OSMOTIC RELATION OF PLANTS EXERCISE

DIFFUSION, OSMOSIS &RELATED TERATED

1. The physical process involved in the release of molecular oxygen from leaves is :-
   (1) Diffusion (2) Transpiration
   (3) Osmosis (4) Capillarity

2. Who is called father of plant physiologt ?
   (1) K.V.Thimann (2) Stephan Hales
   (3) M.Calvin (4) E.Rabinowitch

3. Who is called father of Indian plant physiology ?
   (1) J.C.Bose (2) Calvin
   (3) R.Mishra (4) K.K.Nanda

4. One molar solution of which substance will have maximum O.P :-
   (1) NaCl (2) glucose
   (3) Fructose (4) Starch

5. Pieces of beet root do 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

6. The movement of molecules from their higher concentration to lower concentration is called :-
   (1) Osmosis (2) Diffusion
   (3) DPD (4) DPG

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 solvent molecule is not specified
   (2) There is no mention of DPD
   (3) Behavior of semi permeable membrane is not specified
   (4) The exact concentration of solutions are not indicated

8. What statement can be cited for 10% sodium chloride solution and 10% sugar solution present ?
   (1) Both concentration of sodium
   (2) The concentration of sodium chloride solution will be less than Concentration 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

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

10. If a cell swells, after being placed in solution, the solution is :-
    (1) Neutral (2) Hypotonic
    (3) Hypertonic (4) Isotonic

11. Osmosis means :-
    (1) Solute from low concentration to higher
    (2) Solute from higher concentration of low
    (3) Solvent from low concentration solution to higher cone of solution
    (4) Solvent from higher concentration solution to low concentration solution

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

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

14. A cell increases in volume if the external medium is
    (1) Hypotonic
    (2) Slightly hypertonic
    (3) Isotoic
    (4) Much more concentrated than the protoplasm of the cell

15. Osmosis involces diffusion of :-
(1) Suspended particles from higer 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

16. Acell 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 move out cell by exosmosis

17. Grapes placed in salt solution shrink due to :-
(1) Imbibitions (2) Endosmosis
(3) Exosmosis (4) Osmosis

18. Process of selective transmission of a liquid through semi permeable membrane is called :-
(1) Diffusion (2) Osmosis
(3) Plasmolysis (4) Transmission

19. Water enters into the root hair from the soil its normal condition because the 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

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 0.3M solution. The osmotic concentration of vacuolar sap, therefore :-
(1) 0.3 M
(2) Greater than o.3 M
(3) Less than 0.3 M
(4) Not related at all to the out side solution

21. Which help in maintaining form and structure of cells & soft parts of plants ?
(1) Osmotic pressure
(2) Turgor pressure
(3) Atmospheric pressure
(4) DPD

22. Who propounded the concept of osmosis ?
(1) Abbe Nollet (2) Mayer
(3) Dixon and jolly (4) Renner

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

24. Plasma membrane controls :-
(1) Plasma membrane controls :-
(2) Passage of water and solutes in and out of the cell
(3) Passage of water and solutes in to the cell
(4) Movement of cell contents out the cell

25. Which process occurs against a concentration gradient of solute ?
(1) Diffusion (2) Osmosis
(3) Transpiration (4) Translocation

26. When a plant cell is placed in a hypotonis solution. Which of the following will not apply ?
(1) Wall pressure is decreased
(2) The cell become turgid
(3) Suction pressure of the cell sap willdecrease
(4)Water potential of the cell sap will increase

27. When beet root slces washed and then placed in cold water. Anthocyanin does not come out, because plasma memeable is
(1) Diffferentially permeable to anthocyanin
(2) Dead structure
(3) Impermeable to anthocyanin
(4) Permeable to anthocyanin

28. Osmotic pressure is highest in :-
(1) Xerophytes (2) Lithophytes
(3) Halophytes (4) Mesophytes

29. 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

30. Osmosis means :=
(1) Movement of moleculels from higher concentration to lower concentration
(2) Uptake of water by roots
(3) Passage of solution from a weaker solution to stronger solution across a semipermeable m embrane
(4) Passage of solvent from a weaker to a stronger solution separated by a membrane

31. The osmotic pressure of distilled water will be :-
(1) Minimum (2) Maximum
(3) Higher than any solution (4) Variable

32. Tonoplast is :-
(1) Permeable membrane
(2) Semi permeable membrane
(3) mpermeable membrane
(4) Selectively permeable membrane

33. If in acell suction pressure value is 30 atm . while osmotic pressure 42 atm . then calculate the turgidity developed in form of TP in the cell :-
(1) 12 atm. (2) 72atm
(3) -12 atm. (4) 1.4 atm.

