dixon and Joly
- D. Arthur

Answer: B



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258. Water will enter a cell if it is placed in solution less concentrated than cell sap due to

- A. Endosmosis
- B. Diffusion
- C. Imbibition
- D. Plasmolysis

Answer: A



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259. Which one is responsible for opening of stomata ?

- A. Decrease in CO_2 concentration and increase in H^+ ion concentration
- B. Decrease in CO_2 concentration and decrease in H^+ ion concentration
- C. Increase in CO_2 concentration and increase in H^+ ion concentration
- D. More free H^+ ions and less Cl^- ions.

Answer: B



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260. Water is lost through hydathodes. Hydathodes

- A. Remain closed at night
- B. Remain closed during day
- C. Remain always open
- D. Remain open during day .

Answer: C



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261. Which one is correct ?

- A. $\Psi_w = \Psi_m - (\Psi_s + \Psi_p)$.
- B. $\Psi_w = \Psi_m - \Psi_s - \Psi_p$.
- C. $\Psi_w = \Psi_m + \Psi_s + \Psi_p$.
- D. $\Psi_w = \Psi_m + (\Psi_s - \Psi_p)$.

Answer: C



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262. Passive absorption of water by the root system of the result of

- A. Forces created in the cells of the root
- B. Osmotic forces in the shoot system
- C. Increased respiratory activity in cells of the root
- D. Tension in the sap due to transpiration

Answer: D



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263. Influx of K^{+} ions into guard cells and efflux of H^{+} ions from guard cells lead to

- A. Exosmosis
- B. Plasmolysis
- C. Closure in stomata
- D. Opening of stomata

Answer: D

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264. Given below are assertion and reason. Assertion. When the ambient temperature is high and the soil contains excess of water, the plants tend to lose water in the form of droplets from lenticels Reason . Root pressure regulates the rate of loss of water from lenticels .

- A. if both are true with reason being correct explanation (A),
- B. both true but reason is not correct explanation (B),
- C. Assertion is true but reason is wrong (C),
- D. both are wrong (D),

Answer: D



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265. Assertion In angiosperms, the conduction of water is more efficient because their xylem has vessels. Reason. Conduction of water by vessel elements is an active process with energy supplied by xylem parenchyma rich in mitochondria

- A. if both are true with reason being correct explanation (A),
- B. both true but reason is not correct explanation (B),
- C. Assertion is true but reason is wrong (C),
- D. both are wrong (D),

Answer: C



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266. Which ones are true and false ? (a) Positive hydrostatic pressure is called turgor pressure (b) Wall pressure exerts to prevent the increase of protoplasm size (c) Diffusion is more rapid in liquid than in gases (d) Diffusion of water through a semipermeable membrane is called imbibition (e) Osmosis is movement of substances which takes place along a diffusion gradient

A. a and b are true but c, d and e are false

B. a and c are true but b, d and e are false

C. a and d are true but b, c and e are false

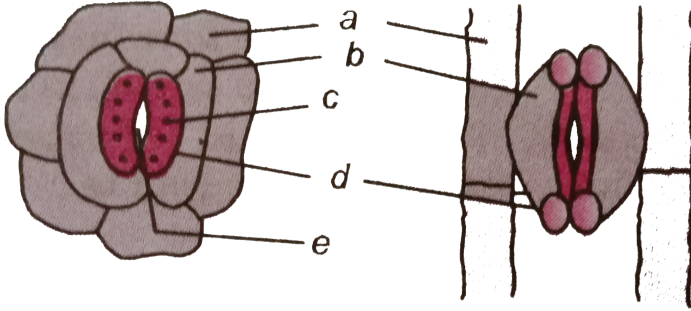
D. a and e are true but b, c and d are false

Answer: A



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267. Choose the correct combination of labelling in Potato osmoscope



- A. a - epidermal cells , b - subsidiary cells, c - chloroplast, d - stomatal aperture , e - guard cells
- B. a - epidermal cells , b - subsidiary cells, c - chloroplast, d - guard cells , e - guard cells stomatal aperture
- C. a - epidermal cells , b - guard cells, c - chloroplast, d - subsidiary cells , e - stomatal aperture
- D. a - subsidiary cells, b epidermal cells c - chloroplast, d - stomatal aperture , e - guard cells

Answer: B



268. Match the columns

<i>I</i>	<i>II</i>
<i>a</i> Diffusion	1. Hydrophilic substance
<i>b</i> Osmosis	2. Strinkage of protoplasm
<i>c</i> Imbibition	3. Semipermeable membrane
<i>d</i> Plasmolysis	4. Free movement of ions and gases

A. a - 2, b - 1, c - 4, d - 3

B. a - 3, b - 1, c - 4, d - 2

C. a - 2, b - 3, c - 4, d - 1

D. a - 4, b - 3, c - 1, d - 2

Answer: D

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269. Who is related to ascent of sap

A. Mc Clung

B. J.C. Bose

C. A. Fleming

D. J Lederberg.

Answer: B



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270. Which is incorrect

A. Rate of diffusion is directly proportional to concentration

B. Rate of diffusion is inversely proportional to distance

C. Diffusion is movement of particles from low to high electrochemical potential

D. Example of diffusion is opening of scent or ammonia in one corner

Answer: C



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271. Oozing out of water drops from injured edges or tips is

- A. Bleeding
- B. Guttation
- C. Transpiration
- D. Oozation

Answer: A



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272. Upward movement of water in plants is called

- A. Translocation
- B. Suction
- C. Flight

D. Ascent of sap .

Answer: D



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273. Rate of transpiration will increase if

A. RH increases

B. RH decreases

C. RH remains unchanged

D. Water potential gradient remains unchanged

Answer: B



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274. Select the correct ones . Apoplastic movement of water occurs exclusively through cell wall. B-Solution increase free energy of water or water potential. c-Symplastic movement occurs through plasmodesmata d- Membrane permeability depends upon membrane composition as well as chemical nature of solute

- A. a and b only
- B. b and d only
- C. a, c and d only
- D. a, b and d only

Answer: C



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275. Which is wrong

- A. Water potential is chemical potential of water

B. Solute potential is always negative

C. Pressure potential is zero in a flaccid cell

D. Water potential equal solute potential in a fully turgid cell

Answer: D



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276. What will be the effect of accumulation of K^+ ions in guard cells

A. Loss of turgidity

B. Water potential decreases

C. Exosmosis

D. Water potential increases

Answer: B



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277. Physiological demonstration of osmosis is carried out by

- A. Potometer
- B. Bell jar experiment
- C. Thistle funnel whose mouth is tied with egg membrane
- D. Thistle funnel whose mouth is tied with paper .

