



# BIOLOGY

## BOOKS - TRUEMAN BIOLOGY

### TRANSPORT IN PLANTS

#### Multiple Choice Questions

1. When castor seeds are placed in a suitable medium for germination , by which of the

following first process water enters into the seed coat ?

A. Osmosis

B. Imbibition

C. Absorption

D. Root pressure

**Answer: B**



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2. plant imbibants are

A. hydrophobic colloids

B. hydrophilic colloids

C. chitin and suberin

D. lignin like compounds

**Answer: B**



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3. When raisins ( Kismis ) are placed in water , they swell due to the process of

A. diffusion

B. guttation

C. imbibition

D. none of these

**Answer: C**



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4. Resurrection plants of Selaginella and lichens remain air dry for considerable periods because they can absorb water from the slight downpour. By which physiological process water is absorbed

A. active absorption plasmolysis

B. plasmolysis

C. Imbibition

D. osmosis

**Answer: C**





5. Mushroom buttons and grass seeds often break the asphalt and concrete pavements due to

A. diffusion pressure

B. root pressure

C. imbibition pressure

D. plasmolysis

**Answer: C**



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6. At the time of seed germination , when water is absorbed by the seeds due to imbibition , the seed coat breaks as it swells to a lesser degree than the kernel because

A. the kernel is made up of proteins, lipids and starch while the seed coat is formed of cellulose .

B. the kernel is made up of cellulose while the seed coat is made up of proteins, lipids and starch .

C. both kernel and seed coat are made up of same constituents , it depends on the nature of medium .

D. none of the above .

**Answer: A**



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7. Imbibition is always accompanied by swelling or increase in the volume of the imbibant . However , the increase in the volume of the imbibant is

A. more than the volume of water imbibed

B. same as the volume of the water imbibed

C. less than the volume of the water imbibed

D. it depends upon the type of imbibant

**Answer: C**



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**8.** Another term used to indicate imbibition pressure is

- A. matric potential
- B. absorption potential
- C. turgor potential
- D. chemical potential

**Answer: A**



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9. With the increase in temperature , the process of imbibition

A. decreases

B. increases

C. remains the same

D. no effect

**Answer: B**



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**10.** When pea seeds and wheat seeds are put in water , which of the two will imbibe more water ?

A. Wheat seeds

B. Pea seeds

C. Both will imbibe equal amount of water .

D. pea seeds imbibe water only at alkaline pH.

**Answer: B**



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**11. Imbibition involves**

A. diffusion of water

B. movement of water into imbibant through capillarity only

C. movement of water into imbibant through adsorptive as well as capillary action

D. absorption of water .

**Answer: C**



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**12.** A bottle filled with previously moistened mustard seeds and water was screw capped tightly and kept in a corner. It blew up

suddenly after about half an hour. The phenomenon involved is

A. diffusion

B. Imbibition

C. osmosis

D. D.P.D

**Answer: B**



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13. Dry wooden stakes, if driven into a small crack in a rock and then soaked, can develop enough pressure to split the rock . This pressure is developed due to

A. imbibition

B. exosmosis

C. plasmolysis

D. diffusion

**Answer: A**



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14. Maximum and minimum imbibing capacity is found in

A. Agar > Pectin > Starch > Cellulose

B. Agar > Cellulose > Protein >

Starch > Pectin > Fat

C. Cellulose > Agar > Starch > Pectin

> Fat > Protein

D. Cellulose > Protein > Pectin > Fat  
> Starch > Agar .

**Answer: A**



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**15.** The  $\psi_w$  of imbibants is

A. highly negative

B. highly positive

C. zero

D. always positive

**Answer: A**



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**16.** When a bottle of scent or ammonia is opened in one corner of a room, it can be smelled at the farthest corner after sometime due to the process of diffusion . At this stage , an equilibrium is reached due to the same concentration in space . At this point .

A. the movement of particles stops

B. the movement of particles continues

C. the movement of particles becomes very  
fast

D. none of the above .

**Answer: B**



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17. The relative rates of diffusion of substances are

A. inversely proportional to the square root of their densities

B. directly proportional to the square root of their densities .

C. there is no relation between diffusion and density

D. independent of the density of medium

**Answer: A**



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**18.** The rate of diffusion is dependent upon the permeability of the medium , it however ,

A. influences the final equilibrium of diffusion as it is never reached if the medium is dense

B. does influence the final equilibrium of  
diffusion

C. does not influence the final equilibrium  
of diffusion

D. none of the above .

**Answer: C**



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**19.** The translocation of substances inside a cell and over short distances in the symplast is due to the process of

A. Osmosis

B. Imbibition

C. diffusion

D. none of the above .

**Answer: C**



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20. The diffusion pressure of an individual substance during independent diffusion is known as

A. diffusion pressure

B. partial pressure

C. osmotic pressure

D. turgor pressure

**Answer: B**



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21. Selectively (differentially ) permeable membrane is that which allows

A. all the solute particles to pass through it

B. none of the solute particles to pass through it

C. some of the solute particles to pass through it and prevent others

D. all the solute particles to pass through it in the beginning for 5-10 minutes , then

the rate declines

**Answer: C**



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**22.** The membrane which allows only water molecules to pass through it and no solute molecules is called

A. semipermeable membrane

B. selectively permeable

C. impermeable membrane

D. permeable membrane

**Answer: A**



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**23.** The value of osmotic potential of an electrolyte is always

A. more than non electrolyte

B. less than non electrolyte

C. same as non electrolyte

D. none of the above .

**Answer: A**



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**24.** The plasmalmma of the cell is a

A. fully permeable membrane

B. selectively permeable membrane

C. semipermeable membrane

D. impermeable membrane

**Answer: B**



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**25.** The main difference in DPD and  $\Psi_W$  is

A. DPD has negative and  $\Psi_W$  has positive value.

B. DPD depends on concentration of solvent whereas  $\Psi_W$  on concentration of

solute.

C. The direction of movement is from low

DPD to high DPD but in  $\Psi_W$  it is from

high  $\Psi_W$  to low  $\Psi_W$  .

D. All of the above .

**Answer: C**



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26. When a flaccid cell (e.g., grape raisine ) is placed in water

- A. its OP increases
- B. its TP increases
- C. its DPD increases
- D. All of the above .

**Answer: B**



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27. Which has maximum diffusion pressure ?

A. Water

B. Distilled water

C. 1 M sugar solution

D. 1 M NaCl solution

**Answer: B**



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**28.** Which cell has maximum diffusion pressure deficit ?

A. Falcid cell

B. Turgid cell

C. Prokaryotic cell

D. Eukaryotic cell

**Answer: A**



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## 29. Cell sap is

A. a dilute solution of minerals and some organic substances in the vacuole.

B. a dilute solution of minerals in water absorbed by the plant from the soil .

C. exudate from the cell

D. a solution of different organic substances dissolved in the cytoplasm.

**Answer: A**



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**30.** A cell placed in 0.5 M sugar solution was found to be with no change in cell volume. If the same cell is placed in 0.5 M of sodium chloride solution , then there will be

- A. increase in cell volume
- B. decrease in cell volume
- C. no change in volume
- D. bursting of the cell

**Answer: B**



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**31.** When osmotic pressure becomes equal to the wall pressure, then

- A. flow of water will be inside the cell
- B. flow of water will be outside the cell
- C. there will be no net flow of water
- D. none of the above .