34. If the molar concentration of 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

35. Osmosis is the phenomenon expressed by :-
(1) Solutes present in the solution
(2) Solution
(3) Semi-permeable membrane
(4) O_2

36. The osmotic pressure of the cell is measured by :-
(1) Plasmolysis method
(2) Osmometer
(3) Molar concentration of the cell sap
(4) Deplasmolysis

37. When grapes are placed in water, then which process occurs ?
(1) Plasmolysis
(2) Exosmosis
(3) Endosmosis
(4) None of the above

38. Maximum osmotic pressure is found I :-
(1) Root hair
(2) Cortex cell of the root
(3) Passage cell of the root
(4) Mesophyll cell

39. The osmotic pressure is due to :-
(1) Solute
(2) Semi permeable membrane
(3) Hypertonic solution
(4) Water

DPD (SP)

40. When a cell is fully turgid which of the following will be zero ?
(1) Turgor pressure
(2) Wall pressure
(3) Suctionpressure
(4) Osmoticpressure

41. Water from the soil enter in to the hairs on account of :-
(1) Turgor pressure
(2) Suction pressure or DPD
(3) Barometric pressure
(4) Osmotic pressure

42. In a fully turgid cell the values of DPD, OP and TP should be :-
(1) DPD=10 atm, OP=15 atm, TP-5atm.
(2) DPD=5atm,OP=10a tm, TP=7atm.
(3) DPD-5atm,OP=7atm , TP=5atm.
(4) DPD=2atm,OP=15atm,TP-15-15atm.

43. When the cell is placed in water, it takes water this is due to ?
(1) Osmotic pressure
(2) Srctionpressure
(3) Diffusion
(4) Water potential and TP

44. What is the direction of the movement of water it 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 T.P. to lower TP
(4) Data insufficient

45. The hydrostatic pressure developed in the cell is called :-
(1) Turgor pressure
(2) Wall pressure
(3) Osmotic pressure
(4) Suction pressure

46. In fully cell :-
(1) DPD=WP (2) DPD=OP
(3) DPD=OP-TP (4) DPD=0

47. In flaccid cell :-
(1) DPD=WP (2) DPD=OP
(3) DPD=0 (4) DPD=OP-TP

48. Turgor pressure of a plasmolysed cell is :-

(1) Positive (2) Zero
(3) Negative (4) None of these

49. When water enters into in to a cell what happens to its OP. TP and DPD ?
(1) OP&TP increase & its DPD increase
(2) OP&DPD increase& decrease
(3) OP&DPD decrease &OP increase
(4) OP&DPD decrease & TP increase

50. What is the value of DPD of a cell ?
(1) DPD=OP×TP (2)DPD=OP+TP
(3) DPD=OP-TP (4) DPD=OP÷TP

51 Under natural conditions the osmotic pressure is :-
(1) More than turgor pressure
(2) Less than turgor pressure
(3) Equal to turgor pressure
(4) zero

52. What maintains the shape of a cell ?
(1) Osmotic pressure
(2) Turgor pressure
(3) Suction pressure
(4) Wall-pressure

53. Osmotic potential is numerically equal to :-
(1) Turgor pressure (2) Wall pressure
(3) Osmotic pressure (4) D.P.D

54. You are giventhree cells, a root hair , a cell of the inner corticallayer and a cell to the mespohyll arrange hem in ascending oeswe od SPS
(1) Root hair < Cortical cell < Mesophyll
(2) Cortical cell < Mesophyll < Root heir
(3) Mesophyll < Root hair < Cortical cell
(4) Root hair < Mesophyll < Cortical cell

55. Osmotic pressure is highest in :-
(1) Atriplex confertifolia
(2) Salsola foetida
(3) Rhizophora
(4) Chenopodium

56 The direction of the movement of water :-
(1) From low OP to OP
(2) From low DPD to high DPD
(3) From high DP to low DP
(4) All of the above

57. The term “DPD” was coined by:-
(1) Renner (2) Kramer
(3) B.S.mayer (4) Stephen hales

58. 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 imbibitions
(4) Concentration of ions in water

59. The three cells S.B& C are joined in a linear manner. Demonstrate the movement of water & direction in these ?
(1) $A \rightarrow B \rightarrow C$ (2) $A \leftarrow B \leftarrow C$
(3) $A \rightarrow B \leftarrow C$ (4) $A \leftarrow B \rightarrow C$

