

**EXERCISE # 1**

**DIFFUSION, OSMOSIS & RELATED TERMS**

- Q.1** The physical process involved in the release of molecular oxygen from leaves is-  
(1) Diffusion                      (2) Transpiration                      (3) Osmosis                      (4) Capillarity
- Q.2** Who is called father of plant physiology :  
(1) K.V. Thimann                      (2) Stephan Hales                      (3) M. Calvin                      (4) E. Rabinowitch
- Q.3** Who is called father of Indian plant physiology ;  
(1) J.C. Bose                      (2) Calvin                      (3) R. Mishra                      (4) K.K. Nanda
- Q.4** One molar solution of which substance will have maximum O.P. :  
(1) NaCl                      (2) Glucose                      (3) Fructose                      (4) Starch
- Q.5** Pieces of beet root do not lose their colour in cold water, but do so in boiling water because:  
(1) The cell wall is killed in boiling water  
(2) Hot water can enter the cells readily  
(3) The plasma membrane gets killed in boiling water and becomes permeable  
(4) The pigment is not soluble in cold water
- Q.6** The movement of molecules from their higher concentration to lower concentration is called:  
(1) Osmosis                      (2) Diffusion                      (3) DPD                      (4) DPG
- Q.7** Osmosis is the diffusion of a solution of a weaker concentration when both are separated by semi-permeable membrane. What is error in the statement.  
(1) The movement of water molecule is not specified  
(2) There is no mention of DPD  
(3) Behavior of semipermeable membrane is not specified.  
(4) The exact concentration of solutions are not indicated.
- Q.8** What statement can be cited for 10% sodium chloride solution and 10% sugar solution present:  
(1) Both have equal OP  
(2) The conc. of sodium chloride solution will be less than conc. of sugar solution.  
(3) The OP of sugar solution will be higher than OP of sodium chloride solution.  
(4) DPD of sodium chloride solution will be higher than DPD of sugar solution.
- Q.9** If a plant cell is immersed in water, the water continues to enter the cell until the :  
(1) Concentration of the salts is the same inside the cell as outside  
(2) Cell bursts  
(3) Concentration of water is the same inside the cell as out side.  
(4) Diffusion pressure deficit is the same inside the cell as out side.
- Q.10** If a cell swells, after being placed in solution, the solution is-  
(1) Neutral                      (2) Hypotonic                      (3) Hypertonic                      (4) Isotonic

## Water Relations of Plants

- Q.11** Osmosis means :
- (1) Solute from low concentration to higher
  - (2) Solution from higher concentration to low
  - (3) Solvent from low concentration of solution to higher.
  - (4) Solvent from higher concentration to low.
- Q.12** If a cell is reduced in size (shrinks) of placing in a solution of sugar, the solution is :
- (1) Hypertonic
  - (2) Hypotonic
  - (3) Isotonic
  - (4) None of the above
- Q.13** The process of osmosis involves :
- (1) Movement of solute through a semipermeable membrane
  - (2) Movement of solvent through a semipermeable membrane
  - (3) Movement of solution through semipermeable membrane
  - (4) None of the above
- Q.14** A cell increases in volume if the external medium is-
- (1) Hypotonic
  - (2) Slightly hypertonic
  - (3) Isotonic
  - (4) Much more concentrated than the protoplasm of the cell
- Q.15** Osmosis involves diffusion of :
- (1) Suspended particles from higher to lower concentration.
  - (2) Suspended particles from lower to higher concentration.
  - (3) Water from more to less concentrated solution.
  - (4) Water from less to more concentrated solution.
- Q.16** A cell placed in a strong salt solution will shrink because-
- (1) The cytoplasm will be decomposed
  - (2) Mineral salts will break the cell wall
  - (3) Salt will enter the cell
  - (4) Water will leave the cell by exosmosis
- Q.17** Grapes placed in salt solution shrink due to :
- (1) Imbibition
  - (2) Endosmosis
  - (3) Plasmolysis
  - (4) Osmosis
- Q.18** Process of selective transmission of a liquid through semi permeable membrane is called-
- (1) Diffusion
  - (2) Osmosis
  - (3) Plasmolysis
  - (4) Transmission
- Q.19** Water enters into the root hair from the soil in its normal condition because the osmotic pressure of the soil solution :
- (1) Remains lesser than that of root hair sap
  - (2) Remains equal to that of root hair sap
  - (3) Remains higher than that of root hair sap
  - (4) And that of root hair sap remains zero.
- Q.20** Potato slices are immersed in a series of solution of different osmotic concentrations. No change in volume or weight is observed with slices in a 0.3 M solution. The osmotic concentration of vacuolar sap, therefore :
- (1) 0.3 M
  - (2) Greater than 0.3 M
  - (3) Less than 0.3 M
  - (4) Not related at all to the outside solution

## Water Relations of Plants

- Q.21** Which helps in maintaining form and structure of cells & soft parts of plants :
- (1) Osmotic pressure (2) Turgor pressure  
(3) Atmospheric pressure (4) DPD
- Q.22** Who propounded the concept of osmosis :
- (1) Abble Nollet (2) Dutrochet (3) Dixon and Joly (4) Renner
- Q.23** In terms of permeability, the cell wall and plasmalemma are :
- (1) Permeable and differentially permeable respectively  
(2) Both semipermeable  
(3) Semipermeable and permeable  
(4) Both differentially permeable
- Q.24** Plasma membrane controls :
- (1) Passage of water only  
(2) Passage of water and solutes in and out of the cell  
(3) Passage of water and solutes into the cell  
(4) Movement of cell contents out the cell
- Q.25** Which process occurs against a concentration gradient of solute :
- (1) Diffusion (2) Osmosis (3) Transpiration (4) Translocation
- Q.26** What shall be the sequence of events during wilting of a plant :
- (1) Exosmosis, deplasolysis, wilting (2) Endosmosis, plasmolysis, wilting  
(3) Exosmosis, plasmolysis, wilting (4) Exosmosis, endosmosis, wilting
- Q.27** When a plant cell is placed in a hypotonic solution, which of the following will not apply :
- (1) The wall pressure of the cell will fall  
(2) The cell will become turgid  
(3) The suction pressure of the cell sap will fall  
(4) The water potential of the cell sap will rise
- Q.28** When beet root slices are washed and then placed in cold water, anthocyanin does not come out, because plasma membrane is :
- (1) Differentially permable to anthocyanin (2) Dead structure  
(3) Impermeable to anthocyanin (4) Permeable to anthocyanin
- Q.29** Osmotic pressure is highest in :
- (1) Xerophytes (2) Lithophytes (3) Halophytes (4) Mesophytes
- Q.30** If osmotic potential of a cell is – 10 bars and its pressure potential is 5 bars, its water potential would be-
- (1) – 5 bars (2) 5 bars (3) – 10 bars (4) 10 bars
- Q.31** Plasma membrane is-
- (1) Permeable (2) Impermeable (3) Semipermeable (4) Selectively permeable

## Water Relations of Plants

- Q.32** A cell kept in a solution draws water & swell up, the nature of this solution is-  
(1) Isotonic                      (2) Hypertonic                      (3) Hypotonic                      (4) Any
- Q.33** Osmosis means :  
(1) Movement of molecules from higher concentration to lower concentration  
(2) Uptake of water by roots  
(3) Passage of solvent from a weaker solution to stronger solution across a semipermeable membrane.  
(4) Passage of solvent from a weaker to a stronger solution separated by a membrane.
- Q.34** In which plant osmotic pressure is high in cells :  
(1) *Atriplex*                      (2) *Dendrobium*                      (3) *Mangifera*                      (4) *Agave*
- Q.35** The osmotic pressure of distilled water will be-entrat  
(1) Minimum                      (2) Maximum                      (3) Higher than any solution (4) Variable
- Q.36** Tonoplast is :  
(1) Permeable membrane                      (2) Semi permeable membrane  
(3) Impermeable membrane                      (4) Selectively permeable membrane
- Q.37** Abbe Nollet name is concerned with -  
(1) Plasmolysis                      (2) DPD                      (3) Osmosis                      (4) Water potential
- Q.38** If in a cell suction pressure value is 30 unit while osmotic pressure 42 unit; then calculate the turgidity developed in form of TP in the cell :  
(1) 12 units                      (2) 72 units                      (3) - 12 units                      (4) 1.4 unit
- Q.39** If the molar concentration of the given sugar solution is 0.3 M, find out the osmotic pressure of this solution-  
(1) 6.72 atm                      (2) 67.2 atm                      (3) 2.24 atm                      (4) 5.60 atm
- Q.40** Osmosis is the phenomenon expressed by :  
(1) Solute present in the solution                      (2) Water molecules  
(3) Semi permeable membrane                      (4) O<sub>2</sub>
- Q.41** The osmotic pressure of the cell is measured by-  
(1) Plasmolysis method                      (2) Osmometer  
(3) Molar concentration of the cell sap                      (4) Deplasmolysis
- Q.42** When grapes are placed in water, then which process occurs :  
(1) Plasmolysis                      (2) Exosmosis                      (3) Endosmosis                      (4) None of the above
- Q.43** Maximum osmotic pressure is found in-  
(1) Root hair                      (2) Cortex cell of the root  
(3) Passage cell of the root                      (4) Mesophyll cell
- Q.44** Plasma membrane & Tonoplast shows :  
(1) Permeability                      (2) Semi permeability  
(3) Semi permeability & permeability                      (4) Selectively permeability