**Answer: C**



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**32.** 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. B to A,C,D

B. A to D,B,C

C. C to A,B,D

D. A to B,C,D

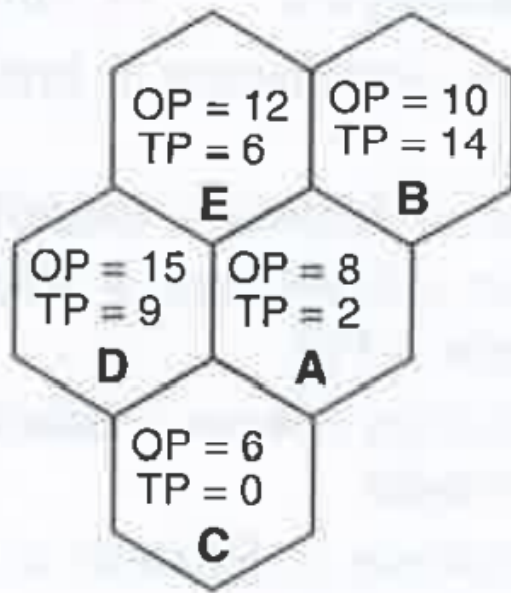
**Answer: A**



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**33.** In this diagram , when the TP of cell B decreases to 10 , what would be changes with

regard to water movement ?



- A. Cells A,C,D,E absorb water from B .
- B. Water diffuses into B from outer cell.
- C. B actively absorbes water from neighbouring cells
- D. No movement of water will occur .



**Answer: A**



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**34.** If in an osmotic system, one chamber (A) has  $\Psi_w - 2000KP_a$  while the other (B) has  $-1000 KP_a$ , which chamber has dilute solution ?

A. Chamber A

B. Chamber B.

C. Both chambers have equal concentration.

D. Data insufficient

**Answer: B**



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**35.** When certain solute particles are added to the pure solvent the diffusion pressure of resulting solution is lowered by an amount expressed in term of

A. Turgor pressure (T.P.)

B. Diffusion pressure (D.P.)

C. Osmotic pressure (O.P.)

D. Diffusion pressure deficit (D.P.D.)

**Answer:**



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**36.** A cell will absorb water and show deplasmolysis when it is immersed in

- A. isotonic solution
- B. hypertonic solution
- C. hypotonic solution
- D. any of the above

**Answer: C**



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**37.** The value of osmotic pressure becomes equal to turgor pressure when a cell is placed in a

A. hypertonic solution

B. hypotonic solution

C. isotonic solution

D. both (1) and (2)

**Answer: B**



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**38.** The equal of osmotic pressure becomes equal to diffusion pressure deficit when a cell is placed in a

A. hypertonic solution

B. hypotonic solution

C. isotonic solution

D. both (2) and (3)

**Answer: A**



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**39.** The simple phenomenon of shrinkage of the protoplasm from the cell wall under the

action of some strong solution ( than that of the cell sap ) is due to decrease in

- A. root pressure
- B. turgor pressure
- C. DPD
- D. osmotic pressure

**Answer: B**



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40. The diffusion pressure deficit of a cell protoplasm is equal to

A. wall pressure

B. turgor pressure

C. osmotic pressure

D. suction pressure

**Answer: D**



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41. The osmotic pressure of pure and clean water is

A. 0

B. 1

C. 2

D. 10

**Answer: A**



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42. Which of the following has the higher water potential ?

A. 1M salt solution

B. 1 M sugar solution

C. Distilled water

D. All have equal water potential

**Answer: C**



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43. 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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**44.** An osmotically active substance is that which can

A. cause osmotic entry of some solutes

into it

B. cause osmotic entry of solutes as well as

solvent into it

C. cause an osmotic entry of water into it

D. all are correct

**Answer: C**



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**45.** The relationship of DPD , to OP , TP and WP is

- A.  $DPD = OP - TP(WP)$
- B.  $DPD = -OP + TP(WP)$
- C.  $DPD = OP + TP(WP)$
- D.  $DPD = -OP - WP(TP)$

**Answer: A**



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**46.** 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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**47.** The potential energy of water is referred to as

- A. water potential
- B. osmotic potential
- C. gravity of potential
- D. pressure potential

**Answer: A**



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**48.** Addition of a solute to pure water causes

- A. negative water potential
- B. more negative water potential
- C. positive water potential
- D. more positive water potential

**Answer: A**





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**49.** Water potential and osmotic potential of pure water are

A. zero and 100

B. zero and zero

C. 10 and zero

D. 100 and 100

**Answer: C**



Cell A	Cell B
$\Psi_w = -1200 \text{ kPa}$	$\Psi_w = -800 \text{ kPa}$
$\Psi_s = -2000 \text{ kPa}$	$\Psi_s = -1400 \text{ kPa}$

50.

What would be  $\Psi_P$  in cell A and cell B respectively ?

- A. + 800, + 600kPa
- B. - 1000, - 600kPa
- C. + 3200, + 2200kPa
- D. - 800, - 600kPa

**Answer: A**



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51. Cell A has osmotic potential of -18 bars and pressure potential of 8 bars, whereas, cell B has osmotic potential of -14 bars and pressure potential 2 bars. The direction of flow of water will be

A. A to B

B. No movement

C. B to A

D. Equal movement in both direction.

**Answer: C**



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**52.** If a cell loses water its D.P.D.

A. decreases

B. increases

C. remains same

D. either (1) and (2)

**Answer: B**



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**53.** A cell 'A' has  $\Psi_W = -18$  bars and its adjacent cell 'B' has a water potential to -23 bars . Which cell has higher  $\Psi_W$  and what will be the direction of movement of water is

A. cell A p, from B to A

B. cell A , from A to B

C. cell B, in either direction

D. cell B , no net movement

**Answer: B**



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**54.** Whter potential of a solution is always

A. less than zero

B. zero

C. more than zero

D. unity

**Answer: A**



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**55. When the cell is turgid**

A.  $\Psi_P > \Psi_S$

B.  $\Psi_P < \Psi_S$

C.  $\Psi_P = \Psi_S$

D.  $\Psi_P \neq \Psi_S$

**Answer: C**



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**56.** Reduction of water potential due to presence of solute is

A. turgor potential

B. matric potential

C. pressure potential



## D. osmotic potential

**Answer: D**



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57. If a plant cell has  $\Psi_S$  value of -10 bar and  $\Psi_P$  value of +5 bar ,its water potential ( $\Psi_W$ ) will be

A. + 5 bar

B. - 5 bar

C. + 15 bar

D. – 50 bar

**Answer: B**



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**58. 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. all are correct

**Answer: B**



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**59.** Plant cells do not burst in distilled water because

A. cell wall is elastic , rigid and gets stretched

B. cell wall is living

C. cell wall is the outermost layer in plant cell

D. cell wall is permeable

**Answer: A**



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**60.** If cell (A) with  $OP = 5$  and  $TP = 4$  is surrounded by cells with  $OP = 3$  and  $TP = 1$ , what will be the direction of water movement ?

