ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

path to success

PRE-MEDICAL

BOTANY

ENTHUSIAST | LEADER | ACHIEVER

EXERCISE

Transport in Plants

ENGLISH MEDIUM

EXERCISE-I (Conceptual Questions) — Build Up Your Understanding

INTRODUCTION TO PLANT WATER RELATIONS

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

TP0001

2. Osmosis is the diffusion of a solution of a weaker concentration when both are seperated 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 semipermeable membrane is not specified
(4) The exact concentration of solutions are not indicated

TP0003

3. What statement can be cited for 10% sodium chloride solution and 10% sugar solution present?
(1) Both have equal OP
(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

TP0004

4. If a cell is reduced in size (shrinks) when placing in a solution of sugar, the solution is:-
(1) Hypertonic
(2) Hypotonic
(3) Isotonic
(4) None of the above

TP0005

5. 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

TP0007

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

TP0008

7. Water enters into the root hair from the soil in 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

TP0009

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

TP0011

9. When a plant cell is placed in a hypotonic 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 will decrease
(4) Water potential of the cell sap will increase

TP0012

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

TP0016

11. 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

TP0017

12. Water from the soil enters into the root hairs on account of :-
(1) Turgor pressure
(2) Suction pressure or DPD
(3) Atmospheric pressure
(4) Osmotic pressure

TP0018

13. In a fully turgid cell the values of DPD, OP and TP should be :-
(1) DPD=10 atm, OP =15 atm, TP =5 atm
(2) DPD =5 atm, OP =12 atm, TP =7 atm
(3) DPD =2 atm, OP =7 atm, TP =5 atm
(4) DPD =0 atm, OP =15 atm, TP =15 atm

TP0019

14. 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 TP to higher TP
(3) From higher TP to lower TP
(4) Data insufficient

TP0020

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

TP0021

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

TP0023

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

TP0024

18. Osmotic potential is numerically equal to :-
(1) Turgor pressure (2) Wall pressure
(3) Osmotic pressure (4) DPD

TP0025

19. You are given three cells, a root hair, a cell of the inner cortical layer of root 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

TP0026

20. 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

TP0027

21. The entry of water from the soil up to xylem elements of root is due to :-

(1) Gradient of suction pressure

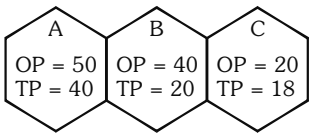
(2) Turgor pressure

(3) Degree of imbibition

(4) Concentration of ions in water

TP0028

22. The three cells A, B & C are joined in a linear manner. Demonstrate the direction of movement of water :-



(1) A → B → C (2) A ←B ←C

(3) A→ B ← C (4) A← B →C

TP0029

23. When the solute has been added in the solution, then which observation can be made ?

(1) The DPD of the solution decreases

(2) The Ψ_W of the solution increases

(3) DPD of the solution decreases while its Ψw increases

(4) DPD of the solution increases while its Ψw decreases

TP0030

24. In a flaccid cell which condition does not occur ?

(1) TP = 0 (2) SP = 0

(3) WP = 0 (4) SP = OP

TP0031

25. 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

TP0033

26. 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) In partially turgid cell

TP0034

27. Select the correct statement -

(1) Pure water has minimum Ψ_W

(2) Pure water has maximum Ψ_W

(3) Pure water has maximum DPD

(4) Pure water has variable Ψ_W & DPD

TP0035

28. 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

TP0036

29. 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) Imbibition

(4) Deplasmolysis

TP0038

30. 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

TP0039

31. 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

TP0040

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

TP0041

33. Water potential is affected by :-
(1) Osmotic potential
(2) Pressure potential
(3) Both (1) and (2)
(4) None of the above

TP0042

34. 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

TP0043

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

TP0044

36. Osmotic potential (ψ_s) of a free solution is:-
(1) Positive (2) Negative
(3) Zero (4) Variable

TP0045

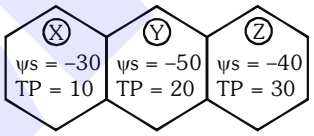
37. The solute potential can be determined in a simple manner by :-
(1) Water potential
(2) DPD
(3) Osmotic pressure
(4) Suction pressure