## Water Relations of Plants

- Q.45** The condition when the cell will burst is :  
(1)  $SP > OP$                       (2)  $TP < WP$                       (3)  $TP > WP$                       (4)  $TP = OP$
- Q.46** The osmotic pressure is due to -  
(1) Solute                                      (2) Semi permeable membrane  
(3) Hypertonic solution                      (4) Water
- Q.47** In which plants high osmotic pressure is found in the cells :  
(1) Epiphytes                      (2) Psychrophytes                      (3) Mangroves                      (4) Psammophytes
- Q.48** Osmotic pressure is the property of :  
(1) Water molecules                      (2) Solute particles  
(3) Semi permeable membrane                      (4) Solution

### DPD (SP)

- Q.49** When a cell is fully turgid which of the following will be zero :  
(1) Turgor pressure      (2) Wall pressure      (3) Suction pressure      (4) Osmotic pressure
- Q.50** Water from the soil enters in to the root hairs on account of-  
(1) Turgor pressure                      (2) Suction pressure or DPD  
(3) Barometric pressure                      (4) Osmotic pressure
- Q.51** In a fully turgid cell the values of DPD, OP and TP should be :  
(1)  $DPD = 10 \text{ atm.}$   $OP = 15 \text{ atm.}$ ,  $TP = 5 \text{ atm.}$   
(2)  $DPD = 5 \text{ atm.}$ ,  $OP = 12 \text{ atm.}$ ,  $TP = 7 \text{ atm.}$   
(3)  $DPD = 2 \text{ atm.}$ ,  $OP = 7 \text{ atm.}$ ,  $TP = 5 \text{ atm.}$   
(4)  $DPD = 0 \text{ atm.}$ ,  $OP = 15 \text{ atm.}$ ,  $TP = 15 \text{ atm.}$
- Q.52** When the cell is placed in water, it takes water this is due to :  
(1) Osmotic pressure                      (2) Suction pressure  
(3) Diffusion                      (4) Water potential and TP
- Q.53** The relationship between SP & OP in a plasmoyesed cell can be represented as :  
(1)  $SP = OP$                       (2)  $SP > OP$                       (3)  $SP < OP$                       (4)  $SP - OP = 0$
- Q.54** What is the direction of the movement of water if two cells have the same OP but differ in TP:  
(1) No net flow                      (2) From lower T.P. to higher TP  
(3) From higher TP to lower TP                      (4) Data insufficient
- Q.55** The hydrostatic pressure developed in the cell is called :  
(1) Turgor pressure      (2) Wall pressure      (3) Osmotic pressure      (4) Suction pressure
- Q.56** In fully turgid cell :  
(1)  $DPD = WP$                       (2)  $DPD = OP$                       (3)  $DPD = OP - TP$                       (4)  $DPD = 0$
- Q.57** In fully flaccid cell :  
(1)  $DPD = WP$                       (2)  $DPD = OP$                       (3)  $DPD = 0$                       (4)  $DPD = OP - TP$

## Water Relations of Plants

- Q.58** Osmotic pressure is lowest in :  
(1) Halophytes                      (2) Mesophytes                      (3) Hydrophytes                      (4) Epiphytes
- Q.59** Turgor pressure of a plasmolysed cell is-  
(1) Positive                      (2) Zero                      (3) Negative                      (4) None of these
- Q.60** Which of the following osmotic quantities have the same magnitude :  
(1) OP & TP                      (2) OP & DPD                      (3) TP & WP                      (4) WP & OP
- Q.61** When water enters into a cell what happens to its OP, TP and DPD :  
(1) OP & TP increase & its DPD increase                      (2) OP & DPD increase & TP decrease  
(3) TP & DPD decrease & OP increase                      (4) OP & DPD decrease & TP increase
- Q.62** DPD stands for :  
(1) Diffusion pressure deficit                      (2) Diffusion pressure demand  
(3) Daily photosynthetic depression                      (4) Daily phosphorous demand
- Q.63** What is the value of DPD of a cell :  
(1)  $DPD = OP \times TP$                       (2)  $DPD = OP + TP$   
(3)  $DPD = OP - TP$                       (4)  $DPD = OP/TP$
- Q.64** Under natural conditions the osmotic pressure is -  
(1) More than turgor pressure                      (2) Less than turgor pressure  
(3) Equal to turgor pressure                      (4) Zero
- Q.65** What is the direction of the net movement of water between two cell X and Y if the DPD of X is lower than Y :  
(1) X to Y                      (2) Y to X                      (3) Out of X                      (4) No net movement
- Q.66** What maintains the shape of a cell :  
(1) Osmotic pressure                      (2) Turgor pressure  
(3) Suction pressure                      (4) Hall pressure
- Q.67** Osmotic potential is numerically equal to -  
(1) Turgor pressure                      (2) Wall pressure  
(3) Osmotic pressure                      (4) DPD
- Q.68** You are given three cells, a root hair, a cell of the inner cortical layer and a cell of the mesophyll arrange them in ascending order of DPD :  
(1) Root hair < Cortical cell mesophyll                      (2) Cortical cell < mesophyll < Root hair  
(3) Mesophyll < Root hair < Cortical cell                      (4) Root hair < Mesophyll < Cortical cell
- Q.69** If a plant cell is immersed in water the water continue to enter in to the cell until :  
(1) The conc. of salt become equalised                      (2) The DPD becomes equalised  
(3) The conc. of salt become equalised                      (4) Cell bursts
- Q.70** Osmotic pressure is highest in :  
(1) *Atriplex confertifolia*                      (2) *Salsola foetida*  
(3) *Rhizophora*                      (4) *Chenopodium*

## Water Relations of Plants

**Q.71** The direction of the movement of water :

- (1) From low OP to high OP (2) From low DPD to high DPD  
(3) From high DP to low DP (4) All of the above

**Q.72** The term "DPD" was coined by-

- (1) Renner (2) Kramer (3) B.S. Mayer (4) Stephen Hales

**Q.73** The entry of water from the soil up to xylem elements of root is due to-

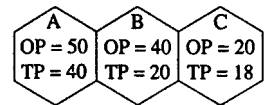
- (1) Gradient of suction pressure (2) Turgor pressure  
(3) Degree of imbibition (4) Concentration of ions in water

**Q.74** If A solution is hypotonic while B is hypertonic; the right statement will be-

- (1) A solution is having more DPD than the B  
(2) A solution is having less  $\psi_w$  than the B  
(3) A solution is having more concentration than the B  
(4) A solution is having less DPD & more  $\psi_w$  than the B

**Q.75** The three cells A, B & C are joined in a linear manner. Demonstrate the movement of water & direction in these :

- (1) A → B → C (2) A ← B ← C  
(3) A → B ← C (4) A ← B → C



**Q.76** If the DPD the cell sap is 25 unit, when it is placed in solution having 10 unit DPD. The phenomenon expressed will be-

- (1) Plasmolysis (2) Endosmosis (3) Exosmosis (4) All

**Q.77** When the solute has been added in the solution, then following observation can be made:

- (1) The DPD of the solution decreases  
(2) The  $\psi_w$  of the solution increases  
(3) DPD of the solution decreases while its  $\psi_w$  increases  
(4) DPD of the solution increases while its  $\psi_w$  decreases

**Q.78** If the given solution is of 25% concentration; then what cannot be presented for this-

- (1) OP (2) DPD (3) Solute potential (4) TP & SP

**Q.79** In a fully turgid cell, what relationship has been expressed :

- (1) SP > OP (2) SP = OP (3) TP = OP (4) TP = WP

**Q.80** In a system if DPD of A cell is 5 bars while OP & TP of B, C, D cells are 10, 20, 30 & 4, 14, 24 bars. what will be direction for flow of water in these cells :

- (1) A to B, C, D cells (2) B, C, D to A cell  
(3) A, B, C to D cell (4) A, B, D to C cell

**Q.81** Water passes in to a cell due to-

- (1) Osmotic pressure (2) DPD (3) Wall pressure (4) Diffusion

## Water Relations of Plants

- Q.82** If a cell is placed in any hypotonic solution; it shows :  
(1) Exosmosis (2) Plasmolysis  
(3) Endosmosis (4) Increase in DPD of the cell
- Q.83** In a flaccid cell which condition does not occur-  
(1)  $TP = 0$  (2)  $SP = 0$  (3)  $WP = 0$  (4)  $SP = OP$
- Q.84** Osmotic pressure of a cell is zero when :  
(1) T.P. is maximum (2) DPD is maximum (3) T.P. is zero (4) Not possible
- Q.85** The accurate relationship between SP, OP, TP can be expressed as-  
(1)  $SP = OP + TP$  (2)  $OP = SP - TP$  (3)  $TP = SP - OP$  (4)  $SP = OP - TP$
- Q.86** The concept of DPD was propounded by-  
(1) Dixon (2) Kramer (3) Meyer (4) Priestley
- Q.87** Root hair drawing water from soil by-  
(1) Osmosis (2) SP (3) TP (4) WP
- Q.88** In which condition the turgor pressure of the cell becomes equal to the osmotic pressure-  
(1) In Flaccid cell (2) In plasmolysed cell  
(3) In fully turgid cell (4) It never happens
- Q.89** The maximum value of DPD of a cell is equal to-  
(1) OP (2) WP (3) TP (4) None of these
- Q.90** Search the right statement-  
(1) Water has minimum  $\psi_w$  (2) Water has maximum  $\psi_w$   
(3) Water has maximum DPD (4) Water has variable  $\psi_w * DPD$
- Q.91** The best condition by which fully turgid cell can be identified is :  
(1) TP is minimum (2) SP is maximum (3) OP less than SP (4)  $TP = OP$
- Q.92** The condition applicable for flaccid cell only is :  
(1)  $SP = 0$  (2)  $TP = WP$  (3) TP maximum (4)  $TP = 0$
- Q.93** Cell membrane is-  
(1) Permeable (2) Semipermeable (3) Impermeable (4) Plasmodesmata
- Q.94** Selective permeability identifies phenomenon of-  
(1) Diffusion (2) Osmosis (3) Imbibition (4) Plasmolysis
- Q.95** Plasmolysis can be used for-  
(1) Good growth of plants (2) Good growth of weeds  
(3) Killing the weeds (4) None of the above