A. From cell A to other cells

B. From other cells to cell A

C. Water will not move

D. Water will move in both the directions in  
equal amounts

**Answer: A**



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61. The actual pressure with which water enters into the cell is called

A. DPD has negative and  $\Psi_W$  has positive value.

B. OP

C. WP

D. Diffusion

**Answer: A**



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**62.** If the plant cell is immersed in water , the water continues to enter the cell until the

A. concentration of salts is the same inside the cell as outside

B. cell bursts

C. diffusion pressure deficit is the same inside the cell as outside

D. concentration of water is the same inside the cell as outside

**Answer: C**



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**63.** A cleaned goat bladder is filled with a syrup tied and immersed in water . The volume of syrup or liquid within the bladder will

- A. increase
- B. decrease
- C. remains the same
- D. undergo plasmolysis .



**Answer: A**



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**64.** Bacteria can not survive in a highly salted pickle because

- A. salt inhibits their multiplication
- B. they get plamolysed and die
- C. nutrients in pickle cannot support life
- D. no photosynthesis occurs in pickle

**Answer: B**



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**65.** The purple cabbage leaves do not lose their colour in cold water but do so in the boiling water because

- A. hot water enters the cell faster
- B. pigment is not soluble in cold water
- C. hot water destroys the cell walls

D. hot water kills plasmalemma and makes it permeable

**Answer: D**



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**66.** Which is possible for a fully turgid cell ?

A.  $DPD = 10 \text{ atm}$ ,  $OP = 15 \text{ atm}$ ,  $TP = 5 \text{ atm}$

B.  $DPD = 0.2 \text{ atm}$ ,  $OP = 0.7 \text{ atm}$ ,  $TP = 0.5 \text{ atm}$

C.  $DPD = 0.0 \text{ atm}$ ,  $OP = 15 \text{ atm}$ ,  $TP = 15 \text{ atm}$

D.  $DPD=5\text{atm}$  ,  $OP=12\text{ atm}$  ,  $TP=7\text{ atm}$

**Answer: C**



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**67.** The plants that send their roots upto fringe of the water table due to the deficiency of air are called

A. hyrophytes

B. phreatophytes

C. mesophytes

D. halophytes

**Answer: B**



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**68.** Root hairs absorb water when

A. transpiration is low

B. soil solution is isotonic

C. salt concentration of cell sap is high

D. salt concentration of soil is high.

**Answer: C**



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**69.** The root hairs absorb from soil

A. percolating water

B. capillary water

C. hygroscopic water surrounding each soil  
particle

D. water from the water table

**Answer: B**



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**70.** In submerged hydrophytes, the absorption of water takes place through

A. root

B. stem

C. leaf

D. general surface of plant .

**Answer: D**



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71. The water available to the plant for absorption is

A. Gravitational water

B. hygroscopic water

C. Capillary water



D. Chemically bound water

**Answer: B**



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**72.** Bulk of water requirement of plant is met through the process of

- A. active absorption
- B. passive absorption
- C. root pressure

D. imbibition

**Answer: B**



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**73.** Plasmodesmata connections help in movement of substances between cells . They form

A. apoplast

B. symplast

C. cytoplasmic streaming

D. all of these

**Answer: B**



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**74.** Cold soils are considered to be

A. physically dry

B. heavy soils

C. physiologically dry

D. acidic soils

**Answer: C**



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**75.** A water - logged soil is considered to be physiologically dry because of

A. decreased viscosity of water

B. increased viscosity of water

C. abundance of salts

D. anaerobic conditions

**Answer: D**



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**76.** Which is influenced by opening and closing of stomata ?

A. Active water absorption

B. Passive water absorption

C. Guttation

D. Rate of growth

**Answer: B**



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77. During passive absorption of water , the forces originate in

A. root itself

B. shoot

C. both root and shoot

D. apical bud

**Answer: B**



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**78. Mark the correct statement .**

A. Passive absorption of water continues day and night and in all seasons.

B. Passive absorption of water occurs during the day and stops at night in all

seasons.

C. Passive absorption of water occurs during the night and stops during the day time in all seasons.

D. Passive absorption of water is maximum during morning and evening in all seasons .

**Answer: A**



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79. The influence of metabolic inhibitors on the process of passive absorption of water is

A. little and that too indirect

B. little and direct effect

C. strong and indirect

D. strong and direct

**Answer: A**



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**80.** The rate of water absorption is considered to be approximately equal to the rate of

A. photosynthesis

B. transpiration

C. respiration

D. guttation

**Answer: B**



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**81.** When soils are deficient in oxygen and have high proportion of salts or toxic substances the process of active absorption

- A. increases
- B. remains unaffected
- C. decreases
- D. stops

**Answer: C**



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**82.** Root pressure occurs due to

A. low DPD of leaves

B. high DPD of leaves

C. osmotic flow of water into xylem and  
absorbing part of root

D. imbibitional flow of water into xylem of  
absorbing part of root .

**Answer: C**



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**83.** To develop root pressure , energy is used to

A. actively transport minerals into root cells

B. evaporate water in the leaves

C. condense water in the xylem

D. create suction in the xylem.

**Answer: A**



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**84.** Root pressure is maximum when

A. absorption is high but transpiration is

low

B. absorption is low but transpiration is

high

C. both absorption and transpiration is

high

D. both absorption and transpiration is low.

**Answer: A**



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**85.** When aerial parts of a plant are cut the sap exudes from the root with a force , the phenomenon underlying this is

A. imbibition pressure

B. root pressure

C. osmotic pressure

D. capillary force

**Answer: B**



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**86.** The energy source that mainly drives the upward flow of water is

A. light



B. sucrose

C. solar heat

D. glucose

**Answer: C**



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**87.** According to Dixon and Joly's Cohesion

Theory the channel for ascent of sap is

A. xylem parenchyma

B. lumen of vessels and tracheids of xylem

C. xylem fibre

D. cortical cells

**Answer: B**



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**88.** In a branch cut from a rapidly transpiring plant , water snaps away from the cut end . It shows that

A. it is under tension

B. it is in excess in vessels

C. it has been absorbed by capillary force

D. it has been absorbed by imbibition force.

**Answer: A**



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**89.** The osmotic pressure of the leaf cells is maximum in the afternoon, this shows relation with the

- A. high rate of respiration
- B. high rate of photosynthesis
- C. high rate of fat metabolism
- D. upward movement of water in plants

**Answer: D**



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**90.** Root pressure does not take an active part in the ascent of sap because