Answer: C



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278. Enzyme connected with opening is

- A. Pyruvic kinase
- B. Cytochrome oxidase
- C. PEP carboxylase
- D. RuBISCO.

Answer: C



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279. Guttation occurs when

- A. Wind velocity is high
- B. Humidity increases
- C. Root pressure is less and transpiration rate is more
- D. Root pressure is more and transpiration rate is less

Answer: D



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280. Plasmolysis occurs when cells are kept in

- A. Hypotonic solution

B. Hypertonic solution

C. Isotonic solution

D. None of the above

Answer: B



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281. A and B cells are contiguous. Cell A has $OP=10$ atm, $TP=7$ atm and $DPD=3$ atm. Cell B has $OP=8$ atm, $TP=3$ atm and $DPD=5$ 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

Answer: C



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282. Cell wall shows

- A. Semipermeability
- B. Differential permeability
- C. Complete permeability
- D. Impermeability

Answer: C



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283. Given below are assertion and reason. Dried seeds of Pea are kept in tin, water is poured over them upto upper level. A lid is put tight over it. Within an hour the lid is blown off Reason. Due to rapid cell division in Pea seeds

A. if both are true with reason being correct explanation (A),

B. both true but reason is not correct explanation (B),

C. Assertion true but reason is wrong (C),

D. both are wrong (D),

Answer: C



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284. Which of the following statements are not true (a) In CAM plant, stomata open during dark and remain closed during day (b) Role of Na^+ in stomata opening is now universally accepted (c) Water Potential of root cells is higher than water potential of soil (d) Capillarity theory is most accepted theory of water movement through plants (e) Wall of xylem vessels made up of lignocellulose has strong affinity for water molecules

A. a, c and e

B. b, c and d

C. a, b and c

D. b and c

Answer: B



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285. In thistle funnel experiment, if sugar is added to beaker after the stoppage of osmosis, then

A. Level of solution in beaker lowers

B. Level of solution in thistle funnel rises up

C. Level of solution remains unaffected in beaker

D. Level of solution in thistle funnel lowers.

Answer: D



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286. Starch of guard cells is converted into PEP through

- A. Hydrolysis
- B. Oxidation
- C. Dephosphorylation
- D. Decarboxylation

Answer: A



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287. Which one is most efficient imbibant ?

- A. Pectin
- B. Ager
- C. Cellulose
- D. Lignin

Answer: B



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288. Energy source responsible for upward flow of water is

- A. ATP
- B. Sucrose
- C. Solar heat
- D. Light

Answer: C



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289. In fully turgid cell

- A. Ψ_s is negative and Ψ_p is positive

B. Ψ_p is negative and Ψ_s is positive

C. Both Ψ_p and Ψ_s are positive

D. Both Ψ_s and Ψ_p are negative

Answer: A



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290. Root pressure is maximum when

A. Transpiration is very high and absorption is high

B. Transpiration is low and absorption is low

C. Transpiration is high and absorption is low

D. Transpiration is very low and absorption is low

Answer: D



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291. Guard cell regulate

- A. Respiration
- B. Transpiration
- C. Photosynthesis
- D. Photorespiration

Answer: B



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292. Which ones show physiological process called "necessary evil" (a)

Potamogeton (b) Sagittaria (c) Limnophila (d) Nymphaea

- A. b,c,d
- B. a,b,c
- C. a,b,d,
- D. a,c,d

Answer: A



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293. Water potential in closely placed cell (p, q, r) is given below . Find out correct direction of water movement

Cell	Osmotic Potential (MPa)	Pressure Potential(MPa)
p	-0.21	0.05
q	-0.22	0.02
r	-0.23	0.05

(a) $p \rightarrow q$ (b) q to r (c) r to p (d) r to q

A. a,b

B. b,c

C. a, d

D. b,d

Answer: C



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294. Ionic flux of guard cells directly connected with expenditure of energy is

- A. Outward movement of protons
- B. Outward movement of malate
- C. Inward movement of K^+
- D. Inward movement of Cl.

Answer: A



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295. Which ones regulate stomatal movements (a) IAA (b) GA_3 Zeatin (D)

ABA

- A. a,c
- B. b,c
- C. c,d

D. b,d

Answer: C



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296. Thin and elastic walls of guard cells are

A. Inner lateral

B. Inner

C. Outer

D. Outer lateral

Answer: D



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297. Colligative property is 1.Osmotic pressure 2. Vapour pressure
3.Cohesion force 4.Surface tension

A. 1,2,3

B. 1,2

C. 2,4

D. 1,3

Answer: B



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298. Water column does not repute during ascent in tracheary elements due to

A. Weak gravitational pull

B. Transpiration pull

C. Lignified thick walls

D. Cohesion and adhesion

Answer: D



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299. Stomata open when guard cells swell due to

- A. Decreased water potential
- B. Increased water potential
- C. Endosmosis by efflux of K^{+} ions
- D. Endosmosis by influx of hydrogen ions.

Answer: A



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300. Transpiration facilitates

- A. Electrolyte balance
- B. Absorption of water by roots
- C. Opening of stomata
- D. Excretion of minerals

Answer: B

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301. An RBC and a plant cell having same O.P. are placed in distilled water.

- A. None undergoes any change
- B. Plant cell swells up and bursts but there is no change in RBC
- C. RBC swells up and bursts but plant cell remains about the same size
- D. Both decrease in size and collapse.

Answer: C

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302. Which of the following would be in insignificant amount in xylem sap

- A. Water
- B. Nitrate
- C. Phosphate
- D. Suger

Answer: D



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303. Which pathway involves cell wall and intercellular spaces?