## Water Relations of Plants

- Q.96** Along with plasmolysis which decreases in the cell :
- (1) Osmotic pressure (2) Diffusion pressure  
(3) Imbibition pressure (4) Turgor pressure
- Q.97** If a plasmolysed cell is placed in distilled water then it returns to its original state & become turgid, this is called as :
- (1) Plasmolysis (2) Exosmosis (3) Endosmosis (4) Deplamolysis
- Q.98** If there in high amount of manure present in soil & it is deficient in water then what will be the effect-
- (1) Over growth (2) Under growth (3) No effect (4) Wilting of plants
- Q.99** Plant cells do not burst in distilled water because-
- (1) Cell wall is permeable (2) Cell wall is living  
(3) Cell wall is elastic, rigid and get stretched (4) Cell wall is dead and impermeable
- Q.100** When a plant cell is placed in a hypertonic solution it becomes plasmolysed what shall be present between cell wall and plasmalemma at this stage-
- (1) Water and air (2) Cell sap (3) Hypertonic solution (4) Solutes
- Q.101** Bacteria can not survive in a highly salted pickle because-
- (1) Salt inhibits reproduction of bacteria  
(2) Enough light is unavailable for photosynthesis  
(3) They become plasmolysed and death occurs  
(4) Nutrients in the pickle medium can not support life.
- Q.102** Plasmolysis occurs due to-
- (1) Exosmosis (2) Endosmosis  
(3) Presence of solutes (4) Semipermeability of cell membrane
- Q.103** In a plasmolysed cell there is gap between cell wall & plasma membrane; this gap shows presence of-
- (1) Air (2) Water  
(3) Hypertonic solution (4) Hypotonic solution
- Q.104** In cold water, the cabbage leaves do not lose colour, but on boiling they lose colour in water, why ?
- (1) Cell wall is damaged (2) Cell membrane is damaged  
(3) Cell well becomes permeable (4) None of the above
- Q.105** Cell becomes plasmolysed due to-
- (1) Osmosis (2) DPD (3) Endosmosis (4) Exosmosis
- Q.106** The right relationship in a plasmolysed cell is presented as :
- (1)  $SP = OP$  (2)  $OP = SP + TP$  (3)  $SP > OP$  (4)  $SP < OP$
- Q.107** A cell placed in the solution gets plasmolysed. The nature of the solution will be-
- (1) Hypotonic (2) Isotonic (3) Concentrated (4) Hypertonic

## Water Relations of Plants

**Q.108** Plasmolysis occurs when the cell is placed in-

- (1) Hypertonic solution
- (2) Water
- (3) Hypotonic solution
- (4) Isotonic solution

## WATER POTENTIAL

**Q.109** Value of water potential for pure water is-

- (1) 1
- (2) 2
- (3) 3
- (4) Zero

**Q.110** Water potential is affected by :

- (1) Osmotic potential
- (2) Matric potential
- (3) Pressure potential
- (4) All of the above

**Q.111** When the solute has been added to the solution; its water potential will :

- (1) Increases
- (2) Decreases
- (3) Remain unchanged
- (4) First increases then decreases

**Q.112** Water potential of a cell when its placed in hypertonic solution :

- (1) Decreases
- (2) Increases
- (3) First increases then decreases
- (4) No change

**Q.113** Osmotic potential ( $\psi_s$ ) of a solution is always :

- (1) Positive
- (2) Negative
- (3) Zero
- (4) Variable

**Q.114** Water potential ( $\psi$ ) of a solution is always :

- (1) + ve
- (2) - ve
- (3) Zero
- (4) Variable

**Q.115** When the water potential of a cell become zero, it is said to be in -

- (1) Turgid state
- (2) Flaccid state
- (3) Incipiently plasmolysed state
- (4) Completely plasmolysed state

**Q.116** A root hair cell under ordinary conditions have a water potential in the range of :

- (1) - 1 to - 4 atmospheres
- (2) - 1 to + 4 atmospheres
- (3) 1 to 2 atmospheres
- (4) - 1 to 2 atmospheres

**Q.117** Which equation correctly depicts water potential :

- (1)  $\psi_w = \psi_s + \psi_p$
- (2)  $\psi_w = \psi_s + \psi_p + T.P.$
- (3)  $\psi_w = \psi_s - \psi_p$
- (4) None of these

**Q.118** Why hygroscopic water is not available to plants -

- (1) Because its  $\psi$  greatly increased
- (2) Because its DPD is greatly decreased
- (3) Because its  $\psi$  becomes strongly negative
- (4) Because its  $\psi$  is increased and DPD is decreased

**Q.119** When the water potential of a cell becomes zero, it is said to be in :

- (1) Flaccid state
- (2) Fully turgid state
- (3) Plasmolysed state
- (4) Incipiently plasmolysed state

## Water Relations of Plants

**Q.120** The concept of water potential was propounded by-

- (1) Robert Mayer      (2) Abbe Nollet      (3) Slatyer & Taylor      (4) Levitt

**Q.121** The solute potential can be determined in a simple manner by-

- (1) Water potential      (2) DPD  
(3) Osmotic pressure      (4) Suction pressure

**Q.122** The accurate equation for presenting water potential is :

- (1)  $\psi_w = \psi_s + \psi_p + \psi_m$       (2)  $\psi_s = \psi_w + \psi_p + \psi_m$   
(3)  $\psi_w = \psi_s - \psi_p - \psi_m$       (4)  $\psi_w = -\psi_s - \psi_p - \psi_m$

**Q.123** If a cell is placed in a hypertonic solution then water potential of the cell will be-

- (1) Increased      (2) Decreased  
(3) Unchanged      (4) First increases then decreases

**Q.124** The direction of the water flow in given cells X, Y & Z can be presented as :

- (1)  $X \rightarrow Y \leftarrow Z$       (2)  $X \rightarrow Y \rightarrow Z$       (3)  $X \leftarrow Y \leftarrow Z$       (4)  $X \leftarrow Y \rightarrow Z$

**Q.125** The water potential & osmotic potential of pure water is :

- (1) 100 & zero      (2) zero & zero      (3) 100 & 200      (4) zero & 100

**Q.126** The relationship between DPD &  $\psi_s$  can be expressed as-

- (1)  $DPD = \psi_w$       (2)  $\psi_w - DPD = 0$       (3)  $\frac{DPD}{\psi_w} = 0$       (4)  $\psi_w = -DPD$

**Q.127** Solute potential can be presented as-

- (1)  $\psi_s = -OP$       (2)  $\psi_w = OP$       (3)  $OP - \psi_s = 0$       (4)  $\frac{\psi_s}{OP} = 0$

**Q.128** In plant water relations,  $\psi$  indicates-

- (1) DPD      (2) Solute potential      (3) Water potential      (4) Suction pressure

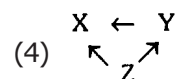
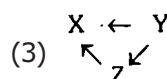
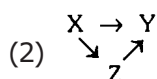
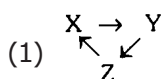
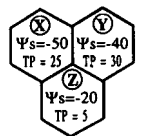
**Q.129** Solute potential is numerically equal to-

- (1) TP      (2) WP      (3) OP      (4) DPD

**Q.130** If the solute is added in the given solution than what observation can be made :

- (1) Its DPD decreased  
(2) Its water potential decreases  
(3) DPD & water potential remains unchanged  
(4) Its water potential increases

**Q.131** If three cells X, Y and Z are joined to each other & their solute potential & Turgor pressure values are given in the figure; then demonstrate the direction of flow of water in this system-



## Water Relations of Plants

- Q.132** In 0.1 M solution of a non electrolyte,  $\psi_w$  value will be-  
(1) Zero bar                      (2) + 2.3 bar                      (3) - 2.3 bar                      (4) - 22.4 bar
- Q.133** If a cell is placed in a hypertonic solution then  $\psi_w$  of the cell will be-  
(1) Increased                      (2) Decreased  
(3) Unchanged                      (4) First increases then decreases
- Q.134** The water potential of pure water is zero. What happens when it is converted into a solution of 0.1M concentration-  
(1) Its water potential remains unchanged  
(2) Its water potential is decreased by 0.1%  
(3) Its water potential is increased by 2.3 bars  
(4) Its water potential is decreased by 2.3 bars
- Q.135** The  $\psi_w$  of pure water is-  
(1) Minimum                      (2) Equal to DPD                      (3) Maximum                      (4) Variable
- Q.136** If the OP of any osmotic system is 35 atm and its turgor pressure 9 units. Find out water potential present in the osmotic system :  
(1) - 44 unit                      (2) - 26 unit                      (3) 26 unit                      (4) - 3.88 unit
- Q.137** Solute potential is :  
(1) = - DPD                      (2) = TP                      (3) = - OP                      (4) = DPD - TP
- Q.138** The water potential term was given by-  
(1) Steward & Taylor                      (2) Taylor & Atkins  
(3) Slatyer & Taylor                      (4) Slayer & Tailor