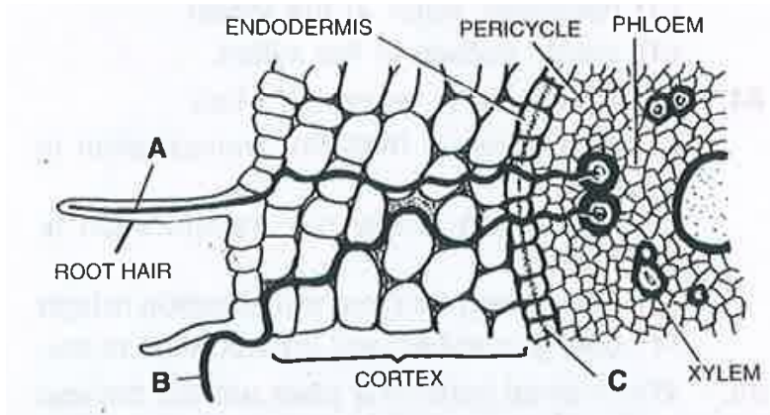
- A. it is not found in all the plants and water can rise in the absence of roots .
- B. it is seen during most favourable periods like spring or rainy season.
- C. it is never found to exist in the plants .
- D. (1) and (2) are correct.

**Answer: D**



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91. In the given TS of root , what part A,B and C



A. A-Symplast , B-Apoplast , C-Casparian strip

B. A-Apoplast , B-Symplast , C-Endodermis

C. A-Vascular path , B- membrane path-  
way , C-pericycle

D. A-Transmembrane , B-Capillary , C-

Endodermis

**Answer: A**



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**92.** Cohesion transpiration pull theory

operates in

A. passive water absorption

B. active water absorption

C. conditions favouring guttation

D. conditions restricting transpiration

**Answer: A**



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**93.** Which contributes most to the transport of water from the soil to the leaves of a tree ?

A. Root pressure

B. Cohesion of water and transpiration pull



C. Capillary rise of water inside xylem

D. Hydrolysis of ATP

**Answer: B**



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**94.** Movement of  $H_2O$  through cell wall is called

A. Symplast

B. Apoplast

C. Tonoplast

D. All of these

**Answer: B**



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**95. Water lost by transpiration is**

A. pure water

B. rich in dissolved salts

C. rich in dissolved minerals

D. none of the above .

**Answer: A**



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**96.** Cobalt chloride is blue in anhydrous state .

In contact with water vapours it turns

A. red

B. violet

C. pink

D. yellow

**Answer: C**



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**97.** Which of the following amphistomatous leaves would dry up last ?

A. Both surfaces ungreased

B. Both surfaces greased

C. Upper surface greased

D. Lower surfaces greased

**Answer: B**



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**98.** Sunken stomata are mainly seen in leaves of

A. hydrophytes

B. xerophytes

C. mesophytes

D. epiphytes

**Answer: B**



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**99.** In terrestrial habitats , temperature and rain fall conditions are influenced by

A. photoperiodism

B. transpiration

C. thermoperiodism

D. translocation

**Answer: B**



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**100.** Main function of lenticel is

A. transpiration

B. guttation

C. gaseous exchange

D. translation

**Answer: C**



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**101.** Apart from stomata through which other way can oxygen enter the plants ?

- A. Through leaf tips
- B. Through a hole in the stem
- C. Through lenticel
- D. Through scars on the leaves



**Answer: C**



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**102.** Transpiration in plants is

- A. not very important
- B. immaterial for them
- C. a serious burden
- D. a necessary evil

**Answer: D**



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**103.** Transpiration from the plants would be most rapid when

A. there is lot of humidity in the atmosphere

B. the air is still

C. there is excess of water in the sky

D. environmental conditions are dry

**Answer: D**



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**104.** When stomata open only at night they are called

A. photoactive

B. scotoactive

C. nyctinastic

D. helioactive

**Answer: B**



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**105.** Which of the following is not a function of transpiration ?

- A. Cooling of leaves
- B. Uptake of minerals
- C. Excretion of minerals
- D. Uptake of water

**Answer: C**



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**106.** The high amount of malate in guard cells of open stomata accumulates by the hydrolysis of

A. glucose

B. lignin

C. cellulose

D. starch

**Answer: D**



**Watch Video Solution**

**107.** The lowest water potentials in the xylem are in the

- A. root hairs
- B. vascular cylinders of roots
- C. tracheids of the stem
- D. transpiring leaves .

**Answer: D**



**Watch Video Solution**

**108.** Transpiration rate of a dorsiventral leaf is

- A. higher on the lower surface
- B. higher on the upper surface
- C. equal on both the surfaces
- D. dependent upon species.

**Answer: A**



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

- A. permanent wilting
- B. temporary wilting
- C. incipient wilting
- D. none of the above

**Answer: C**





**110.** Permanent wilting can be over come by

- A. increasing relative humidity
- B. supplying water to the soil around the  
plant
- C. supplying antitranspirants
- D. All of the above .

**Answer: D**



**111.** Wilting occurs when

A. rate of transpiration is higher than absorption

B. rate of absorption is higher than transpiration

C. excess root pressure

D. high relative humidity of air

**Answer: A**



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**112.** Which is incorrect for wilting ?

A. It occurs in woody parts

B. It occurs in herbaceous plants.

C. Older leaves usually wilt before younger  
leaves

D. All of the above .

**Answer: A**



**113.** Mark the correct statement .

A. The osmotic pressure of guard cells is highest when the stomata are open and the lowest when the stomata are closed.

B. The osmotic pressure of guard cells is lowest when the stomata are open and the highest when the stomata are closed.

C. The osmotic pressure of guard cells and epidermal cells surrounding it never matters for the opening of stomata .

D. (2) and (3) are correct

**Answer: B**



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**114.** The hormone which promotes the outflow of potassium from guard cells is

A. IAA

B. gibberellins

C. ethylene

D. abscisic acid

**Answer: D**



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**115.** The hormones which help in the intake of  $K^+$  ions by guard cells and hence speed up the opening of stomata are

A. cytokinins

B. auxins

C. gibberellins

D. ethylene

**Answer: A**



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**116.** A leaf with hair on its surface

A. increases transpiration

B. reduces transpiration

C. reduces guttation

D. reduces exchange of gases .

**Answer: B**



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**117.** Excess of  $CO_2$  in the plant will

A. enhance the transpiration

B. reduces the transpiration



C. have no effect

D. reduce transpiration provided the temperature is  $25^{\circ}C$

**Answer: B**



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**118.** Smaller plants lose more water per unit of leaf area as compared to the larger plants due to

A. high root Shoot ratio in former

B. low Root Shoot ratio in former

C. more stomatal frequency

D. value of stomatal index is high .

**Answer: A**



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**119.** Which one will reduce rate of transpiration ?