TP0049

38. The accurate equation for presenting water potential is :-
(1) $\Psi_w = \Psi_s + \Psi_p$
(2) $\Psi_s = \Psi_w + \Psi_p$
(3) $\Psi_w = \Psi_s - \Psi_p$
(4) $\Psi_w = -\Psi_s - \Psi_p$

TP0050

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



(1) X → Y ← Z (2) X → Y → Z
(3) X ← Y ← Z (4) X ← Y → Z

TP0051

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

TP0052

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

TP0056

42. If the OP of any osmotic system is 35 units 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

TP0057

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

TP0058

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

TP0059

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

TP0060

46. 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

TP0062

TRANSPIRATION TO PHLOEM TRANSPORT

47. The pathway of water from soil upto the 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

TP0064

48. Symplast includes all the following except :-
(1) Cytoplasm (2) Cell wall
(3) Cell membrane (4) Plasmodesmata

TP0065

49. In a root 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

TP0066

50. Absorption of water is increased when :-
(1) Transpiration is increased
(2) Photosynthesis is increased
(3) Respiration is increased
(4) Root pressure is increased

TP0067

51. If movement of water occurs through intercellular spaces then it is the :-
(1) Symplast pathway
(2) Either symplast or apoplast pathway
(3) Neither symplast nor apoplast pathway
(4) Apoplast pathway

TP0070

52. Water rises in the stem due to :-
(1) Cohesion and transpiration pull
(2) Turgor pressure
(3) Osmotic pressure
(4) None

TP0071

53. Ascent of sap in woody stem occurs mainly due to:-
(1) Transpiration pull
(2) Capillarity
(3) Molecular adhesion
(4) Photosynthesis

TP0072

54. Dixon and Jolly 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

TP0073

55. 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 the above

TP0074

56. Attractive forces of cell walls for water molecules is termed as :-
(1) Adhesion (2) Cohesion
(3) Osmosis (4) Plasmolysis

TP0075

57. Which tissue are removed when a plant is girdled?
(1) Xylem and pith
(2) Xylem and phloem
(3) Phloem to epidermis
(4) Phloem to pith

TP0076

58. In plants the translocation of organic substances may take place through :-
(1) Epidermis
(2) Only Xylem
(3) Phloem & Xylem
(4) Pith

TP0080

59. The conduction of water from root hair to root xylem is :-
(1) Symplastic
(2) Apoplastic
(3) Osmotic
(4) Symplastic + Apoplastic

TP0081

60. 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_2 in the atmosphere

TP0082

61. 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

TP0083

62. The metal ion involved in the stomatal regulation is:-
(1) Iron (2) Magnesium
(3) Zinc (4) Potassium

TP0084

63. Transpiration from plants would be most rapid when
(1) There is lot of humidity in atmosphere
(2) The air is more humid
(3) There is excess rain fall
(4) Environmental conditions are dry

TP0086

64. Process occur in leaves, which may lower their temperature is :-
(1) Respiration
(2) Photosynthesis
(3) Hydrolysis
(4) Transpiration

TP0087

65. Wilting of a plant is result of excessive :-
(1) Respiration (2) Photosynthesis
(3) Absorption (4) Transpiration

TP0088

66. Conversion of starch to organic acid is essential for
(1) Stomatal closure
(2) Stomatal opening
(3) Lenticel closure
(4) Lenticel opening

TP0090

67. Increase in CO_2 concentration around leaf results in :-
(1) Rapid opening of stomata
(2) Closure of stomata
(3) Closure of hydathodes
(4) No effect on stomatal movement

TP0091

68. Which of the following walls of guard cells is thick ?
(1) Outer (2) Inner
(3) Lateral (4) All the three

TP0092

69. Potometer is used to measure :-
(1) Photosynthesis (2) Growth
(3) Geotropism (4) Transpiration

TP0093

70. The spray of PMA (Phenyl Mercuric Acetate) causes:-
(1) Decrease in transpiration
(2) Increase in transpiration
(3) Increase in absorption
(4) Increase in guttation

TP0095

71. Which of the following is produced during water stress condition ?
(1) Cytokinin
(2) ABA
(3) Phytochrome
(4) ATPase

TP0096

72. Which chemical is used to detect transpiration comparatively from both the surfaces of leaf ?
(1) Calcium carbonate
(2) Cobalt carbonate
(3) Cobalt chloride
(4) Mercuric acetate