## IMBIBITION

- Q.139** Seeds swell when placed in water due to-  
(1) Osmosis                      (2) Imbibition                      (3) Hydrolysis                      (4) All of these
- Q.140** During rainy season wooden doors generally swell up due to-  
(1) Osmosis                      (2) Imbibition                      (3) Bad workmanship                      (4) Wood quality
- Q.141** Imbibition process involves :  
(1) Both diffusion and capillary action                      (2) Only diffusion  
(3) Only capillary action                      (4) None of these
- Q.142** The most powerful imbibant is-  
(1) Agar-agar                      (2) Proteins                      (3) Cellulose                      (4) Lignin
- Q.143** The least powerful imbibant is-  
(1) Agar-agar                      (2) Protein                      (3) Cellulose                      (4) Pectin
- Q.144** Swelling of wooden planks and door-panels during the rainy season is due to-  
(1) Imbibition                      (2) Endosmosis                      (3) Deplasmolysis                      (4) Diffusion

## Water Relations of Plants

- Q.145** First step in the flux of water into a plant (or) a root hair cell (or) a seed is-  
(1) Osmosis                      (2) Imbibition                      (3) Absorption                      (4) Suction
- Q.146** Which of the following is imbibiant-  
(1) Proteins                      (2) Pectin                      (3) Starch                      (4) All of the above
- Q.147** Which of the following seeds develop a greater imbibition pressure-  
(1) Wheat seed                      (2) Gram seed                      (3) Rice seed                      (4) Mustard oil seed
- Q.148** Swelling in wooden block placed in water is due to-  
(1) Endosmosis                      (2) Capillarity                      (3) Absorption                      (4) Imbibition
- Q.149** The right sequence for imbibition is :  
(1) Agar agar > cellulose > protein                      (2) Protein > cellulose > agar agar  
(3) Agar agar > protein > cellulose                      (4) Agar agar < protein > cellulose
- Q.150** To initiate cell plasmolysis, the salt concentration must be-  
(1) Isotonic                      (2) Hypotonic                      (3) Hypertonic                      (4) Atonic
- Q.151** When a plasmolysed cell is placed in a hypotonic solution then water will move inside the cell this will happen due to which force-  
(1) DPD                      (2) OP                      (3) W.P.                      (4) None of these

### EXERCISE # 2

#### WATER ABSORPTION

- Q.1** Which of the following statement is not correct :
- (1) Plants absorb excess quantity of water
  - (2) Plants take small quantity of mineral salts through soil water
  - (3) Water and inorganic salts are taken in simultaneously by root hair
  - (4) Plant absorb only one thing at a time water or inorganic salts
- Q.2** Which of the following is a rapid type of absorption :
- (1) Passive absorption
  - (2) Active absorption
  - (3) Salt absorption
  - (4) Root absorption
- Q.3** The form of water absorbed by plant's root system, from the soil is-
- (1) Hygroscopic water
  - (2) Gravitational water
  - (3) Capillary water
  - (4) All of these
- Q.4** A fertile soil is likely to have pH of-
- (1) 1
  - (2) 8
  - (3) 6 to 7
  - (4) 11 to 12
- Q.5** The path way of water from soil upto the secondary xylem :
- (1) Soil → root hair → cortex → endodermis → pericycle → protoxylem → meta xylem
  - (2) Metaxylem → protoxylem → pericycle → cortex → endodermis → soil → root hair
  - (3) Cortex → root hair → endodermis → pericycle → protoxylem → metaxylem
  - (4) Pericycle → soil → root hair → cortex → endodermis → protoxylem → metaxylem
- Q.6** Humus in soil is necessary for plant growth because it-
- (1) Increases aeration and water absorption capacity of soil
  - (2) Makes soil compact
  - (3) Makes soil sterile
  - (4) Decreases rate of percolation
- Q.7** Water will be absorbed by root hairs when :
- (1) Concentration of salts in the soil in high
  - (2) Concentration of solutes in the cell sap is high
  - (3) The plant is rapidly respiring
  - (4) They are separated from the soil by a semipermeable membrane
- Q.8** Field capacity is the extent to which a soil can hold :
- (1) Gravitational water
  - (2) Capillary water
  - (3) Hygroscopic water
  - (4) Capillary plus hygroscopic water
- Q.9** Water in plants is transported by ascent of sap which takes place through :
- (1) Cambium
  - (2) Phloem
  - (3) Xylem
  - (4) Epidermis

## Water Relations of Plants

- Q.10** In poorly aerated soil, the rate of water absorption will :  
(1) Increase                      (2) Decrease                      (3) Remains the same (4) None of these
- Q.11** Which of the following water comes under echards :  
(1) Available to the plant  
(2) Whole of the soil water  
(3) Amount of water not available to the plant  
(4) None of the above
- Q.12** Which plant hormone help in active absorption of water :  
(1) Auxin                      (2) GA                      (3) Cytokinin                      (4) ABA
- Q.13** What is true for the water available in the soil-  
(1) Holard = Chresard + Echard                      (2) Holard = Chresard - Echard  
(3) Chresard = Holard + Echard                      (4) Echard = Holard + Chresard
- Q.14** Passive absorption of water takes place by :  
(1) Osmosis                      (2) The presence of energy  
(3) Root pressure                      (4) Transpiration pull
- Q.15** Root hairs occurs in-  
(1) Meristematic zone                      (2) Cell elongation zone  
(3) Cell maturation zone                      (4) Old root
- Q.16** All the following involves osmosis except :  
(1) Movement of water from soil to root  
(2) Movement of water from root hair to endodermis and pericycle  
(3) Movement of water between xylem elements  
(4) Movement of water from xylem to mesophyll cells of the leaves
- Q.17** Suitable temperature for active absorption of water by root is-  
(1) 40-50°C                      (2) 10-15°C  
(3) 20-35°C                      (4) Can take at any temperature
- Q.18** "Osmotic theory" for an active absorption of water was given by :  
(1) Thimann                      (2) O. Hertwig                      (3) Atkins & Priestley                      (4) J.C. Bose
- Q.19** Root cap plays no role in the absorption of water by a plant because :  
(1) Its cells are loosely arranged                      (2) It has not root hairs  
(3) It has no connection with xylem tissue                      (4) It cells are dead
- Q.20** Energy dependent absorption of water against osmotic phenomenon is :  
(1) Active absorption                      (2) Passive absorption  
(3) Imbibition                      (4) Bulk absorption
- Q.21** In a young root the most active absorption of water takes place through :  
(1) Root cap region                      (2) Root hair region  
(3) Zone of elongation                      (4) Mature region with a corky layer

## Water Relations of Plants

- Q.22** Water is actively absorbed by root when :
- (1) Soil solution is hypotonic
  - (2) Soil solution is hypertonic
  - (3) Transpiration rates are high
  - (4) Shoot pressure is high
- Q.23** Maximum absorption of water by a root occur in the region of :
- (1) Cell division
  - (2) Cell elongation
  - (3) Cell maturation
  - (4) Cell division and root cap together
- Q.24** Absorption of water by a root is most rapid :
- (1) When the absorption is passive
  - (2) When the absorption is active
  - (3) When the loss of water by guttation is rapid
  - (4) When the secretion of salt and water is rapid
- Q.25** Absorption of water by root is increased when :
- (1) Transpiration is increased
  - (2) Photosynthesis is increased
  - (3) Respiration is increased
  - (4) Root pressure is increased
- Q.26** Passive absorption of water from the soil by the root is mainly affected by-
- (1) Typical tissue organisation
  - (2) Respiratory activity of root
  - (3) Tension on cell sap due to transpiration
  - (4) None of these
- Q.27** Active absorption of water from the soil by the root is mainly affected by-
- (1) Typical tissue organisation
  - (2) Respiratory activity of root
  - (3) Tension on cell sap due to transpiration
  - (4) None of these
- Q.28** The water held tightly by the soil particles around them is known as :
- (1) Field capacity
  - (2) Run away water
  - (3) Hygroscopic water
  - (4) Capillary water
- Q.29** Percentage of water left in the soil when a plant begins to wilt is known as :
- (1) Wilting coefficient
  - (2) pH value of soil
  - (3) Field capacity
  - (4) Water holding capacity
- Q.30** What is "action - spectrum" of passive absorption of water :
- (1) Red
  - (2) Far red
  - (3) Blue & red
  - (4) Blue & far red
- Q.31** Active absorption of water by root is increased when :
- (1) Transpiration is increased
  - (2) Photosynthesis is increased
  - (3) Respiration is increased
  - (4) Root pressure is increased
- Q.32** Which of the following factors inhibit the absorption of water by roots-
- (1) Low soil temperature
  - (2) High concentration of soil solution
  - (3) Low soil aeration
  - (4) All of the above
- Q.33** Which of the plants can absorb water in the form of vapour from its atmosphere-
- (1) All xerophytes
  - (2) Low transpiring cacti
  - (3) Succulents plants
  - (4) Epiphytes & Lichen

## Water Relations of Plants

- Q.34** "Non-osmotic" theory for an active absorption of water was given by-  
(1) Thimann & Bennetclark (2) Atkin & Priestley  
(3) J.C. Bose (4) O. Hertig
- Q.35** When the temperature of soil becomes 1°C then-  
(1) Absorption of water increases  
(2) Active absorption of water decreases  
(3) Passive absorption of water remains unaffected  
(4) Both (2) and (3) are correct
- Q.36** When the concentration of the soil solutes is low, the absorption of water is-  
(1) Retarded (2) Increase (3) Remain normal (4) Stopped
- Q.37** Plant roots absorb-  
(1) Water only (2) Minerals only  
(3) Water or solute, one at a time (4) Water & solute together
- Q.38** Which of the following tissue is used in the conduction of water in plants :  
(1) Cambium (2) Sieve tubes (3) Tracheids & Trachea (4) Phloem
- Q.39** Which type of plant are physiologically dry :  
(1) Hydrophytes (2) Epiphytes (3) Lithophytes (4) Halophytes
- Q.40** Which method is responsible for most of the absorption in higher plants :  
(1) Active absorption (2) Passive absorption  
(3) Osmotic absorption (4) Non osmotic absorption
- Q.41** During absorption, the water available to plants will be-  
(1) Capillary water (2) Echarde  
(3) Hygroscopic water (4) Holard
- Q.42** the absorption of water due to expenditure of energy is called-  
(1) Non osmotic active absorption (2) Osmotic active absorption  
(3) Passive absorption (4) All
- Q.43** Halophytes grow on physiologically dry soil due to-  
(1) Dry soil (2) Excessive humidity outside  
(3) Excessive salts in plants (4) Excessive salts in water