- A. Rise in temperature .
- B. Increase in water uptake .
- C. Decrease in relative humidity .
- D. Decrease in light intensity

**Answer: D**



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**120.** A passive hydathode comprises a group of loosely arranged colourless and parenchymatous cells known as

A. spongy parenchyma

B. aerenchyma

C. apithem

D. prosenchyma

**Answer: C**



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**121.** Root pressure development is responsible for a physiological process occurring

frequently in the morning after a moist and warm night, it is called

- A. guttation
- B. bleeding
- C. exudation
- D. transpiration

**Answer: A**



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122. The water that comes out during guttation is

A. a solution containing many organic and inorganic substances

B. a solution containing organic substances

C. a solution containing inorganic substances

D. pure water .

**Answer: A**



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**123.** Which is the most important factor in regulation of transpiration

A. Temperature

B. Humidity

C. Light

D. Wind

**Answer: A**



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## **124. Antitranspirants**

A. reduce the rate of transpiration without affecting carbon assimilation

B. reduce the rate of transpiration affecting carbon assimilation



C. reduce the rate of transpiration

affecting growth of plant

D. reduce the rate of transpiration

affecting protein synthesis of plant.

**Answer: A**



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**125.** Spraying the plant surfaces with silicon emulsion and phenyl mercuric acetate results in

- A. increased transpiration
- B. decrease in transpiration
- C. increase in photosynthesis
- D. increase in respiration

**Answer: B**



**Watch Video Solution**

**126.** Percentage of water left in the soil when plant wilts is known as

A. chresard

B. wilting coefficient

C. field capacity

D. holard

**Answer: B**



**Watch Video Solution**

**127.** What is the action spectrum of transpiration ?

A. Green and ultra violet

B. Orange and red

C. Blue and far red

D. Blue and red

**Answer: D**



**Watch Video Solution**

**128.** Which is produced during water stress that brings stomatal closure?

A. ethylene

B. Abscisic acid

C. ferulic acid

D. Coumarin

**Answer: B**



**Watch Video Solution**

**129.** An important factor in stomata opening is

A. hormone content of cells

B. protein content of cells

C. chlorophyll content of cells

D. shape of guard cells

**Answer: D**



**Watch Video Solution**

**130.** Which of the following wall of guard cells is thick

A. Lateral

B. Inner (ventral concave )

C. Outer ( dorsal convex )

D. All of these

**Answer: B**



**Watch Video Solution**

**131.** What shall be the sequence of events during wilting of a plant

A. Endosmosis → Plasmolysis →

Temporary wilting → Permanent  
wilting

B. Exosmosis → Plasmolysis →

Temporary wilting → Permanent  
wilting

C. Exosmosis → Imbibition →

Plasmolysis → Temporary wilting  
→ Permanent wilting



D. Exosmosis → Plasmolysis →

Deplasmolysis → Temporary wilting

→ Permanent wilting

**Answer: B**



**Watch Video Solution**

**132.** Conversion of starch to organic acids is required for

A. stomatal opening

B. stomatal closure

C. stomal formation

D. hydrothode functioning

**Answer: A**



**Watch Video Solution**

**133.** Enzyme connected with opening and closing of stomata is

A. Rubisco

B. PEP carboxylase

C.  $\alpha$ - amylase

D. pyruvic kinase

**Answer: B**



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### 134. Match the apparatus with function

- |                 |   |
|-----------------|---|
| a. Porometer    | i. Apparatus used for measuring the rate of transpiration |
| b. Potometer    | ii. Instrument for measuring relative humidity            |
| c. Manometer    | iii. Apparatus used for knowing relative size of stomata  |
| d. Psychrometer | iv. Instrument used for measuring pressure                |

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

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

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

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

**Answer: B**



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**135.** Lenticels and hydathodes are small pores with following common attributes

- A. they remain open
- B. they allow exchange of gases
- C. they always remain closed

D. they are found on the same organs of  
plants

**Answer: A**



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**136.** Epithem is

A. associated with guttation

B. a group of loosely arranged green  
parenchymatous cells

C. found over the tip of a petiole

D. all of the above .

**Answer: A**



**Watch Video Solution**

**137.** Epidermal cells containing chloroplasts are

A. Hydathode

B. Stomata

C. Guard cell

D. Epithem

**Answer: C**



**Watch Video Solution**

**138.** Match the experiment listed under Column I with the aim of the experiment in



## Column II.

<i>Column I</i>	<i>Column II</i>
a. Girdling experiment	p. active transport
b. Cobalt chloride paper method	q. mass flow hypothesis
c. Carrier protein	r. unequal transpiration on leaf surfaces
d. Munch	s. translocation in phloem

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

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

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

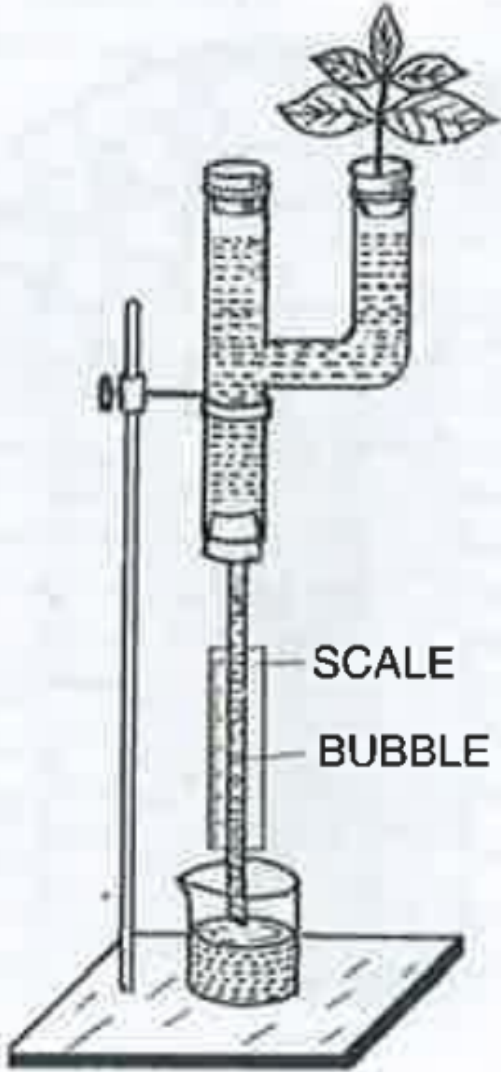
D.  $a=q, b=p, c=s, d=r$

**Answer: B**



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**139.** The experiment set up shown in the following diagram is for



A. the demonstration of apoplastic pathway

B. measuring the rate of transpiration

C. the demonstration of mass flow

D. the demonstration of anaerobic  
respiration

**Answer: B**



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**140.** In which of the following plants , there will be no transpiration ?