60. When the solute has been added in the solution, then following observation can be made ?
(1) The DPD of the solution decreases
(2) The Ψw of the solution increases
(3) DPD of the solution decreases while its Ψw increases
(4) DPD of the solution increases while its Ψw decreases

61. If the given solution is of 25% concentration, then what cannot be presented for this :-
(1) OP (2) DPD
(3) Solute potential (4) TP

62. In a flaccid cell which condition does not occur-
(1) TP=0 (2) SP=0
(3) WP=0 (4) SP=OP

63. 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

64 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

65. 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

66. Select the correct statement –
(1) Pure water has minimum Ψw
(2) Pure water has maximum Ψw
(4) Pure water has maximum D.P.D.
(3) Pure water has variable Ψw & D.P.D.

67. The best condition by which fully turgid cell can be identified is :-
(1) TP is minimum (2) SP is maximum
(3) OP less the SP (4) TP=OP

PLASMOLYSIS & OERMEABILITY

68. Plasmolysis can be used for :-
(1) Good growth of plants
(2) Good growth of weeds
(3) Killing the weeds
(4) None of the above

69. Along with plasmolysis which decreases in the cell –
(1) Osmotic pressure (2) Diffusion pressure
(3) Imbibitions pressure (4) Turgor pressure

70. 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) Deplasmolysis

71. If there is high amount of fertilizer 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

72. 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

73. When a plant cell is placed in a hypertonic solution it becomes plasmolysed what shall be be present between cell wall and plasmalemma at this stage ?
(1) Water and air (2) Cell sap
(3) Hypertonic solution (4) Solutes

74. 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 plasmolvsed and death occurs
(4) Nutrients in the pickle medium can not support life

WATER POTENTIAL

75. Value of water potential for pure water is :-
(1) 1 (2) 2
(3) 3 (4) Zero

76. Water potential is affected by :-
(1) Osmotic potential (2) Matric potential
(3) Pressure potential (4) All of the above

77. When the solute has been added to the solution ; it water potential will ?
(1) Increases
(2) Decreases
(3) Remain unchanged
(4) First increases then decreases

78. Water potential of a cell when its placed in hypertonic solution :-
(1) Decreases
(2) Increases
(3) First increases then decreases
(4) No change

79. Osmotic potential (ΨS) of a solution is always :-
(1) Positive (2) Negative
(3) Zero (4) Variable

80. Water potential (Ψ) of a solution is always :-
(1) +Ve (2) -Ve
(3) Zero (4) Variable

81. When the water potential of a cell become zero. It is said to be in ?
(1) Fully turgid state
(2) Flaccid state
(3) Incipiently plasmolysed state
(4) Completely plasmolysed state

82. A root hair cell under ordinary conditions have a water potential in the range of :-
(1) -1 to -4 atm. (2) -1 to +4 atm.
(3) -1to2 atm. (4) -1 to 2atm.

83. Why hygroscopic water is not available to plants ?
(1) Because its $\Psi\omega$ is greatly increased
(2) Because its DPD is greatly decreased

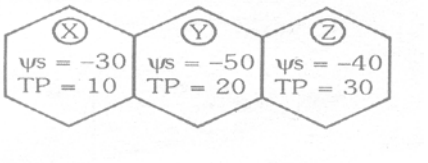
(3) Because $\Psi\omega$ becomes strongly negative
(4) Because its $\Psi\omega$ is increased and DPD is decreased

84. The concept of water potential was propounded by :-
(1) Robert mayer (2) Abbe Nollet
(3) Slatyer &Tatlor (4) Levitt

85. The solute potential can be determined in a simple manner by
(1) Water potential
(2) DPD
(3) Osmotic pressure
(4) Suction pressure

86. The accurate equation for presenting water potential is :-
(1) $\Psi\omega = \Psi s + \Psi p + \Psi m$
(2) $\Psi s = \Psi\omega + \Psi p + \Psi m$
(3) $\Psi\omega = \Psi s - \Psi p - \Psi\omega$
(4) $\Psi\omega = -\Psi s - \Psi p - \Psi m$

87. The direction of the water flow in given cells X,T & Z can be presented as :-
(1) $X \rightarrow Y \leftarrow Z$
(2) $X \rightarrow Y \rightarrow Z$
(3) $X \leftarrow Y \leftarrow Z$
(4) $X \leftarrow Y \rightarrow Z$