## ASCENT OF SAP

- Q.44** In the tree having hollow trunk, the part first die will be-  
(1) Root (2) Stem (3) Leaf (4) None
- Q.45** Water rises in the stem due to -  
(1) Cohesion and transpiration pull (2) Turgor pressure  
(3) Osmotic pressure (4) None of these

## Water Relations of Plants

- Q.46** Sap ascends in woody stem because of-  
(1) Transpiration pull (2) Capillarity (3) Molecule adhesion (4) Photosynthesis
- Q.47** Pulsation theory to explain ascent of sap was proposed by-  
(1) Dixon and Joly (2) Curtis (3) J.C. Bose (4) None of these
- Q.48** Which of the following contributes most to transport of water from the ground to the leaves of a tall tree-  
(1) Break down of ATP (2) Root pressure  
(3) Capillary rise of water in xylem (4) Cohesion and transpiration pull
- Q.49** Dixon and Joly are associated with-  
(1) Light reaction and photosynthesis  
(2) An aerobic respiration  
(3) Cohesion and transpiration pull theory of ascent of sap  
(4) Apical dominance
- Q.50** The continuity of water column in xylem is maintained due to-  
(1) Presence of air bubbles (2) Cohesive property of water  
(3) Evaporation power of water (4) None of these
- Q.51** Relay pump theory of ascent of sap was proposed by :  
(1) Bose (2) Godlewsky (3) Westermaier (4) Von sachs
- Q.52** The first vital theory to explain ascent of sap was proposed by-  
(1) J.C. Bose (2) Godlwski (3) Westermaier (4) Dixon and Joly
- Q.53** Capillary theory to explain ascent of sap was proposed by-  
(1) Boehm (2) Sachs (3) Jamin (4) Priestlay
- Q.54** Ringing experiment to explain ascent of sap path was firstly done by-  
(1) Hartig, Malpighi (2) Dixon & Joly  
(3) Godlewski & J.C. Bose (4) Stephen Hales and Boehm
- Q.55** Passage of ascent of sap is shown by-  
(1) Osmometer (2) Porometer (3) Manometer (4) Ringing experiment
- Q.56** Transpiration - cohesion - tension theory operates in-  
(1) Active absorption (2) Passive absorption  
(3) Active & passive absorption (4) None of these
- Q.57** Attractive forces of cell walls for water molecules is termed as :  
(1) Adhesion (2) Cohesion (3) Osmosis (4) Plasmolysis
- Q.58** The imbibition theory for the ascent of sap was suggested by-  
(1) Sir J.C. Bose (2) Strasburger (3) Sachs (4) Dixon and Joly

## Water Relations of Plants

- Q.59** If all the tissues of a plant to certain points are removed except the xylem which is left intact:
- (1) The leaves will wilt
  - (2) The stem will die first
  - (3) The roots will die first
  - (4) The whole plant will die at the same time
- Q.60** Plant always take their food in-
- (1) Inorganic form
  - (2) Soluble form
  - (3) Organic form
  - (4) Solid form
- Q.61** Which of the following is incorrect match :
- (1) Pulsation theory - J.C. Bose
  - (2) Relay pump theory - Godlewsky
  - (3) Imbibition theory - Von Sachs
  - (4) Capillary theory - Priestley
- Q.62** What tissue are removed when a plant is girdled :
- (1) Xylem & Pith
  - (2) Xylem & Phloem
  - (3) Phloem to epidermis
  - (4) Phloem to pith
- Q.63** Removal of a ring of bark from the trunk of a tree eventually kills it because-
- (1) Water can not go up
  - (2) Fungi & insects attack exposed parts
  - (3) Food does not travel down & root becomes starved
  - (4) Air blocks the xylem
- Q.64** Which would do maximum harm to a tree-
- (1) The loss of half of its leaves
  - (2) The loss of all of its leaves
  - (3) The loss of half of its branches
  - (4) The loss of its bark
- Q.65** Ringing experiment can not be done on a sugar cane plant because :
- (1) Its xylem is scanty
  - (2) Its phloem is with out phloem parenchyma
  - (3) Its vascular bundles are scattered
  - (4) Its phloem is present inside the xylem
- Q.66** In plants the translocation of organic solutes take place through :
- (1) Epidermis
  - (2) Xylem
  - (3) Phloem
  - (4) Pith
- Q.67** Most accepted theory for Ascent of sap given by-
- (1) Godlewski & Sachs
  - (2) J.C. Bose
  - (3) Stephan Hales
  - (4) Dixon and Joly
- Q.68** Ringing experiment is to show :
- (1) Path of ascent of sap
  - (2) Comparision of transpiration
  - (3) Passive absorption
  - (4) Stomatal opening & closing
- Q.69** The most acceptable view for explaining ascent of sap is :
- (1) Water cohesion transpiration pull or tension theory
  - (2) Capillary theory
  - (3) Relay pump theory
  - (4) Root pressure theory

## Water Relations of Plants

- Q.70** Ringing experiment was performed by-  
(1) Hartig (2) Malpighi (3) Dixon (4) All
- Q.71** The name of Dixon & Joly is associated with :  
(1) Absorption (2) Ascent of sap (3) Transpiration (4) All
- Q.72** During ascent of sap the movement of water is through :  
(1) Xylem (2) Phloem  
(3) Bark (4) Lumen of tracheids & trachea (vessels)
- Q.73** The conduction of water from root hair to root xylem is-  
(1) Symplastic (2) Apoplastic  
(3) Osmotically (4) Symplastic + Apoplastic
- Q.74** Blockage experiment of Dixon is concerned with-  
(1) Transpiration (2) Passive absorption  
(3) Path of ascent of sap (4) Vital theory for ascent of sap
- Q.75** The cavity of tracheids and trachea (vessels) through which water conducted, is called :  
(1) Lumen (2) Lignified walls  
(3) Cortical cell (4) Wood parenchyma
- Q.76** The Pulsation theory is related with :  
(1) Guttation (2) Bleeding  
(3) Vital theory for ascent of sap (4) Physical theory for ascent of sap
- Q.77** In plants, flow of sap takes place through :  
(1) Phloem (2) Xylem (3) Cambium (4) Epidermis
- Q.78** Root pressure theory was proposed by-  
(1) Priestley (2) Stephen Hales (3) Levitt (4) Sachs
- Q.79** Ascent of sap is affected by :  
(1) Transpiration (2) Absorption (3) Both (4) None of these
- Q.80** Blockage experiment for advancement of ringing experiment was done by-  
(1) Levitt (2) Steward (3) Hartig (4) Dixon
- Q.81** The most accepted theory for explaining mechanism of ascent of sap was propound by :  
(1) Godlewski (2) Boehm (3) Dixon and Joly (4) Priestley and Levitt
- Q.82** By which process absorbed water reaches upto the leaves :  
(1) Transpiration (2) Guttation (3) Root pressure (4) Ascent of sap
- Q.83** Ringing experiment was performed in :  
(1) Balsam (2) *Mirabilis*  
(3) Indian telegraph (4) *Avena*

## Water Relations of Plants

### TRANSPIRATION

- Q.84** Opening of stomata is due to :
- (1) Turgidity of guard cells
  - (2) Size of guard cells
  - (3) Number of guard cells
  - (4) Amount of CO<sub>2</sub> in the atmosphere
- Q.85** Transpiration in plants will be lowest when :
- (1) There is high humidity in the atmosphere
  - (2) High wind velocity
  - (3) There is excess of water in the soil
  - (4) Environmental conditions are very dry
- Q.86** The ion involved in the stomatal regulation is :
- (1) Iron
  - (2) Magnesium
  - (3) Zinc
  - (4) Potassium
- Q.87** The following percentage of water absorbed by herbaceous plants is lost in transpiration :
- (1) 80%
  - (2) 60%
  - (3) 40%
  - (4) 99%
- Q.88** Stomata are bound by a pair of guard cells and open stomata has guard cells :
- (1) Turgid
  - (2) Flaccid
  - (3) Green
  - (4) Large
- Q.89** Transpiration from plants would be most rapid when :
- (1) There is lot of humidity in atmosphere
  - (2) The air is still
  - (3) There is excess of water in sky
  - (4) Environmental conditions are dry
- Q.90** Of the processes which occur in leaves, the one which may lower their temperature is :
- (1) Respiration
  - (2) Photosynthesis
  - (3) Hydrolysis
  - (4) Transpiration
- Q.91** When Oak leaf stomata opens, process is :
- (1) Water molecules enter adjacent guard cells
  - (2) Atmosphere outside stomata become less humid
  - (3) Auxins are accumulated in guard cells
  - (4) Salt molecules are excreted by adjacent guard cells
- Q.92** The stomata open during day time because the guard cells :
- (1) Photosynthesize and produces osmotically active sugars
  - (2) Are thin walled
  - (3) Are bean shaped
  - (4) Have to help in gaseous exchange
- Q.93** Wilting of a plant result from excessive :
- (1) Respiration
  - (2) Photosynthesis
  - (3) Absorption
  - (4) Transpiration
- Q.94** The rate of transpiration is high when :
- (1) The atmosphere is saturated with water vapour
  - (2) Light is very dim
  - (3) The temperature is low
  - (4) The atmosphere is dry and the temperature is high