- A. Vascular pathway
- B. Protoplast pathway
- C. Symplast pathway

D. Apoplast pathway

Answer: D



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304. Efflux of K^+ and Cl^- will cause

- A. Closure of stomata
- B. Opening of stomata
- C. Increased turgidity
- D. Imbibition

Answer: A



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305. Water potential increases due to

A. Evaporation

B. Addition of solution

C. Pressure

D. Afforestation

Answer: C

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306. Most of the water flow in the root takes place via the apoplast because

A. Cortical cells are living cells

B. Cortical cells are loosely arranged

C. Cortical cells are thin walled

D. All the above

Answer: B

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307. For the same amount CO_2 fixed s C_4 plant, in comparison with a C_3 plants, lose only

- A. Half amount of water
- B. Double amount of water
- C. Equal amount of water
- D. None of the above

Answer: A

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308. In the cell walls of the guard cells, cellulose microfibrils are oriented

- A. Transversely
- B. Tangentially

C. Radially

D. Obliquely

Answer: C



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309. Gramh's law is connected with

A. Diffueion

B. Osmosis

C. Osmoregualtion

D. Absorption

Answer: A



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310. Select the correct events leading to the opening of the stomata

- (i) Decline in guard cell solutes
- (ii) Lowering of osmotic potential of guard cells
- (iii) Rise in potassium levels in guard cells
- (iv) Movement of water from neighbouring cells into guard cells
- (v) Guard cells becoming flaccid

A. a,e

B. b,c,d

C. a,c,d

D. b,d,e

Answer: B



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311. Water potentials of pure water and its solution are

A. 0 and 1

B. 0 and 0

C. 0 and more the one

D. 0 and less then one .

Answer: D

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312. Bacteria cannot survive in a highly salted pickle because

A. Salt inhibits reproduction of bacteria

B. They become plasmolysed and die

C. Nuterients in it cannot support life

D. Enough light is not available for photosynthesis.

Answer: B

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313. What happens when concentration of solutes decreases in guard cells

- A. Water potential decreases
- B. Water potential increases
- C. Osmotic pressure increases
- D. None of the above

Answer: B



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314. Force of cohesion develops due to

- A. Attraction between similar molecules
- B. Attraction between different molecules
- C. Surface tension at the interface

D. All the above

Answer: A



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315. Major loss of water in transpiration occurs through

A. Cuticle

B. Bark

C. Hydathodes

D. Stomata

Answer: D



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316. Osmotic potential and pressure potential of three cells , a,b,s located in different parts of an actively transpiring plant are

Cell	O.P (MPa)	P.P(MPa)
<i>a</i>	-0.87	0.44
<i>b</i>	-0.92	0.34
<i>c</i>	-0.68	0.27

which ones are roots hair , root cortical and mesophyll cells respectively

A. a,b,c

B. a,c,b

C. c,a,b

D. b,c,a

Answer: C



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317. The number of stomata and epidermal cells in 1 mm^2 leaf area of lower epidermis of the leaves X, Y and Z plants are given below. Arrange the plants in decreasing order of their stomatal index.

Cell	Numbers of Stomata	Numbers of epidermal cells
X	30	150
Y	60	240
Z	90	400

- A. Z,Y,X
- B. X,Y,Z
- C. Y,X,Z
- D. Y,Z,X

Answer: D

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318. Which of the following is done during ringing experiment

- A. Bark is removed

B. Xylem is removed

C. Pith is removed

D. All the above

Answer: A



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319. Glucose is not stored in plant due to

A. Decrease in osmotic pressure

B. Increases in osmotic pressure

C. Increases in turgor pressure

D. Decreases in turgor pressure

Answer: B



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320. Which is not related to transpiration pull

- A. Capillarity
- B. Adhesion
- C. Cohesion
- D. Ascent of sap

Answer: A



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321. Which of the following scientist is credited with the mechanism of opening and closing of stomata related to K^+ exchange?

- A. Levitt
- B. Sayre
- C. Scarth
- D. Lloyd

Answer: A



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322. Transpiration- cohesion tension theory operators in

- A. Active absorption
- B. Passive absorption
- C. Active and passive absorption
- D. Apoplastic movements

Answer: B



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323. Water absorption of root hairs occurs until

- A. Concentration of water in the cell sap is higher

B. Salt concentration in cell sap is higher

C. They are separated from the soil by a selectively permeable membrane

D. Water potential is lower

Answer: D

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324. According to the Steward's starch hydrolysis theory, which one of the following is the principle reason for the opening of stomata during daytime

A. Influx of K^+ ions into guard cells under influence of ABA hormone

B. Conversion of sugar into starch in guard cells

C. Efflux of K^+ ions from guard cells under the influence of ABA hormone

D. Photosynthetic utilisation of CO_2 in guard cells.

Answer: D



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325. Compare the statements a and b Statement a. To counteract the increase in turgor pressure in plant cells the cell wall produces an equal and opposite pressure, i.e., wall pressure Statement b. When plant cells undergo endosmosis, they swell but do not burst .

- A. Both the statements a and b are correct and a is reason for b
- B. Statement a is correct and b is wrong
- C. Statement a is wrong and b is correct
- D. Both the statements a and b are correct and a is not the reason for b

Answer: A



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326. Cell A and cell B are adjacent plant cells. In cell A $\Psi_s = -20$ bars and $\Psi_p = 8$ bars. In cell B, $\Psi_s = -12$ bars and $\Psi_p = 2$ bars. Then,

- A. Water moves from cell a to cell b
- B. There is no movement of water between cell a and cell b
- C. Water moves from cell b to cell a
- D. Equal amount of water is simultaneously exchanged between cell a and cell b.