TP0097

73. 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

TP0098

74. The most important factor affecting transpiration is:-
(1) Light
(2) Temperature
(3) Wind
(4) Atmospheric humidity

TP0099

75. Shape of guard cells in gramineae family :-
(1) Kidney shaped
(2) Oval
(3) Round
(4) Dumbbell shaped

TP0101

76. With decrease in atmospheric pressure the rate of transpiration will :-
(1) Remain unaffected
(2) Increased
(3) Decrease slowly
(4) Decrease rapidly

TP0102

77. Which one of the following factors 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

TP0103

78. 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) Loss of chloride ions
(4) None of these

TP0105

79. Guard cells are differ from other epidermal cells in having :-
(1) Large vacuoles
(2) Secondary walls
(3) Chloroplast
(4) Mitochondria

TP0107

80. Active $K^+ \rightleftharpoons H^+$ exchange theory explained –
(1) Ascent of sap
(2) phloem conduction
(3) Ion absorption
(4) Stomatal movement

TP0108

81. Stomata of a plant open due to :-
(1) Influx of potassium ions
(2) Efflux of potassium ions
(3) Influx of hydrogen ions
(4) Influx of calcium ions

TP0110

82. Due to increasing temperature, transpiration :-
(1) Increases
(2) Decreases
(3) First increases then decreases
(4) Unaffected

TP0111

83. If temperature remains constant then with increasing alttitude, the transpiration will :-
(1) Increases
(2) Decreases
(3) First decreases then increases
(4) Unaffected

TP0112

84. 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

TP0113

85. Due to more wind velocity, the transpiration rate will be:-
(1) Less
(2) More
(3) Unaffected
(4) First increases then decreases

TP0114

86. Foliar transpiration :-
(1) Includes both stomatal and cuticular transpiration
(2) Includes lenticular transpiration only
(3) Includes all type of transpiration
(4) Includes stomatal transpiration only

TP0115

87. The process of the loss of liquid from the tip of uninjured leaf is called :-
(1) Evaporation
(2) Transpiration
(3) Guttation
(4) Exudation

TP0117

88. Guttation :-
(1) Takes place during night when root pressure is positive
(2) Takes place during night when root pressure is negative
(3) Always take place
(4) Takes place during night when transpiration is high

TP0118

89. The hydathodes are related with :-
(1) Transpiration
(2) Guttation
(3) Bleeding/Exudation
(4) All

TP0119

90. Root pressure can be measured by which instrument?

(1) Potometer (2) Auxanometer

(3) Manometer (4) Barometer

TP0120

91. 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

TP0122

92. Hydathodes :-

(1) open during night hours

(2) open during day hours

(3) open during noon hours

(4) remain always open

TP0123

93. Water of guttation is :–

(1) Pure water

(2) Water with dissolved salts

(3) Solution of organic food

(4) Condensed water vapour

TP0124

94. Cells present below hydathodes are –

(1) Complementary cells

(2) Epithem cells

(3) Guard cells

(4) Kranz cells

TP0125

95. The process by which toddy is obtained, is:-

(1) Guttation

(2) Transpiration

(3) Bleeding/Exudation

(4) All

TP0126

EXERCISE-I (Conceptual Questions) ANSWER KEY

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

EXERCISE-II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

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

(1) Mass flow involving a carrier and ATP

(2) Cytoplasmic streaming

(3) Root pressure and transpiration pull

(4) P-proteins

TP0128

AIPMT 2007

2. Two cells A and B are contiguous. Cell A has osmotic pressure 10 atm, turgor pressure 7 atm and diffusion pressure deficit 3 atm. Cell B has osmotic pressure 8 atm, turgor pressure 3 atm and diffusion pressure deficit 5 atm. The result will be :-

(1) Equilibrium betwee the two

(2) Movement of water from cell A to B

(3) Movement of water from cell B to A

(4) No movement of water

TP0129

AIPMT 2008

3. Carbohydrates are commonly found as starch in plant storage organs. Which of the following five properties of starch (a–e) make it useful as a storage material ?