## Water Relations of Plants

- Q.95** Excessive loss of water causes wilting of leaves, it can be prevented by :
- (1) Keeping the plant in bright light
  - (2) Spraying the plant with alcohol
  - (3) Applying vaseline on the leaf surface
  - (4) Adding high amounts of fertilizers to the soil
- Q.96** Leaves that appear wilted in the day time recover at night because :
- (1) Light is essential for photosynthesis
  - (2) The stomata close down, temperature decrease, transpiration is reduced and the plant is able to absorb more water from the soil.
  - (3) Respiration and translocation of organic substance both increases
  - (4) The plant is sleeping because of dark conditions
- Q.97** Guard cells differ from epidermal cells in having-
- (1) Mitochondria
  - (2) Vacuoles
  - (3) Cell wall
  - (4) Chloroplast
- Q.98** Conversion of starch to organic acid is essential for-
- (1) Stomatal closure
  - (2) Stomatal opening
  - (3) Stomatal initiation
  - (4) Stomatal growth
- Q.99** Increase in CO<sub>2</sub> concentration around leaf results in :
- (1) Rapid opening of stomata
  - (2) Partial closure of stomata
  - (3) Complete closure of stomata
  - (4) No effect on stomatal opening
- Q.100** Which of the following wall of guard cells is thick :
- (1) Outer
  - (2) Inner
  - (3) Sidewall
  - (4) All the three
- Q.101** Potometer and clinostat are used to study :
- (1) Photosynthesis and Respiration
  - (2) Transpiration and Growth
  - (3) Phototropism and Geotropism
  - (4) Transpiration and Geotropism
- Q.102** The rate of transpiration will be high when there is-
- (1) Rainy season
  - (2) Winter season
  - (3) Summer season
  - (4) None of these
- Q.103** Which type of transpiration is more during night :
- (1) Cuticular
  - (2) Stomatal
  - (3) Lenticular
  - (4) Bark transpiration
- Q.104** Maximum transpiration is takes place through the-
- (1) Stomata
  - (2) Lenticel
  - (3) Hydathode
  - (4) Cuticle
- Q.105** The inter conversion of sugar & starch is dependent on pH changes in the guard cells; was demonstrated by :
- (1) Levitt
  - (2) Lloyd
  - (3) Sayre
  - (4) Steward
- Q.106** The spray of PMA causes :
- (1) Decrease in transpiration
  - (2) Increase in tranpiration
  - (3) Increase in absorption
  - (4) Increase in guttation

## Water Relations of Plants

- Q.107** When the stomata are opening; we observe following changes in the guard cells :  
(1) OP increase, TP decreases (2) OP & TP increases  
(3) OP decreases, TP increases (4) OP & TP decreases
- Q.108** The pH in the guard cells was observed when stomata were open it ranges :  
(1) 9-10 (2) 4-5 (3) 6-7 (4) 2-4
- Q.109** What will be the effects on stomata, if relative humidity is 100% in atmosphere :  
(1) Completely open (2) Partially open (3) No effects (4) Closed
- Q.110** Opening of stomata depends upon the change in turgidity of :  
(1) Guard cells (2) Epidermal cells (3) Subsidiary cells (4) Mesophyll cells
- Q.111** Which of the following is produced during water stress condition :  
(1) Cytokinin (2) ABA (3) Phytochrome (4) ATPase
- Q.112** Which chemical is used to detect transpiration :  
(1) Calcium carbonate (2) Cobalt carbonate  
(3) Cobalt chloride (4) Mercuric acetate
- Q.113** Which light is not active in stomatal movement :  
(1) White light (2) Red light (3) Blue light (4) Green light
- Q.114** Transpiring organ in plant is :  
(1) Cortex (2) Xylem (3) Phloem (4) Epidermis
- Q.115** Active K<sup>+</sup> ion exchange mechanism of opening and closing of stomata was given by-  
(1) Khorana (2) Scarth (3) Levitt (4) Kohli
- Q.116** Transpiration is minimised by the deposition of :  
(1) Cellulose (2) Pectin (3) Cutin (4) Mucilage
- Q.117** Epidermal or cuticular transpiration is significant in :  
(1) Xerophytes (2) Herbaceous plants (3) Trees (4) Shrubs
- Q.118** What is action spectrum of transpiration :  
(1) Green and U.V. (2) Blue and Yellow (3) Blue and far red (4) Blue and red
- Q.119** In which of the following plants, the metabolism will be hindered if upper surface of leaves are coated with wax :  
(1) *Hydrilla* (2) *Nymphaea* (3) *Vallisneria* (4) *Utricularia*
- Q.120** Guard cells of a closed stomata are :  
(1) Flaccid (2) Turgid (3) Large (4) None of the above
- Q.121** Transpiration will be most minimum when :  
(1) High atm. humidity (2) Low wind velocity  
(3) High CO<sub>2</sub> concentration (4) All of the above

## Water Relations of Plants

- Q.122** Which of the following substance serve as an anti-transpirant in plant :  
(1) Phenyl mercuric acetate (2) Aspirin  
(3) Silicon oil (4) All of these
- Q.123** Which of the atmospheric factor act as anti-transpirant :  
(1) SO<sub>2</sub> (2) CO (3) CO<sub>2</sub> (4) All pollutant gasses
- Q.124** Transpiration is a non-enzymatic process its Q<sub>10</sub> value is :  
(1) 1 (2) 2 (3) 3.5 (4) Zero
- Q.125** The most important factor affecting transpiration is :  
(1) Light (2) Temperature  
(3) Wind (4) Atmospheric humidity
- Q.126** Presence of thick cuticle, hairs scales & fewer sunken stomata are found in the leaves of xerophyte it is to -  
(1) Stop transpiration (2) Facilitate transpiration  
(3) Store water (4) Check excessive transpiration
- Q.127** Which factor regulates the loss of water through transpiration :  
(1) Nitrogen (2) Atmospheric CO<sub>2</sub> (3) Level of O<sub>2</sub> in air (4) Xylem
- Q.128** With increase in temperature the rate of transpiration becomes-  
(1) Low (2) High  
(3) Low in herbs and high in tress (4) Immediately stopped
- Q.129** Which of the following plant do not transpire :  
(1) Algae (2) Fungi  
(3) Submerged hydrophytes (4) All the above
- Q.130** Wilting of plant results from an excessive :  
(1) Absorption (2) Photosynthesis & poor osmosis  
(3) Respiration (4) Transpiration
- Q.131** Transpiration is completely absent in :  
(1) Hydrophytes (2) Mesophytes  
(3) Xerophytes in day (4) Succulents at night
- Q.132** Who stated "Transpiration to be an unavoidable evil" :  
(1) Blackmann (2) Steward (3) Priestley (4) Curtis
- Q.133** Which pigment regulates opening and closing of stomata :  
(1) Chlorophylls (2) Carotenoids (3) Phytochrome (4) Flavines
- Q.134** Which photo receptor controls the opening & closing of stomata-  
(1) Chlorophyll-a (2) Chlorophyll-b (3) Phytochrome (4) Carotene

## Water Relations of Plants

**Q.135** Stomatal pore has a wider opening in :

- (1) Far red light                      (2) Blue light                      (3) Green light                      (4) Yellow light

**Q.136** Light promotes transpiration because-

- (1) It promotes photosynthesis  
(2) It increases temperature of surrounding atmosphere  
(3) It influences stomatal opening  
(4) It promotes absorption of water by plant

**Q.137** For plants transpiration is :

- (1) Not very important                      (2) Important to some  
(3) A necessary evil                      (4) An important burden

**Q.138** Significance of transpiration lies in-

- (1) Circulation of water                      (2) Absorption and distribution  
(3) Regulating the temperature of the plant body  
(4) All of the above.

**Q.139** In apple type of stomata :

- (1) Stomata are present only on the upper surface of leaf  
(2) Stomata are present only on the lower surface of leaf  
(3) Stomata are present on both surfaces of leaf  
(4) Stomata are vestigial

**Q.140** Which of the following plant product act as an internal anti-transpirant-

- (1) Phenyl mercuric acetate                      (2) CO<sub>2</sub> and malic acid  
(3) Abscisic acid                      (4) Ferulic acid

**Q.141** In the mechanism of opening of stomata, the & important factor is-

- (1) Shape of the guard cells                      (2) Chlorophyll content of the guard cells  
(3) Hormone content of the subsidiary cells                      (4) Protein content of the epidermal cells

**Q.142** Stomata open at day because in day the guard cells have-

- (1) To help gas exchange  
(2) A low pH  
(3) A high level of sugar, organic acid ATP & K<sup>+</sup> ion  
(4) Unequally thickened walls

**Q.143** Basis of stomatal opening is-

- (1) Exosmosis                      (2) Endosmosis  
(3) Decrease in cell sap concentration                      (4) Plasmolysis of guard cells

**Q.144** Guard cells are found in :

- (1) Stomata                      (2) Hydathodes                      (3) Both                      (4) None of the above

**Q.145** Shape of guard cells in grass family :

- (1) Kidney shaped                      (2) Oval                      (3) Round                      (4) Dumbell shaped

## Water Relations of Plants

**Q.146** Stomata occurs in :

- (1) Succulent xerophytes
- (2) Hydrophytes
- (3) Mesophytes
- (4) None of the above

**Q.147** With decrease in atmospheric pressure the rate of transpiration will-

- (1) Remain unaffected
- (2) Increased
- (3) Decrease slowly
- (4) Decrease rapidly