Answer: C



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327. Which one is the driving force for the process of passive absorption of water in roots

- A. Root pressure
- B. Transpiration in leaves

C. Activity of aquaporins

D. Increase in imbibition pressure in root cells

Answer: B



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328. Solute Potential of a solution is always

A. 0

B. > 0

C. < 0

D. Between 0.1-1.0

Answer: B



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329. Stomata opening and closing is due to

- A. Change in turgidity of guard cell
- B. Cellulose microfibrils of guard cells are oriented radially
- C. The inner wall of each guard cell is thick and less elastic
- D. All the above

Answer: D



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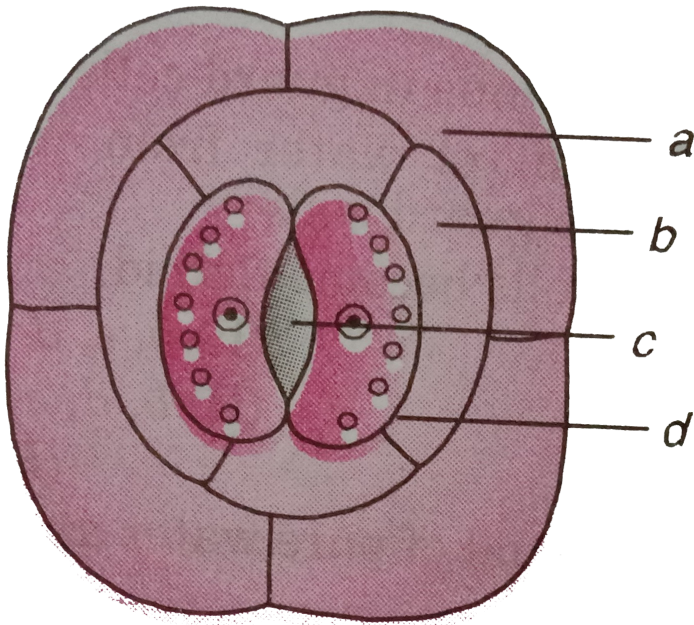
330. Attraction of water molecules to polar surfaces is known as

- A. Adhesion
- B. Tensile strength
- C. Surface tension
- D. Cohesion

Answer: A

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331. Given below is diagram of stomatal apparatus. Which option identifies labelling a, b, c, d correctly



A.

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
(A) Subsidiary cell	Epidermal cell	Guard cell	Stomatal aperture

B.

a *b* *c* *d*
(A) Guard cell Stomatal aperture Subsidiary cell Epidermal cell

C.

a *b* *c* *d*
(A) Epidermal cell Guard cell Stomatal aperture Subsidiary cell

D.

a *b* *c* *d*
(A) Epidermal cell Subsidiary cell Stomatal aperture Guard cell

Answer: D



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332. Apoplast is the system of adjacent cell walls that is continuous throughout the plant except at the

A. Plasmodesmata

B. Vessel elements

C. Casparian strips of endodermis

D. Tracheids.

Answer: C



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333. A negative effect of transpiration is

- A. Development of water stress
- B. Increase in mineral absorption
- C. Maintenance of leaf temperature
- D. Causing cooling

Answer: A



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334. What causes opening of stomata

- A. Thin wall of guard cell facing stomatal pore is stretched more, curves in and pore opens
- B. Thick wall of guard cell facing stomatal pore is stretched more, moves in and pore opens
- C. As thin wall of guard cell is stretched less, the guard cell well facing the stomatal pore moves in and pore opens
- D. Thick wall of guard cell facing the stomatal pore is stretched less, moves in and the pore opens.

Answer: D



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335. Movement of water from higher water potential to lower water potential through a semipermeable membrane is called

A. Osmosis

B. Diffusion

C. Plasmolysis

D. Imbibition

Answer: A



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336. Which of the following is not a purpose of transpiration

A. Supplies water for photosynthesis

B. Maintains shape and structure of plants

C. Helps in translocation of sugar from source to sink

D. Cools leaf surfaces

Answer: C



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337. Which of the following is a rapid type of water absorption?

- A. Active absorption
- B. Passive absorption
- C. Continuous absorption
- D. Pulsationg absorption

Answer: B



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338. Which is not directly connected with ascent fo sap?

- A. Cohesion theory
- B. Root Pressure
- C. Apoplast-symplast
- D. Capillarity

Answer: C



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339. Tracheids are less efficient than vessels due to

- A. Absence of closed and walls
- B. Uneven thickenings
- C. Casparian strips
- D. Presence of tapering end walls

Answer: D



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340. Difference between osmotic pressure and turgor pressure is

- A. DPD

B. Transpiration pull theory

C. Osmotic potential

D. Solute potential

Answer: A



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341. Whose water potential is less than water potential of root hair during water absorption (by root hair)

A. Gravitational water

B. Pure water

C. Vacuolar sap

D. Soil solution

Answer: C



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342. Water potential of water is not affected by

- A. Concentration of dissolved substances
- B. Gravitation
- C. Capillarity
- D. Atmospheric pressure .

Answer: C



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343. Accumulation of which one of the following acids results in closure of stomata

- A. Malic acid
- B. Aspartic acid
- C. PEP

D. OAA.

Answer: A



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344. 2 % $NaCl$ as compared to 18 % glucose solution is

A. Isoosmotic

B. Hypoosmotic

C. Hyperosmotic

D. None of the above

Answer: B



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345. Active absorption of water by roots from the soil is mainly affected by

- A. Tension in cell sap due to transpiration
- B. Hydrophobic nature of root hair
- C. Typical tissue organisation
- D. Osmotic concentration of xylem sap.

Answer: C



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346. The space between plasma membrane and cell wall of a plasmolysed cell surrounded by a hypertonic solution is occupied by

- A. Isotonic solution
- B. Hypotonic solution
- C. Hypertonic solution

D. Water

Answer: C



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347. Which one of the following is not an antitranspirant

A. Low viscosity resin

B. BAP

C. Silicon oil

D. PMA

Answer: B



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348. The process by which water is absorbed by solid like colloids causing them to increase in volume is

- A. plasmolysis
- B. Diffusion
- C. Osmosis
- D. Imbibition

Answer: D



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349. Which of the following get accumulated in vacuoles of guard cells during stomatal opening

- A. Water, Ca and Mg
- B. Malate, Na and K
- C. Starch, K and Cl

D. Malate, K and Cl

Answer: D

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350. Stomatal opening is influenced by

- A. N_2 concentration, CO_2 concentration and light
- B. CO_2 concentration, temperature and light
- C. N_2 concentration, light and temperature
- D. CO_2 concentration, N_2 concentration and temperature.