(a) Easily translocated

(b) Chemically non-reactive

(c) Easily digested by animals

(d) Osmotically inactive

(e) Synthesized during photosynthesis

The useful properties are :-

(1) (a), (c) and (e)

(2) (a) and (e)

(3) (b) and (c)

(4) (b) and (d)

TP0130

AIPMT 2009

4. Guard cells help in :-

(1) Transpiration

(2) Guttation

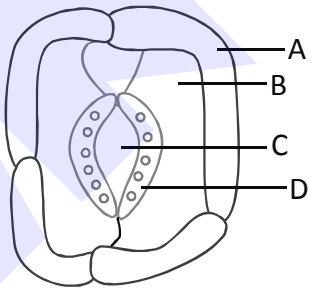
(3) Fighting against infection

(4) Protection against grazing

TP0131

AIPMT-Mains 2010

5. Given below is the diagram of a stomatal apparatus. In which of the following all the four parts labelled as A, B, C and D are correctly identified ?



	A	B	C	D
(1)	Guard cell	Stomatal aperture	Subsidiary cell	Epidermal cell
(2)	Epidermal cell	Guard Cell	Stomatal aperture	Subsidiary cell
(3)	Epidermal cell	Subsidiary cell	Stomatal aperture	Guard cell
(4)	Subsidiary cell	Epidermal cell	Guard cell	Stomatal aperture

TP0132

AIPMT-Pre 2011

6. In land plants, the guard cells differ from other epidermal cells in having :-

(1) Cytoskeleton

(2) Mitochondria

(3) Endoplasmic reticulum

(4) Chloroplasts

TP0133

AIPMT-Mains 2011

7. Guttation is the result of :
(1) Root pressure
(2) Diffusion
(3) Transpiration
(4) Osmosis

TP0134

8. Function of companion cells is :
(1) Loading of sucrose into sieve elements.
(2) Providing energy to sieve elements for active transport.
(3) Providing water to phloem
(4) Loading of sucrose into sieve elements by passive transport.

TP0135

NEET-UG 2013

9. Which of the following criteria **does not** pertain to facillitated transport ?
(1) Uphill transport
(2) Requirement of special membrane proteins
(3) High selectivity
(4) Transport saturation

TP0136

AIPMT 2014

10. The osmotic expansion of a cell kept in water is chiefly regulated by :
(1) Mitochondria (2) Vacuoles
(3) Plastids (4) Ribosomes

TP0137

AIPMT 2015

11. In a ring girdled plant:
(1) The root dies first
(2) The shoot and root die together
(3) Neither root nor shoot will die
(4) The shoot dies first

TP0138

12. Transpiration and root pressure cause water to rise in plants by :
(1) Pulling and pushing it, respectively
(2) Pushing it upward
(3) Pushing and pulling it, respectively
(4) Pushing it upward

TP0139

Re-AIPMT 2015

13. Root pressure develops due to :
(1) Increase in transpiration
(2) Active absorption
(3) Low osmotic potential in soil
(4) Passive absorption

TP0140

14. A column of water within xylem vessels of tall trees does **not** break under its weight because of :
(1) Positive root pressure
(2) Dissolved sugars in water
(3) Tensile strength of water
(4) Lignification of xylem vessels

TP0141

NEET-I 2016

15. Water vapour comes out from the plant leaf through the stomatal opening. Through the same stomatal opening carbon dioxide diffuses into the plant during photosynthesis. Reason out the above statements using one of following option :-
(1) Both processes cannot happen simultaneously.
(2) Both processes can happen together because the diffusion coefficient of water and CO_2 is different.
(3) The above processes happen only during night time.
(4) One process occurs during day time, and the other at night.

TP0142

16. Specialised epidermal cells surrounding the guard cells are called :-
(1) Complementary cells
(2) Subsidiary cells
(3) Bulliform cells
(4) Lenticels

TP0143

NEET-II 2016

17. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap ?
(1) Low refractive index
(2) Absence of sugar
(3) Acidic
(4) Alkaline

TP0144

NEET(UG) 2017

18. Which of the following facilitates opening of stomatal aperture ?
(1) Decrease in turgidity of guard cells
(2) Radial orientation of cellulose microfibrils in the cell wall of guard cells
(3) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
(4) Contraction of outer wall of guard cells

TP0145

19. The water potential of pure water is :
(1) Less than zero
(2) More than zero but less than one
(3) More than one
(4) Zero