**Q.148** Which of the following statement is not true :

- (1) Transpiration is increased when root shoot ratio is increased
- (2) Transpiration is increased when latex & mucilage is increased in tissue
- (3) Transpiration is decreased when stomata are sunken
- (4) Transpiration is decreased when leaves become leathery or hairy

**Q.149** Which one of the following will reduce the rate of transpiration :

- (1) Increase in wind velocity
- (2) Rise in temperature
- (3) Increase in water uptake by plants
- (4) Decrease in light intensity

**Q.150** The most important function of transpiration in plants is to cause :

- (1) Loss of surplus water
- (2) Cooling of the plant
- (3) Rapid ascent of sap
- (4) Rapid rise of minerals

**Q.151** Which of the following plants economises transpiration or loss of water :

- (1) C<sub>3</sub>-plants
- (2) C<sub>4</sub>-plants
- (3) Both equally
- (4) C<sub>2</sub>-plants

**Q.152** The change in turgor pressure which causes the opening and closing of stomata is caused by-

- (1) Reversible starch sugar conversions
- (2) Reversible absorption and loss of K-ions
- (3) Reversible loss and uptake of chloride ions
- (4) None of these

**Q.153** The "proton transport concept" for the opening of photo active stomata was given by-

- (1) Yin tung
- (2) Levitt
- (3) Sachs
- (4) Sayre

**Q.154** According to Scarth the opening & closing of stomata is governed by-

- (1) pH
- (2) Phosphorylation
- (3) NADPH<sub>2</sub>
- (4) Enzymes

**Q.155** Before opening of stomata accumulation of the following ion is seen in :

- (1) PO<sub>2</sub>
- (2) K<sup>+</sup>
- (3) Mg<sup>++</sup>
- (4) Na<sup>+</sup>

**Q.156** Which of the following factors increases the transpiration :

- (1) High temperature
- (2) High wind velocity
- (3) Low relative humidity
- (4) All of the above

## Water Relations of Plants

- Q.157** In succulent plants the stomata opens at night and closes by day. Which of following would be best hypothesis to explain the mechanism of stomata opening at night only-
- (1)  $\text{CO}_2$  used up, increased pH results in accumulation of sugars
  - (2)  $\text{CO}_2$  accumulates, reduces pH stimulates enzymes resulting in accumulation of carbohydrate
  - (3) Increase in  $\text{CO}_2$  concentration, conversion of organic acids into starch resulting in the increased uptake of potassium ions and water.
  - (4) High  $\text{CO}_2$  concentration causes accumulation of organic acids in guard cells resulting in to the increased concentration of cell sap.
- Q.158** Guard cells differ from other epidermal cells in having-
- (1) Large vacuoles
  - (2) Secondary walls
  - (3) Chloroplast with PEP-carboxylase enzyme
  - (4) Absence of mitochondria
- Q.159** The trunk of a tree shrinks in day due to-
- (1) Rapid translocation of food
  - (2) Transpiration induced tension
  - (3) Rapid growth in day hours
  - (4) Light induced elongation of plant
- Q.160** Which of the following is not a controllable process :
- (1) Stomatal transpiration
  - (2) Passive absorption
  - (3) Osmosis & guttation
  - (4) Wilting
- Q.161** Potometer is used for measuring :
- (1) Light intensity
  - (2) Transpiration rate
  - (3) Growth rate
  - (4) Photosynthetic
- Q.162** Apparatus used for measuring the transpiration :
- (1) Evapometer
  - (2) Potometer
  - (3) Osmometer
  - (4) Tensiometer
- Q.163** Transpiration occurs from :
- (1) Leaves
  - (2) Stems
  - (3) All parts
  - (4) All aerial parts
- Q.164** In succulent plants the stomata opens at night & closes by day. Which of the following would be best hypothesis to explain the mechanism of stomata opening at night only :
- (1) Increase in  $\text{CO}_2$  concentration, conversion of organic acids into starch resulting in the increased uptake of potassium ions & water
  - (2) High  $\text{CO}_2$  concentration causes accumulation of organic acids in guard cells resulting into the increased concentration of cell sap.
  - (3)  $\text{CO}_2$  used up, increased pH results in accumulation of sugars.
  - (4)  $\text{CO}_2$  accumulates, reduces pH, stimulates enzymes resulting in accumulation of carbohydrates.
- Q.165** Where stomata are present in leaves of submerged hydrophytes :
- (1) On both surfaces
  - (2) In upper surface
  - (3) In lower epidermis
  - (4) Totally absent
- Q.166** Folding and unfolding of leaves of many grasses due to-
- (1) Passage cells
  - (2) Motor cells
  - (3) Transfusion cells
  - (4) Transfer cells
- Q.167** Leaves of submerged hydrophytes are :
- (1) Epistomatic
  - (2) Hypostomatic
  - (3) Astomatic
  - (4) Above 1 & 2

## Water Relations of Plants

- Q.168** The diffusion of water vapours through aerial parts of the plants is called :  
(1) Osmosis (2) DPD (3) Transpiration (4) All
- Q.169** If the absorption is more, but transpiration is less; then process affected will be :  
(1) Root pressure (2) Guttation (3) Bleeding (4) All
- Q.170** Active  $K^+ \nless H^+$  exchange theory explains -  
(1) Ascent of sap (2) Phloem conduction (3) Ion absorption (4) Stomatal movement
- Q.171** Transpiration is a necessary evil, given by-  
(1) Levitt (2) Curtis (3) Steward (4) Sachs
- Q.172** Which of the following theory gives the latest explanation for closure of stomata :  
(1) ABA theory (2) Munch theory  
(3) Starch glucose theory (4) Active  $K^+$  transport theory
- Q.173** Potassium ions concentration is more in guard cells when stomata are open but less when stomata are closed. This was reported by :  
(1) Hsio, Fisher (2) Fujino (3) Levitt (4) Lloyd
- Q.174** Potassium ions concentration is more in guard cells, when stomata are open. This was firstly discovered by :  
(1) Hsio, Fisher (2) Levitt (3) Lloyd (4) Fujino
- Q.175** The loss of water in the form of water drops is taking place through the :  
(1) Hydathode (2) Lenticel (3) Stomata (4) All
- Q.176** The opening of stomata is mainly based on :  
(1) Photosynthesis (2) Turgidity of guard cells  
(3) Efflux of  $K^+$  (4) Formation of starch
- Q.177** The potometer is based on the principle that :  
(1) Transpiration is based on stomatal opening  
(2) Stomata open during day time  
(3) Absorption = Transpiration  
(4) Transpiration tension present in leaves
- Q.178** Guttation is dependent on :  
(1) Root pressure (2) Active absorption  
(3) Turgidity of root cortical cells (4) All of these
- Q.179** Due to increasing temperature, transpiration :  
(1) Increases (2) Decreases  
(3) First increases then decreases (4) Unaffected
- Q.180** If temperature remains constant then with increasing altitude, the transpiration will :  
(1) Increases (2) Decreases  
(3) First increases then decreases (4) Unaffected

## Water Relations of Plants

**Q.181** The most effective light in stomatal opening is :

- (1) Blue light                      (2) Red light                      (3) Green light                      (4) Any

**Q.182** According to Sayre & Scarth the opening & closing of stomata is governed by-

- (1) ATP                                  (2) NADPH<sub>2</sub>                                  (3) K<sup>+</sup>                                  (4) pH

**Q.183** Under what condition transpiration would be most rapid-

- (1) Excess of water in the soil                                  (2) Low temperature & high humidity  
(2) Bright light & high CO<sub>2</sub>                                  (4) High temperature & low relative humidity

**Q.184** The conversion of starch to organic acid is essential for stomatal :

- (1) Closure                                  (2) Growth                                  (3) Initiation                                  (4) Opening

**Q.185** Abscisic acid treatment result in :

- (1) Stomatal closure                                  (2) Stomatal opening  
(3) Turgidity in guard cells                                  (4) Wider opening of stomata

**Q.186** K<sup>+</sup> influx - efflux theory was mainly formulated by :

- (1) Hiso & Fisher                      (2) Sayre                                  (3) Steward                                  (4) Cowans

**Q.187** Transpiration increases when atmospheric temperature rises, due to :

- (1) Wider opening of stomata  
(2) Stomatal opening becomes narrow  
(3) Water holding capacity of the air increases  
(4) More photosynthesis in guard cells

**Q.188** The names of Yin & Tung are associated with findings of :

- (1) Phosphorylase enzyme  
(2) Sugar - starch conversion  
(3) Localization of phosphorylase enzyme in gaurd cells  
(4) Exchange of K<sup>+</sup> & H<sup>+</sup>

**Q.189** Due to more wind velocity, the transpiration rate will be :

- (1) Less    (2) More  
(3) Unaffected                                  (4) First decreases then increases

**Q.190** If the humidity in the atmosphere is increased, the rate of transpiration in the given plant will be :

- (1) Increased                                  (2) Unaffected  
(3) Decreased                                  (4) First increased then decreases

**Q.191** PMA is :

- (1) Photosynthetic product                                  (2) Antitranspirant  
(3) Chelate    (4) Mineral nutrient

**Q.192** The conversion of sugar into starch is mainly dependent on :

- (1) Photosynthesis                                  (2) pH of the guard cells  
(3) Chelate    (4) Mineral nutrient

## Water Relations of Plants

**Q.193** Deposition of cutin over the aerial surface of plant organs is called :

- (1) Cutinization                      (2) Deposition                      (3) Layering                      (4) Cuticularization

**Q.194** Foliar transpiration :

- (1) Includes stomatal and cuticular transpiration  
(2) Does not occur  
(3) Includes all type of transpiration  
(4) Shows stomatal transpiration