Answer: B

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351. Given below are assertion and reason .Assertion . Water entering a plant cell makes it turgid Reason Entry of water into cell develop wall pressure inside the cell

- A. If both are true with reason being correct explanation (A).
- B. If both are true with reason being correct explanation (A).
- C. assertion is true but reason is wrong (C)
- D. And both are wrong (D)

Answer: C

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352. Assertion . Movemant of materials inside phloem is bidirectional, both upwards and downwards Reason. Movement of molecules inside xylem is unidirectional always upwards

- A. If both are true with reason being correct explanation (A).

B. If both are true with reason being correct explanation (A).

C. assertion is true but reason is wrong (C)

D. And both are wrong (D)

Answer: B

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353. The relationship $\pi v = nRT$ is not obeyed by

A. Concentrated solution

B. Dilute solution

C. Extremely dilute solution

D. All the above

Answer: C

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354. phloem sap is mainly made of

- A. Water and sucrose
- B. Water and minerals
- C. Oligosaccharides and hormones
- D. None of the above

Answer: A



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355. Force generated by transpiration can create pressure sufficient to lift water even upto the height of

- A. 130 feet
- B. 130 metres
- C. 230 feet
- D. 230 metres

Answer: B



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356. Guttation differs from transpiration in

- A. Control by stomata
- B. Occurrence during daytime
- C. Occurrence in vapour form
- D. Occurrence in liquid form

Answer: D



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357. The ability to rise in thin tubes and Ability to resist a pulling force are respectively referred to as

A. Tensile strength and capillarity

B. Cohesion and adhesion

C. Capillarity and tensile strength

D. Adhesion and capillarity

Answer: C

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358. Which of the following is not a purpose of transpiration

A. Prevents loss of water

B. Helps in absorption and transport

C. Makes cells rigid

D. Cools leaf surfaces

Answer: A

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359. An osmometer is filled with 0.5 M solution of NaCl in water. In which of the following solutions it must be immersed in order to make it shrink

- A. 0.05 M
- B. 0.75 M
- C. 0.5 M
- D. Distilled water

Answer: B



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360. Stomata open by

- A. Increasing solution concentration in guard cells
- B. Weakening of cell walls of guard cell to allow them to stretch
- C. Increasing water potential of guard cells

D. Decreasing the solute concentration of guard cells

Answer: A



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361. Correct pathway of water movement in plant roots is

A. Soil water → Root hair cell → Passage cells → Cortical cells

→ Xylem to Pericycle

B. Soil water → Root hair cell → Pericycle → Cortical cell →

Passage cells → Xylem

C. Soil water → Root hair cell → Cortical cell → Passage cells →

pericycle → Xylem

D. Soil water → Root hair cell → Cortical cell → Pericycle →

Passage cells → Xylem

Answer: C



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362. Which growth hormone is associated with stomatal movements

- A. Auxin ABA
- B. Gibberellin
- C. Cytokinin
- D.

Answer: B



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363. For a plasmolysed cell, which equation is correct ?

- A. $DPD = OP + TP$
- B. $DPD = -TP$
- C. $DPD = OP$

D. $DPD = OP - TP$

Answer: D



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364. Identify the wrong statement

- A. Proton motive force drives the uniport
- B. Movement of NO_3^- ions in cotransport is against their own concentration gradient
- C. Azides inhibit the process of respiration
- D. ATPase serves as proton-respiration carrier protein

Answer: C



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365. Number of stomata is 30 and epidermal cells 120 per unit area of a leaf. The stomatal index is

- A. 0.05
- B. 0.5
- C. 0.2
- D. 0.02

Answer: A



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366. Match the lists and find the correct option

I

II

- | | |
|-----------------------|----------------------------|
| a. Henry Dixon | 1. Bioelectric responses |
| b. Slatyer and Taylor | 2. Cohesion-tension theory |
| c. Lavitt | 3. Active proton concept |
| d. J.C. Bose | 4. Water potential |
| | 5. Term Physiology |

A. a - 5, b - 2, c - 1, d - 3

B. $a - 2, b - 3, c - 4, d - 5$

C. $a - 5, b - 1, c - 4, d - 2$

D. $a - 5, b - 1, c - 4, d - 2$

Answer: C



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367. In stomatal opening, influx of K^+ is accompanied by efflux of

A. Na^+

B. K^+

C. Cl^-

D. H^+

Answer: C



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368. Most accepted theory for ascent of sap is

Sap ascends in woody stems because of root pressure and

- A. Capillarity theory
- B. Root Pressure theory
- C. Pulsation theory
- D. Transpiration pull theory

Answer: D



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369. Which of the following criteria does not pertain to facilitated transport

- A. Uphill transport
- B. High selectivity
- C. Transport saturation

D. Requirement of special membrane proteins .

Answer: D



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370. Passage of water through a semipermeable membrane causes

A. Suction pressure

B. Osmotic pressure

C. Turgor pressure

D. Wall Pressure

Answer: A



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371. In root apoplast path of water transport is through

A. Call wall only

B. Call wall and inter cellular spaces

C. Intercellular spaces

D. Intercellular spaces, cell walls and endodermis

Answer: C



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372. Which ions are responsible for stomatal movement

A. Ferric

B. Zinc

C. Potassium

D. Sodium

Answer: B



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373. Guttation only occurs in

- A. Hydrophytes
- B. Mesophytes
- C. Mangroves
- D. Marshy plants

Answer: C



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374. Osmotic pressure of pure water is

- A. 0
- B. 1
- C. 10

D. 100

Answer: D



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375. When turgidity is lost in guard cells the stomatal pore

- A. Remains unchanged
- B. Gets plasmolysed
- C. Becomes closed
- D. Opens fully

Answer: A



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376. A thin film of water, held by the soil particles under the influence of internal attractive force, is called which of the following water

- A. Ranaway
- B. Hygroscopic
- C. Gravitational
- D. Capillarity

Answer: C



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377. Consider the following statements and select the correct statement

Statement a. Pure water has the maximum water potential Statement b.