A. Aquatic , submerged plants

B. Plants living in plains

C. Aquatic plants with floating leaves

D. Plants growing in hilly regions

**Answer: A**



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

A. bleeding

B. guttation

C. transpiration

D. oozation

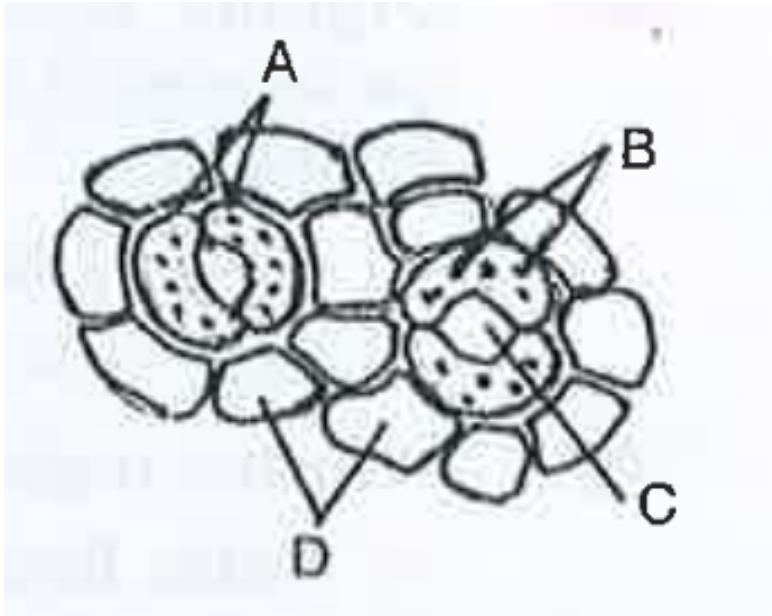
**Answer: A**



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**142.** The following figure shows the stomatal apparatus . Identify the parts labelled as A,B,C and D . Choose the correct answer from the

following



A. A=Guard cells , B=Stoma, C=Chroloplasts ,  
D=Subsidiary cells

B. A=Subsidiary cells , B=Chloroplasts ,  
C=Stoma, D=Guard cells

C. A=Guard cells, B=Chloroplasts, C=Stoma,

D=subsidiary cells

D. A=subsidiary cells, B=Stoma, C=

Chloroplasts , D=Guard cells

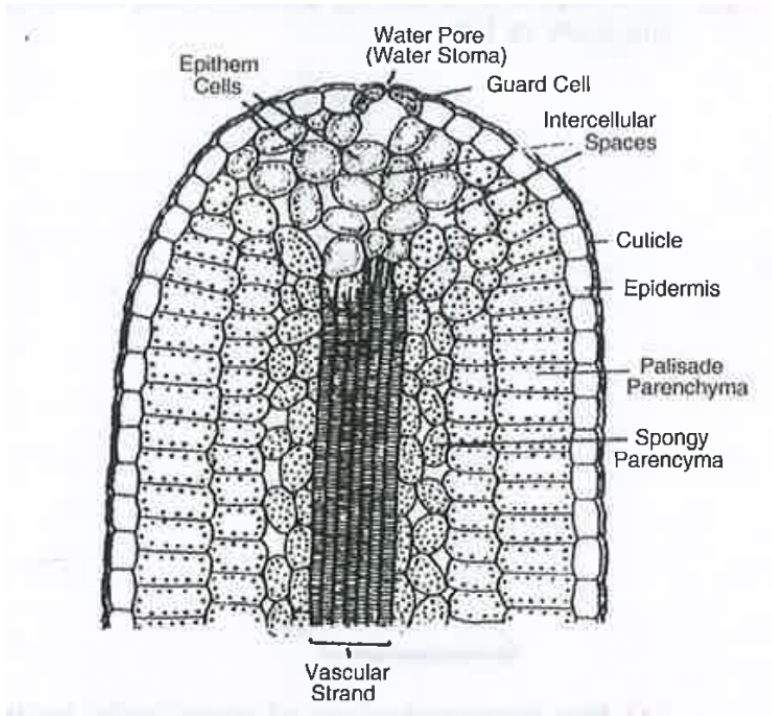
**Answer: C**



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143. The given diagram is of



A. Hydathode

B. Stomata

C. Lenticel

D. Porometer

**Answer: A**



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**144.** At the time of active growth ( formation of buds and flowers ) a part of the stored food also moves upward through

A. xylem

B. phloem

C. parenchyma

D. both xylem and phloem

**Answer: A**



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**145.** For conducting girdling experiments

A. the cortex is removed

B. the cortex and primary phloem and  
removed

C. all tissues upto secondary xylem are removed

D. none of the above

**Answer: C**



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**146.** Organic substances such as sugars are translocated in the phloem. It can be demonstrated by

A. defoliation

B. ringing the stem

C. root pressure

D. grafting

**Answer: B**



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**147.** Munch's mass flow hypothesis explains

A. water flow in xylem

B. horizontal flow of water from cortex to xylem

C. translocation of solutes through phloem

D. absorption of water by roots .

**Answer: C**



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**148.** Loading of phloem is related to

A. increase of sugar in phloem

B. elongation of phloem cells

C. separation of phloem parenchyma

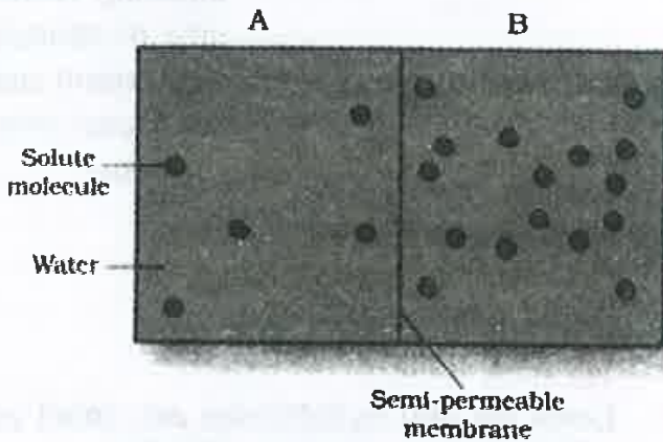
D. strengthening of phloem fibres

**Answer: A**



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149. Given below is a figure of solution A & B .



Which of the following are true for solution B

- (i) Solution B has a higher water potential
- (ii) Solution B has lower solute potential
- (iii) Solution B has higher DPD
- (iv) Solution B has lower OP
- (v) Its  $\Psi_s$  has a negative value



A. (i),(ii),(iv) & (v)

B. (ii),(iii) & (v)

C. (i),(ii),(iii) & (iv)

D. (i),(iii) & (iv)

**Answer: B**



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**150.** Given below some properties of transport mechanism. Which of these are true for the facilitated transport

(i) Require ATP energy

(ii) Highly selective

(iii) Uphill transport

(iv) Requires special membrane proteins

(v) Transport saturates

A. (i),(ii),(iii) ,(iv)

B. (ii),(iv),(v)

C. (i),(iii),(v)

D. (ii),(iii),(iv),(v)

**Answer: B**



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

A. Low transpiration

B. Excessive transpiration

C. Guttation

D. All of the above .

**Answer: C**



**152.** Most of the water lost by the plant through transpiration exist through the stomatal pores . Which of the following statements about transpiration and stomatal functioning is false ?