**Q.195** Lenticular transpiration is more related with-

- (1) Foliar transpiration                      (2) Secondary growth  
(3) Bark transpiration                      (4) Lenticel formation

**Q.196** Radial micellation of cellulose occurs at-

- (1) Outer wall of guard cells                      (2) Inner wall of guard cells  
(3) Inner wall of subsidiary cells                      (4) None of these

## GUTTATION, BLEEDING, ROOT PRESSURE, WILTING

**Q.197** Root pressure is maximum, when :

- (1) Transpiration is high and absorption is very low  
(2) Transpiration is very low and absorption is very high  
(3) Absorption is very high and transpiration is also very high  
(4) Absorption is low and transpiration is also very low

**Q.198** Wilting in plant occurs when :

- (1) Xylem is blocked                      (2) Epidermis is peeled off  
(3) Pith is removed                      (4) Phloem is blocked

**Q.199** Pressure exerted on the fluid contents of the cortical cells of root by turgidity which forces the water into xylem vessels and upward in to the stem for a certain height is :

- (1) Imbibition                      (2) Root pressure                      (3) Capillarity                      (4) Turgor presure

**Q.200** Which is responsible for guttation :

- (1) Osmosis                      (2) Root pressure                      (3) Transpiration                      (4) Photosynthesis

**Q.201** The process of the escape of liquid from the tip of uninjured leaf is called :

- (1) Evaporation                      (2) Transpiration                      (3) Guttation                      (4) Evapo transpiration

**Q.202** Guttation is the process of elimination of water from plants through :

- (1) Stomata                      (2) Hydathodes                      (3) Lenticels                      (4) Wounds

**Q.203** Guttation take place during night when :

- (1) Root pressure is positive                      (2) Root pressure is negative  
(3) Always take place                      (4) It does not takes place at all

**Q.204** Guttation is takes place mainly due to :

- (1) Transpiratin                      (2) Root pressure                      (3) Imbibition                      (4) Respiration

## Water Relations of Plants

- Q.205** During early in the morning; we observe water drops on the leaf margin, this shows-  
(1) Transpiration            (2) Root pressure            (3) Imbibition            (4) Respiration
- Q.206** The hydathodes are related with :  
(1) Transpiration            (2) Guttation            (3) Bleeding            (4) All
- Q.207** Who discovered root pressure :  
(1) Stephen Hales            (2) Priestley            (3) Dixon            (4) Renner
- Q.208** Root pressure can be measured by the instrument :  
(1) Potometer            (2) Auxanometer            (3) Manometer            (4) Barometer
- Q.209** In summer afternoon, rate of transpiration is greater than the rate of absorption then what happens to plant :  
(1) Temporary wilting            (2) No effect  
(3) Leaves becomes yellow            (4) Plant will die
- Q.210** Which conditions favours "Guttation" :  
(1) High water absorption            (2) High transpiration  
(3) Low transpiration            (4) 1 and 3 both
- Q.211** When stem of a herbaceous plant is cut, water or sap Oozes out, this is due to :  
(1) Guttation            (2) Transpiration pull            (3) Root pressure            (4) Imbibition
- Q.212** Maximum bleeding occurs in :  
(1) Agave            (2) *Vitis*            (3) *Betula*            (4) *Caryota urens*
- Q.213** Guttation usually occurs in a well watered herbaceous plant and well drained soil only in :  
(1) Morning hours            (2) Evening hours            (3) Noon hours            (4) Day hours
- Q.214** Hydathodes open during :  
(1) Night hours            (2) Day hours            (3) Noon hours            (4) Always open
- Q.215** The "Guttation" word was given by :  
(1) Bergerstein            (2) Sayre            (3) Scarth            (4) Stephen Hales
- Q.216** Which of the following is not a rhythmic phenomenon :  
(1) Stomatal transpiration            (2) Guttation  
(3) Nyctinasty            (4) Photonastic movements
- Q.217** Water of guttation is :  
(1) Pure water            (2) Water with dissolved salts  
(3) Solution of organic food            (4) Condensed water vapour
- Q.218** Hydathodes found in -  
(1) Stem            (2) Leaves            (3) Root            (4) Cortex

## Water Relations of Plants

**Q.219** Root pressure developed in any plant is due to :

- (1) Transpiration pull
- (2) Higher turgidity in root cortical cells
- (3) DPD gradation
- (4) Water cohesion

**Q.220** In plant water relations; the name of Stephen Hales is associated with :

- (1) Ascent of Sap
- (2) Absorption
- (3) Root pressure
- (4) Bleeding

**Q.221** Guttation is takes place through :

- (1) Lenticel
- (2) Hydathode
- (3) Stomata
- (4) Wound

**Q.222** Guttation is mainly related with -

- (1) Root pressure
- (2) Transpiration
- (3) Ascent of sap
- (4) Absorption

**Q.223** Cells present on hydathodes is-

- (1) Complementary cells
- (2) Epithem cells
- (3) Guard cells
- (4) Krantz cells

**Q.224** The process involved in the formation of toddy is :

- (1) Guttation
- (2) Transpiration
- (3) Bleeding
- (4) All

**Q.225** Epithem tissue is related with :

- (1) Photosynthesis
- (2) Respiration
- (3) Guttation
- (4) Transportation

**Q.226** Guttation is loss of water in form of :

- (1) Pure water
- (2) Water vapours
- (3) Aqueous solution
- (4) Distilled water

**Q.227** The whitish powder around hydathode is due to-

- (1) Guttation
- (2) Salt deposition from air
- (3) Salt formation over surface
- (4) Bleeding

**EXERCISE # 1**

<b>Que.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
<b>Ans.</b>	1	2	1	1	3	2	1	4	4	2	3	1	2	1	4
<b>Que.</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>Ans.</b>	4	3	2	1	1	2	1	1	2	2	3	1	3	3	1
<b>Que.</b>	<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>
<b>Ans.</b>	4	3	3	1	1	4	3	1	1	3	1	3	4	4	3
<b>Que.</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>
<b>Ans.</b>	1	3	2	3	2	4	2	2	3	1	4	2	3	3	3
<b>Que.</b>	<b>61</b>	<b>62</b>	<b>63</b>	<b>64</b>	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>	<b>70</b>	<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>75</b>
<b>Ans.</b>	4	1	3	1	1	2	3	1	2	1	4	3	1	4	3
<b>Que.</b>	<b>76</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>80</b>	<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>	<b>86</b>	<b>87</b>	<b>88</b>	<b>89</b>	<b>90</b>
<b>Ans.</b>	2	4	4	3	1	2	3	2	4	4	3	2	3	1	2
<b>Que.</b>	<b>91</b>	<b>92</b>	<b>93</b>	<b>94</b>	<b>95</b>	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>100</b>	<b>101</b>	<b>102</b>	<b>103</b>	<b>104</b>	<b>105</b>
<b>Ans.</b>	4	4	2	2	3	4	4	4	3	3	3	1	3	2	4
<b>Que.</b>	<b>106</b>	<b>107</b>	<b>108</b>	<b>109</b>	<b>110</b>	<b>111</b>	<b>112</b>	<b>113</b>	<b>114</b>	<b>115</b>	<b>116</b>	<b>117</b>	<b>118</b>	<b>119</b>	<b>120</b>
<b>Ans.</b>	3	4	1	4	4	2	1	2	2	1	1	1	3	2	3
<b>Que.</b>	<b>121</b>	<b>122</b>	<b>123</b>	<b>124</b>	<b>125</b>	<b>126</b>	<b>127</b>	<b>128</b>	<b>129</b>	<b>130</b>	<b>131</b>	<b>132</b>	<b>133</b>	<b>134</b>	<b>135</b>
<b>Ans.</b>	3	1	2	1	2	4	1	3	3	2	3	3	2	4	3
<b>Que.</b>	<b>136</b>	<b>137</b>	<b>138</b>	<b>139</b>	<b>140</b>	<b>141</b>	<b>142</b>	<b>143</b>	<b>144</b>	<b>145</b>	<b>146</b>	<b>147</b>	<b>148</b>	<b>149</b>	<b>150</b>
<b>Ans.</b>	2	3	3	2	2	1	1	3	1	2	4	2	4	3	3
<b>Que.</b>	<b>151</b>														
<b>Ans.</b>	1														

## Water Relations of Plants

### EXERCISE # 2

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	4	1	3	3	1	1	2	4	3	2	3	1	1	4	3
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	3	3	2	1	2	2	3	1	1	3	2	3	1	3
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	3	4	4	1	2	2	4	3	4	2	1	1	3	4	1
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	1	3	4	3	2	2	3	1	1	4	2	1	3	3	2
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	4	3	3	4	3	3	4	1	1	4	2	4	4	3	1
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	3	2	1	3	4	3	4	3	1	1	4	4	1	4	4
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Ans.	1	1	4	4	3	2	4	2	2	2	4	3	1	1	3
Que.	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	1	3	3	1	1	2	3	4	4	3	3	2	4	2	1
Que.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
Ans.	1	4	3	2	4	4	2	2	4	4	3	2	3	3	2
Que.	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
Ans.	3	3	4	2	3	1	3	2	1	4	1	2	2	4	2
Que.	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
Ans.	2	2	2	1	2	4	4	3	2	3	2	2	4	2	4
Que.	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	2	3	3	4	4	2	1	2	4	1	2	3	1	3	1
Que.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
Ans.	1	4	4	4	1	1	3	3	2	3	2	2	1	1	3
Que.	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
Ans.	2	2	1	2	2	3	2	1	2	3	2	1	3	1	4
Que.	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
Ans.	3	4	1	4	1	2	2	2	2	3	2	1	2	3	3
Que.	226	227													
Ans.	3	1													