Osmotic potential is zero in pure water

- A. Both statements are correct and b is not the reason for a
- B. Both the statements are wrong

C. Both statements are correct and b is the reason for a

D. Both statements are correct

Answer: B



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378. What is not significant is osmosis

A. Gravitational Potential

B. Matric potential

C. Solute potential

D. pressure potential

Answer: C



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379. Pressure potential in a plasmolysed cell is

- A. Positive
- B. Zero
- C. Negative
- D. Remains same

Answer: A



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380. Maximum transpiration occurs in

- A. Mesophytes
- B. Bryophytes
- C. Thallophytes
- D. Pteridophytes

Answer: C



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381. Which factor does not contribute to stomatal opening

- A. Light Low pH
- B. Low pH
- C. Reduced CO_2
- D. Water

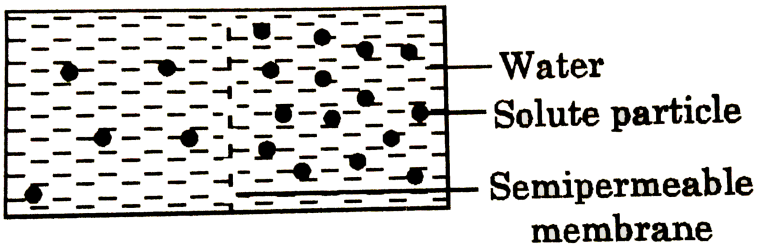
Answer: A



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382. Chambers I and II are separated by a semipermeable membrane.

Study the given figure and choose the right option



A. Chamber I has higher water potential and water will move from I to

II

B. Chamber II has lower solute potential and water will move from I to

II

C. Chamber I has higher solute potential and water will move from II

to I

D. Chamber II has lower water potential and water will move from II to

I

Answer: B



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383. Select the matched ones (i) Guttation-Water loss in liquid phase (ii) Adhesion- Mutual attraction between water molecules (iii) Imbibition- Absorption of water by dry wood (iv) Hypotonic solution-Cells shrink

A. I,ii and and iii only

B. ii and iv only

C. iii and iv only

D. I and iii only

Answer: A



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384. Which condition favours guttation

A. High humidity

B. Low humidity

C. More teranspiration

D. Bright sunlight

Answer: D



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385. Number of stomata and epidermal cells in 1mm^2 area of abaxial surface of leaves a, b, c, and d are

Plant	Number of stomata	Number of Epidermal cells
<i>a</i>	40	730
<i>b</i>	60	510
<i>c</i>	70	450
<i>d</i>	30	620

It brgt Identify

two plants having least stomatal index

A. b and c

B. a and d

C. a and c

D. a and b

Answer: A



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386. Components of water potential of four cells of an actively transpiring monocot plant are

cell	osmotic Potential	Pressure Potential
<i>a</i>	-0.9	0.5
<i>b</i>	-0.8	0.6
<i>c</i>	-0.6	0.1
<i>d</i>	-0.7	0.4

Identify the four cells as root hair, Cortical cell, endodermal and pericycle cells

A. b, c, d, a

B. b, d, c, a

C. b, d, a, c

D. a, d, b, c,

Answer: B



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387. When concentration of solute is low in plant cell, absorption of water is

- A. Raterded
- B. Increased
- C. Normal
- D. Absent

Answer: C



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388. Water potential of pure water at standard temperature is equal to

- A. 10
- B. 20
- C. 0
- D. None of the above

Answer: A



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389. In a plant cell DPD is zero when it is $\hat{\epsilon}|\hat{\epsilon}|\hat{\epsilon}!$..

A. Plasmolysed

B. Turgid

C. Flaccid

D. Incipient

Answer: C



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390. Choose the wrong statemnt

A. Cells swell in hypertonic solutions and shrink in hypotonic solution

B. Water potential is the kinetic energy of water which helps in movement of water

C. Absorption of water by seeds and dry wood takes place by special type of diffusion called imbibition

D. Ψ_s is always negative

Answer: B



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391. Osmotic expansion of a cell kept in water is chiefly regulated by

A. Vacuoles

B. Plastids

C. Ribosomes

D. Mitochondria

Answer: A



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392. The number of stomatal pores per cm^2 of leaf surface are in the range of

- A. 1000-60,000
- B. 10-1000
- C. 50,000-100,000
- D. 50-100.

Answer: A



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393. Match and find the correct combination

- | | |
|-------------------------|--|
| (a) Scotoactive stomata | (i) Opening and closing of photoactive stomata |
| (b) Guttation | (ii) Transpiration |
| (c) Tensile strength | (iii) Water loss in liquid phase |
| (d) K^+ pump theory | (iv) Night transpiration |
| | (v) Antitranspirant |

A. a - iv, b - iii, c - ii, d - i

B. a - iv, b - v, c - ii, d - iii

C. a - iii, b - iv, c - v, d - ii

D. a - iii, b - i, c - iv, d - ii

Answer: A



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394. The correct ascending sequence with respect to their water potential

is

(a) $\pi = -0.8MPa, P = +0.4MPa$

(b) $\pi = -1.0MPa, P = +0.5MPa$

(c) $\pi = -0.9MPa, P = +0.2MPa$

(d) $\pi = -0.3MPa, P = +0.2MPa$

A. a, b, c, d

B. c, b, a, d

C. c, a, b, d

D. c, d, b, a

Answer: A



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395. Find out the correct pair of statements (i) In completely plasmolysed cell, pressure potential does not contribute to water potential (ii) If a cell is placed in hypotonic solution for longer time, the cell membrane shrinks away from its cell wall (iii) Apoplastic system comprises

interconnected protoplasts (iv) Polypeptides have more imbibing capacity than polysaccharides

- A. i, iv
- B. i,ii
- C. ii, iv
- D. iii, iv.