A. Stomata normally open in response to a shift from dark to light conditions

B. When the turgor pressure of guard cells increases , the stomatal aperture opens

C. With the shift from dark to light , the osmotic potential becomes less negative resulting in stomatal closure

D. The turgor pressure of guard cells increases after the osmotic potential becomes more negative

**Answer: C**



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**153.** Consider the following statements

1. Xylem vessels are semi-permeable
2. Sieve tubes translocate only solutes
3. Xylem vessels do not have a turgor pressure
4. Companion cells help in maintaining pressure gradient in the sieve tubes .

Which of the statements given above are correct ?

A. 1 and 2

B. 2 and 3

C. 1 and 3

D. 2 and 4

**Answer: D**



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**154.** Consider the following events involved in stomatal opening

1. Turgor pressure of guard cells increases
2.  $K^+$  ions move into guard cells
3. Formation of malic acid
4. Water moves into guard cells

What is the correct sequence of these events leading to opening of stomata ?

A. 2-4-3-1

B. 3-2-4-1

C. 2-3-4-1

D. 3-1-2-4

**Answer: B**



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**155.** Consider the following statements

Osmosis is a process of transport of water across a semipermeable membrane ,

1. Down the water potential gradient .
2. Up the water potential gradient .
3. Actively
4. Passively

Of these statements

- A. 1 and 3 are correct
- B. 2 and 3 are correct
- C. 2 and 4 are correct

D. 1 and 4 correct

**Answer: D**



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**156.** Which of the following molecules is capable of generating the greatest osmotic pressure ?

A. 300 mM glucose

B. 300 mM urea

C. 300 *mMNaCl*

D. 300 mM *CaCl<sub>2</sub>*

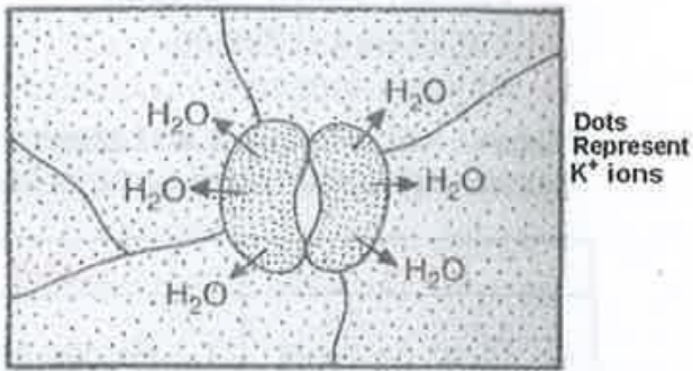
**Answer: D**



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**157.** The diagram illustrates stomatal closing .

The major mistake in the digram is



- A. The water should move inside the guard cells
- B. The peripheral walls of the guard cells should be thicker
- C. The concentration of the  $K^+$  should be equal on both inside the outside

D. The concentration of the  $K^+$  should be more outside the guard cells

**Answer: D**



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**158.** Pressure potential of a plant cell and its turgor pressure are

A. Numerically equal but first is in negative and second in positive value

B. Numerically equal and both positive

C. Numerically equal but first is positive  
and second negative

D. Both are numerically different and are  
negative

**Answer: B**



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**159.** In simple osmotic systems, at constant temperatures , the water potential results from the combined but opposite actions of

A. Relative humidity & pressure potential

B. Pressure potential and saturation

C. Saturation vapour pressure and osmotic potential

D. Osmotic potential and pressure potential

**Answer: D**



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**160.** Addition of KCN reduces the rate of water absorption in the root. This indicates the water absorption is a/an:

- A. Passive process
- B. Energy dependent process
- C. Osmotic difference dependent process
- D. Exchange diffusion process



**Answer: B**



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**161.** The carrier - mediated cotransport in which a solute is actively transported across a membrane against the gradient of electrochemical potential by coupling the uphill transport of one solute to the downhill transport of another in an example of

A. Symport transport

B. Primary active transport

C. Facilitated diffusion

D. Antiport transport

**Answer: D**



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**162.** Match List -I with List -II and select the correct answer using the codes given below

# the lists

List-I	List-II
A. Field capacity	1. Forces which hold water to the soil.
B. Permanent wilting	2. Combined effect of accelerated water loss and retarded water absorption.
C. Water deficit	3. Water content of a soil
D. Soil moisture tension	4. Loss of water from plant with little chance of regaining turgidity

A. *A B C D*  
3 4 2 1

B. *A B C D*  
1 2 3 4

C. *A B C D*  
2 4 3 1

D. *A B C D*  
3 1 2 4

**Answer: A**



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**163.** A minimum ratio of transpiration to photosynthesis will be observed on a

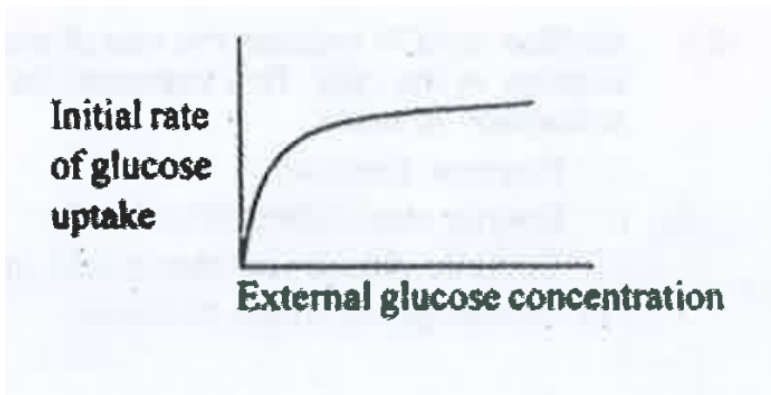
- A. Humid and cloudy day
- B. Humid and sunny day
- C. Sunny day with no winds
- D. Sunny day with strong winds

**Answer: B**



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**164.** The rate of glucose uptake in a cell , shown in the graph , indicated that the uptake is



A. An active transport

B. Via a transporter molecule

C. A passive diffusion

D. both (1) and (2)

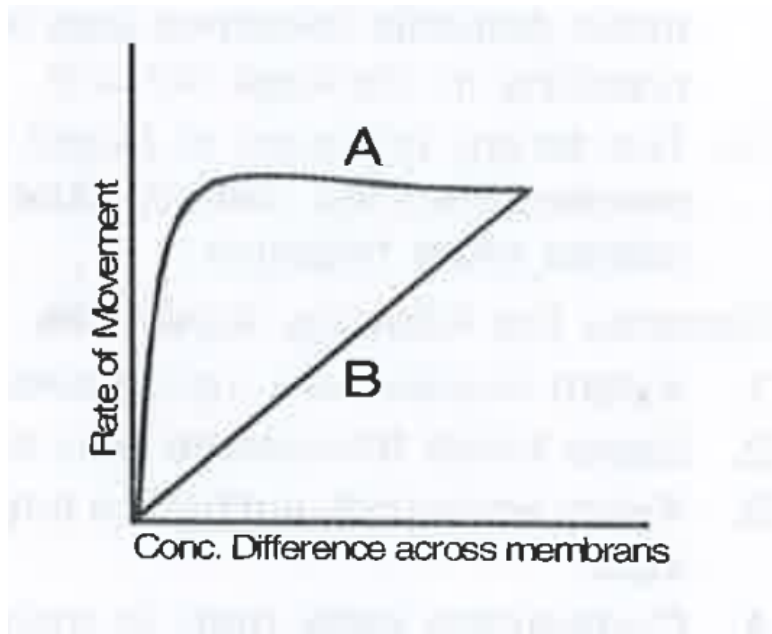
**Answer: D**



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**165.** The accompanying figure depicts movement of a solute across a membrane without consumption of energy . 'A' and 'B'

would be



A. Facilitated diffusion and passive diffusion

B. Passive diffusion and active transport

C. Passive diffusion and facilitated diffusion

## D. Facilitated diffusion and active transport

**Answer: A**



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**166.** LAR or leaf area ratio is the total area of leaves per total plant weight . It tends to be largest in