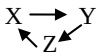
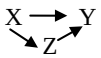
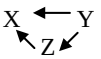
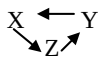
88. The water potential & osmotic potential of pure water is :-
(1) 100&zero (2) Zero & zero
(3) 100&200 (4) Zero&100

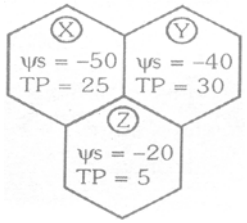
89. The relationship between DPS& Ψw can be expressed as :-
(1) DPD= Ψw (2) Ψw -DPD=0
(3) $\frac{DPD}{\Psi w} = 0$ =0 (4) Ψw = - DPD

90. Solute potential can be presented as :-
(1) $\Psi s = -OP$ (2) $\Psi s = OP$
(3) $OP - \Psi s = 0$ (4) $\frac{\Psi s}{OP} = 0$

91. In plant water relations , Ψ indicates –
(1) DPD (2) Solute potential
(3) Water potential (4) Suction pressure

92. If the solute is added in the given solution than what observation can be made :-
(1) Its DPD decrease
(2) It's water potential decreases
(3) DPD & water potential remains unchanged
(4) Its water potential increases

93. If three cells X,Y and Z are joined to each other & their solute potential & Turgor pressure values are given in the figure ; the demonstrate the direction of flow of water in this system :-
(1) 
(2) 
(3) 
(4) 



94. in 0.1 M solution of a non electrolyte , Ψw value will be :-
(1) zero bar (2) +2.3bar
(3) -203 bar (4) -22.4 bar

95. If a cell is placed in a hypertonic solution then Ψw of the cell will be ;-
(1) Increased
(2) Decreased
(3) Unchanged
(4) First increased then decreased

96. The Ψw of pure water is :-
(1) Minimum (2) Less than DPD
(3) Maximum (4) Variable

97. 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

IMBIBITION

98. Seeds swell when placed in water due to :-
(1) Osmosis (2) Imbibition
(3) Hydrolysis (4) All of these

99. During rainy season wooden doors generally swell up due to :-
(1) Osmosis (2) Imbibition
(3) Bad workmanship (4) Wood quality

100. Imbibition process involves:-
(1) Both diffusion and capillary action
(2) Only diffusion
(3) Only capillary action

(4) None of the above

101. The most powerful imbibant is:-
(1) Agar-agar (2) Proteins
(3) Cellulose (4) Lignin

102. Swelling of wooden planks and door-penals during the rainly season is due to :-
(1) Imbibition (2) Endosmosis
(3) Deplasmolysis (4) Diffusion

103. First step of influx of water into a plant (or) a root hair cell (or) a seed os :-
(1) Osmosis (2) Imbibition
(3) Absorption (4) Suction

104. Which of the following is imbibant ?
(1) Proteins (2) Pectin
(3) Starch (4) All of the above

105. Which of the following seeds develop a greater imbibition pressure ?
(1) Wheat seed (2) Gram seed
(3) Rice seed (4) Mustard oil seed

106. Swelling in wooden block placed in water is due to
(1) Endosmosis (2) Capillarity
(3) Absorption (4) Imbibition

107. 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

108. To initiate cell plasmolysis , the salt concentration must be :-
(1) Isotonic (2) Hypotonic
(3) Hypertonic (4) Atonic

109. When a plasolysed 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 them

ANSKWER KEY EXERCISE-1

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**1**	**2**	**1**	**1**	**3**	**2**	**1**	**4**	**4**	**2**	**3**	**1**	**2**	**1**	**4**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**4**	**3**	**2**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**1**	**3**	**3**	**1**	**3**
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	**1**	**4**	**1**	**1**	**3**	**1**	**3**	**4**	**1**	**3**	**2**	**4**	**2**	**3**	**1**
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	**4**	**2**	**3**	**4**	**3**	**1**	**2**	**3**	**1**	**1**	**4**	**3**	**1**	**3**	**4**
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	**4**	**2**	**4**	**4**	**3**	**2**	**4**	**3**	**4**	**4**	**4**	**3**	**3**	**3**	**4**
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	**4**	**2**	**1**	**2**	**2**	**1**	**1**	**3**	**3**	**3**	**1**	**1**	**2**	**4**	**1**
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Ans.	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**2**	**4**	**2**
Que.	106	107	108	109											
Ans.	**4**	**3**	**3**	**1**											