Answer: B



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396. A column of water within xylem vessels of tall trees does not break under its weight because of

- A. Dissolved suger in water
- B. Tensile strangth of water
- C. Lignification of xylem vessels

D. Positive root pressure

Answer: B



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397. Water potential gradient between adsorbent and the liquid imbibed is essential for imbibition . In addition, for any substance to imbibe any liquid, one of the following is also a pre-requisite

- A. Affinity beteen adsorbant and the liquid
- B. Molecular density of adsorbant
- C. Concentration of adsorbant
- D. Pressure potential of the adsorbant

Answer: B



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398. Which of the following is not correct mass flow hypothesis

- A. Loading of phloem sets up a water potential gradient that facilitates the mass movement in phloem
- B. The sugar which is transported is sucrose
- C. The sugar is moved bidirectionally
- D. As hydrostatic pressure in phloem sieve tube increases, pressure flow stops and sap accumulates in phloem

Answer: A



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399. The continuity of water column in xylem is maintained due to

- A. Evaporation of water
- B. Cohesive property of water

C. Pressure of air bubbles in water

D. Small size of xylem vessels .

Answer: D



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400. Guttation is a process of loss of water in

A. Liquid form containing dissolved minerals

B. Liquid form without dissolved minerals

C. Vapour form with minerals

D. Vapour form without minerals

Answer: B



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401. The apoplast is located

- A. Outside the plasma membrane
- B. In the entire cytosol
- C. On both sides of plasma membrane
- D. In the plastidial content

Answer: A



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402. Match and find the correct option

- (a) Water potential (i) It is usually positive
- (b) Solute potential (ii) It is zero for pure water
- (c) Pressure potential (iii) It is always negative

A. a- ii, b-iii, c-i

B. a-i, b-iii, c-ii

C. a-iii, b-ii, c-i

D. a-ii, b- i, c-iii

Answer: A



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403. Which of the following statements about plasmolysis is/ are true I. Plasmolysis occurs when water moves into cell II. Cells shrink in hypotonic solution III. If the external solution balances the osmotic pressure of cytoplasm, it is said to be isotonic

A. I only

B. II only

C. III only

D. I and II only

Answer: A



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404. Above this minimum vertical distance, the gravity potential is not negligible

- A. 1 m
- B. 5 m
- C. 10 m
- D. 20 m

Answer: C



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405. Imbibition involves

- A. Solute potential
- B. Gravity potential
- C. Matric potential
- D. Pressure potential

Answer: B



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406. The major solute taken in by guard cells is Na^+

A. Na^+

B. Ca^{2+}

C. K^+

D. Mg^{2+}

Answer: C



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407. Water potential of soil quantified in term of

A. Pressure

B. Volume

C. Molar concentration

D. Molal concentration

Answer: C



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408. Identify the wrong statement

A. The degree of decrease of chemical potential of water depends on concentration of solute

B. Bacteria and fungal spores are killed when they enter into pickles and jams due to plasmolysis

C. Process of water exudation is called transpiration

D. Reverse plasmolysis will occur when flaccid cells are placed in hypotonic solution

Answer: C



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409. Find the correct pair of statements (i) Influx of Cl^- into guard cells during stomatal opening is active (ii) Entry of sucrose from companion cells into sieve tubes at source involves expenditure of energy (iii) At the sinks sucrose moves out of phloem by passive transport (iv) Efflux of K^+ from guard cells during stomatal closure does not involve energy expenditure

- A. ii,iv
- B. ii,iii
- C. i,iii
- D. iii, iv.

Answer: C



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410. Arrange the following in ascending order based on their solute concentration

Cell	Water Potential (KPa)	Pressure Potential(KPa)
(a)	-590	320
(b)	-368	623
(c)	-292	412
(d)	-481	146

A. c, a, d, b

B. d, c, a, b

C. a, c, b, d

D. b, a, c, d

Answer: B



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411. Photosynthates are translocated from source to sink organs mainly in the form of

A. Glucose

B. Fructose

C. Starch

D. Sucrose

Answer: D



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412. The movement of water and minerals in xylem and the movement of phloem sap in phloem is respectively

A. Unidirectional, bidirectional

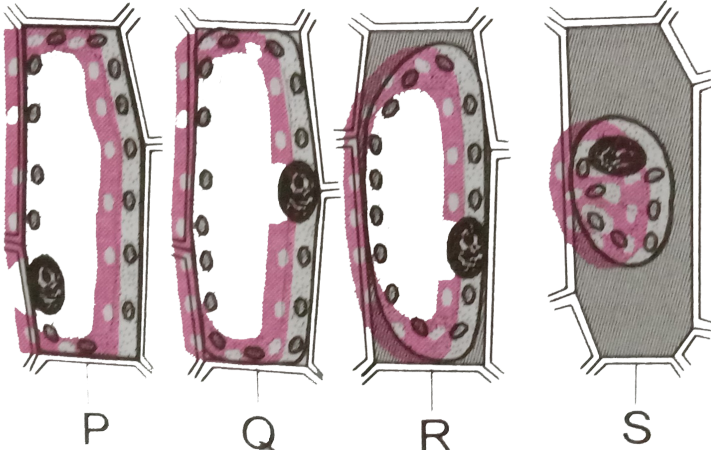
B. Bidirectional, bidirectional

C. Bidirectional, unidirectional

D. Unidirectional, unidirectional .

Answer: D

413. In the given diagram, which is the initial condition of plasmolysis



A. P

B. Q

C. R

D. S

Answer: A

414. Process of water exudation from hydathodes is known as

- A. Guttation
- B. Transpiration
- C. Evaporation
- D. Bleeding

Answer: B



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415. Apoplastic movement of water occurs exclusively through the the (i)

Intercellular spaces (ii) Walls of the cells (iii) Plasmodesmata (iv) Cytoplasm

- A. i,ii and iv
- B. iii and iv
- C. i and ii
- D. ii and iv

Answer: A



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416. In plants opening of stomata is regulated by

- A. Red light
- B. Blue light
- C. Far-red light
- D. Ultraviolet light .