A. hydrophytes

B. Mesophytes



C. Xerophytes

D. halophytes

**Answer: A**



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**167.** A few properties of various transport systems of cells are given in the table below. Choose from the options to determine the type of transport systems that T1 and T2

represent

Property	T1	T2
Carrier mediated	+	+
Against the concentration gradient	-	+
Specificity	+	+
Energy expended	-	+
Solute modified during transport	-	-

A. T1: Passive diffusion

T2: facilitated

diffusion

B. T1: Passive diffusion

T2: Active

transport

C. T1: Active transport

T2: facilitated

diffusion

D. T1: facilitated diffusion

T2: Active

transport

**Answer: D**



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**168.** The osmotic pressure of 0.1 M glucose and 0.1 M sucrose solution are the same because

A. Both are carbohydrates

B. These are different compounds having different molecular weights

C. Both are present in the same concentration

D. Glucose is reducing sugar while sucrose is non-reducing sugar

**Answer: C**



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**169.** Addition of chemical fertilizers claims increased irrigation to avoid development of

A. excessive solute potential in soil

B. air spaces that may cause oxidation of  
fertilizers

C. bacteria that may decompose useful  
salts

D. larger root caps on the tender tips of  
branches of roots

**Answer: A**



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**170.** During the opening of stomata , the organic malate ions are produced in the guard cells for maintaining the

A. Negative voltage to take in potassium ions

B. Photosynthetic products in active osmotic form

C. Calcium ions in lesser concentration

D. Respiratory pathway in aerobic mode

**Answer: A**



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**171.** The translocation of organic solutes in sieve tube members is supported by

A. Mass flow involving a carrier and ATP

B. Cytoplasmic streaming

C. Root pressure and transpiration pull

D. P-proteins

**Answer: D**



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**172.** Sinks are related to

A. transport of materials

B. stomata

C. enzymes



D. phytochrome

**Answer: A**



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**173.** When the concentration of the soil solutes is low, the absorption of water

A. remains normal

B. is stopped

C. is increased

D. is decreased

**Answer: C**



**Watch Video Solution**

**174.** Guard cells help in

A. guttation

B. Fighting against infection

C. Protection against grazing

D. Transpiration

**Answer: D**



**Watch Video Solution**

**175.** The water potential increases due to

A. addition of solutes

B. pressure

C. guttation

D. condensation

**Answer: B**



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**176.** Translocation of sugars in flowering plants occurs in the form of

A. glucose

B. fructose

C. sucrose

D. lactose

**Answer: C**



177. Plasmolysis occurs when the cell is placed in

- A. isotonic solution
- B. hypotonic solution
- C. Hypertonic solution
- D. none of the above .

**Answer: C**



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

- A. Plasmodesmata
- B. Casparian strips of the endodermis
- C. Tracheids
- D. Vessel elements

**Answer: B**



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**179.** Transport of food material in higher plants takes place through

- A. Companion cells
- B. Transfusion tissue
- C. Tracheids
- D. Sieve elements

**Answer: D**



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**180.** The cause of the opening or closing of the stomata mainly depends on change in the turgidity of

- A. Microfibrils
- B. Guard cells
- C. Epidermal cells
- D. Xylem

**Answer: B**



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**181.** Function of companion cells is

- A. Providing energy to sieve elements for active transport
- B. Providing water to phloem
- C. Loading of sucrose into sieve elements by passive transport
- D. Loading of sucrose into sieve elements

**Answer: D**



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**182.** Guttation is the result of

- A. Diffusion
- B. transpiration
- C. Osmosis
- D. Root pressure

**Answer: D**



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**183.** When a cell is plasmolysed, it becomes

A. flaccid and its TP becomes 0

B. turgid and its TP becomes 0

C. turgid and TP becomes equal to OP

D. flaccid and DPD becomes 0

**Answer: A**



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**184.** Which one of the following is correctly matched ?

A. Apoplast-Plasmodesmata

B. Potassium - Readily immobilisation

C. Bakane of rice seedlings - F. Skoog

D. none of the above .

**Answer: D**



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**185.** Stomata open at night and close during the day time in

A. mesophytes

B. hydrophytes

C. succulents

D. shrubs

**Answer: C**



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**186.** Guttation takes place through

- A. cuticle
- B. stomata
- C. lenticels
- D. hydathodes

**Answer: D**



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**187.** Guttation differs from transpiration in

- A. It occurs in liquid form
- B. It occurs in vapour form
- C. It occurs during day time
- D. It is controlled by stomata

**Answer: A**



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

A. Transport saturation

B. Uphill transport

C. Requirement of special membrane proteins

D. High selectivity

**Answer: B**



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

- A. Ribosomes
- B. Mitochondria
- C. Vacuoles
- D. Plastids

**Answer: C**



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**190.** In a ring girdled plant :

- A. the root dies first
- B. the shoot and root die together
- C. neither root nor shoot will die
- D. the shoot dies first

**Answer: A**



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**191.** Transpiration and root pressure cause water to rise in plants by

- A. pulling and pushing it respectively
- B. pushing it upward
- C. pushing and pulling it, respectively
- D. pulling it upward

**Answer: A**



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**192.** Root pressure develops due to

- A. active absorption
- B. low osmotic potential in soil
- C. passive absorption
- D. increase in transpiration

**Answer: A**



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

- A. dissolved sugars in water
- B. tensile strength of water
- C. lignification of xylem vessels
- D. positive root pressure

**Answer: B**



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

B. The above processes happen only during night time.

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

D. Both processes cannot happen simultaneously

**Answer: A**



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**195.** A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap ?

A. Acidic

B. Alkaline

C. Low refractive index

D. Absence of sugar

**Answer: B**





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**196.** The water potential of pure water is

A. zero

B. less than zero

C. more than zero but less than one

D. more than one

**Answer: A**



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**197.** Which of the following facilitates opening of stomatal aperture ?

A. Concentration of outer wall of guard cells

B. Decreases in turgidity of guard cells

C. Radical orientation of cellulose microfibrils in the cell wall of guard cells

D. Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells

**Answer: C**



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