Answer: C



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417. In incipient plasmolysis is

- A. Last stage of plasmolysis

B. Mid stage of plasmolysis

C. Zero hour for inception of plasmolysis

D. Intial stage of plasmolysis.

Answer: B



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418. Turgor pressure of a plant cell increases due to

A. Endosmosis

B. Exosmosis

C. Wall pressure

D. Diffusion pressure

Answer: D



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419. The movement of solvent molecules into the region of higher solute concentration through semipermeable membrane is called

- A. Imbibition
- B. Diffusion
- C. Osmosis
- D. Plasmolysis

Answer: C



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420. Which of the following equations is correct in respect of osmotic phenomenon

- A. $DPD = OP - TP$
- B. $DPD = OP + TP$
- C. $DPD = OP \times TP$

$$D. DPD = OP \div TP$$

Answer: C



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421. X and Y are adjacent living cells. The cell X has solute potential (Ψ_s) of -9 bars and pressure potential (Ψ_p) of bars whereas cell Y has solute potential (Ψ_s) of -8 bars and pressure potential (Ψ_p) of 5 bars. What will be the direction of water movement between these cells

- A. Cell X to cell Y
- B. Cell Y to cell X
- C. Does not move in any direction
- D. Moves in both directions.

Answer: A



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422. 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 the following options.

- A. One process occurs during day time and the other at night
- B. Both the processes cannot happen simultaneously
- C. Both processes can happen together because the diffusion coefficients of water vapours and CO_2 are different
- D. The above processes happen only during night time

Answer: B



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423. 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 suger
- B. Acidic
- C. Alkaline
- D. Low refractive index.

Answer: C

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424. A plasmolysed cell can be deplasmolysed by placing it in

- A. Isotonic solution
- B. Saturated solution
- C. Pure water or hypotonic solution
- D. Hypertonic solution .

Answer: C

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425. Assertion : Translocation of sugar from source to sink is defined as pressure flow hypothesis. Reason : Translocation of the solutes is facilitated through living phloem sieve tube cells

- A. If both are true with reason being correct explanation (A).
- B. both true but reason is not correct explanation (B),
- C. Assertion true but reason is wrong (C),
- D. both are wrong (D),

Answer: C



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426. Which of the following facilitates opening of stomatal aperture ?

- A. Contraction of outer wall of guard cells
- B. Decreases 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 cell

Answer:

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Check Your Grasp

1. Increase in temperature

- A. Increases osmotic pressure
- B. Decreases osmotic pressure
- C. Has no effect on osmotic pressure
- D. Causes endosmosis

Answer: A



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2. Osmotic pressure of 0.1 M sucrose solution is -2.3 bars . What is the likely osmotic potential of 0.1 M NaCl ?

- A. - 1.2 bars
- B. - 2.3 bars
- C. - 4.6 bars
- D. + 2.3 bars

Answer:



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3. plant imbibants are

- A. Hydrophilic colloids
- B. Hydrophobic colloids
- C. Stored electrolytes
- D. Stored nonelectrolytes

Answer:

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4. A positively charged colloid will imbibe maximum at

- A. 9 pH
- B. 7 pH
- C. 4 pH
- D. pH has no influence on imbibition .

Answer:

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5. Which one is used for measuring osmotic potential of living cells ?

- A. Vapour pressure
- B. Evident plasmolysis
- C. Incipient plasmolysis
- D. Limiting plasmolysis

Answer:



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6. In case T.P. is less than the minimum W.P., the cell will

- A. Undergo plasmolysis
- B. Bursts
- C. Swell and become fully turgid

D. Not become fully turgid

Answer:



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7. Osmotic pressure of a cell is zero when

A. T.P. is maximum

B. D.P.D. is maximum

C. T.P. is zero

D. Not possible .

Answer:



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8. Amount of water transpired can be known with the help of

- A. Porometer
- B. Psychrometer
- C. Conductivity meter
- D. Dendrograph

Answer:

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9. In a well watered soil, the plant show loss of turgidity during noon. It is

- A. Incipient wilting
- B. Ethylene mediated wilting
- C. Sleep disease
- D. Temporary wilting

Answer:

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10. Who proposed conversion of starch to sugar during opening of stomata.

- A. Scarth
- B. Sayre
- C. Lloyd
- D. Steward

Answer:



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11. The pH which favours hydrolysis of starch in guard cells is

- A. 3
- B. 5
- C. 7.5

D. 9.5

Answer:



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12. The hormone required for stomatal opening is

A. Auxin

B. Cytokinin

C. Abscisic acid

D. Ethylene.

Answer:



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13. Potometer and porometer were invented by

A. Francis Darwin

B. Charles Darwin

C. Ganong

D. Bose.

Answer:

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14. Margins of mature colocasia leaves appear withered/necrotic due to

A. Deficiency of a mineral

B. Excess of a mineral

C. Excessive transpiration

D. Guttation salts.

Answer:

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15. Cobalt chloride paper test for transpiration was developed by

- A. Stahl
- B. Curtis
- C. Kramer
- D. Lofffield

Answer:



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16. The term root pressure was coined by

- A. Stephen Hales
- B. Atkins
- C. Renner

D. Kramer.

Answer:



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17. What prevent wall to wall (apoplast) movement of absorbed water?

A. Osmotic apperatus of root hair cells

B. Cortical cells

C. Pericycle cells

D. Endodermal cells.

Answer:



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18. The structure present in endodermal cells of root which prevents apoparatus movement of water is

- A. Casparian strip
- B. Passage cells
- C. Central vacuoles
- D. Plasmodesmata

Answer:



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19. A cell placed in hypertonic solution will

- A. Initially get plasmolysed but later becomes turgid if actively metabolising
- B. Get plasmolysed and die
- C. Remain turgid if treated with auxin

D. All the above

Answer:



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20. A water-logged soil often causes wilting of leaves due to

- A. Nonavailability of oxygen to roots
- B. Nonabsorption water by roots
- C. Production of ethylene precursor by roots
- D. Both B and C

Answer:



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21. Who gave the imbibition theory of ascent of sap

A. Unger

B. Dixon and Joly

C. Bose

D. Godlewaki

Answer:



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22. Absorption lag appears during

A. Night

B. Noon

C. Early morning

D. Late evening

Answer:



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