TP0146

NEET(UG) 2018

20. Stomatal movement is not affected by :-
(1) Temperature (2) Light
(3) O_2 concentration (4) CO_2 concentration

TP0147

NEET(UG) 2019

21. Xylem translocates :-
(1) Water only
(2) Water and mineral salts only
(3) Water, mineral salts and some organic nitrogen only
(4) Water, mineral salts, some organic nitrogen and hormones

TP0222

22. What is the direction of movement of sugars in phloem?
(1) Non-multidirectional
(2) Upward
(3) Downward
(4) Bi-directional

TP0223

NEET(UG) 2019 (Odisha)

23. The main difference between active and passive transport across cell membrane is :-
(1) Passive transport is non-selective whereas active transport is selective
(2) Passive transport requires a concentration gradient across a biological membrane whereas active transport requires energy to move solutes
(3) Passive transport is confined to anionic carrier proteins whereas active transport is confined to cationic channel proteins
(4) Active transport occurs more rapidly than passive transport

TP0224

24. Which of the following is not a feature of active transport of solutes in plants ?
(1) Occurs against concentration gradient
(2) Non-selective
(3) Occurs through membranes
(4) Requires ATP

TP0225

25. What will be the direction of flow of water when a plant cell is placed in a hypotonic solution ?
(1) Water will flow in both directions
(2) Water will flow out of the cell
(3) Water will flow into the cell
(4) No flow of water in any direction

TP0226

NEET(UG) 2020

26. The process reponsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is :

(1) Plasmolysis (2) Transpiration

(3) Root pressure (4) Imbibition

TP0227

NEET(UG) 2020 (COVID-19)

27. Select the **incorrect** statement.

(1) Transport of molecules in phloem can be bidirectional.

(2) Movement of minerals in xylem is unidirectional.

(3) Unloading of sucrose at sink does not involve the utilization of ATP.

(4) Elements most easily mobilized in plants from one region to another are: phosphorus, sulphur, nitrogen and potassium.

TP0228

NEET(UG) 2021

28. Match **List - I** with **List - II.**

List -I		List - II	
(a)	Cohesion	(i)	More attraction in liquid phase
(b)	Adhesion	(ii)	Mutual attraction among water molecules
(c)	Surface tension	(iii)	Water loss in liquid phase
(d)	Guttation	(iv)	Attraction towards polar surfaces

Choose the **correct** answer from the options given below.

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(iv)	(i)	(iii)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(iii)	(i)	(iv)	(ii)
(4)	(ii)	(i)	(iv)	(iii)

TP0229

NEET(UG) 2021 (Paper-2)

29. Transport of water and mineral in higher plants takes place through

(1) Sieve elements

(2) Companion cells

(3) Tracheids

(4) Transfusion tissue

TP0258

NEET(UG) 2022

30. "Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which:

(1) food is transported

(2) for both water and food transportation

(3) osmosis is observed

(4) water is transported

TP0259

31. Which of the following is **not** observed during apoplastic pathway ?

(1) The movement does not involve crossing of cell membrane

(2) The movement is aided by cytoplasmic streaming

(3) Apoplastic is continuous and does not provide any barrier to water movement

(4) Movement of water occurs through intercellular spaces and wall of the cells.

TP0260

32. Addition of more solutes in a given solution will :

(1) lower its water potential

(2) make its water potential zero

(3) not affect the water potential at all

(4) raise its water potential

TP0261

NEET(UG) 2022 (OVERSEAS)

33. Which of the following statements about facilitated diffusion is **incorrect**?
(1) Porins are involved in this process.
(2) Movement of molecule occurs against the concentration gradient.
(3) ATP is not required for this process,
(4) Special proteins of the membrane help in this process.

TP0262

34. Which of the following physical properties of water is/are responsible for providing water, the high tensile strength and high capillarity during ascent of sap in the plants?
(1) Cohesion, adhesion and surface tension
(2) Cohesion only
(3) Adhesion and cohesion
(4) Surface tension and cohesion

TP0263

35. Phloem sap in the plants mainly consists of:
(1) fructose and sucrose
(2) glucose and water
(3) sucrose and water
(4) fructose and water

TP0264

Re-NEET(UG) 2022

36. When a carrier protein facilitates the movement of two molecules across the membrane in same direction, it is called :
(1) Uniport (2) Transport
(3) Antiport (4) Symport

TP0265

37. The ascent of xylem sap in plants is mainly accomplished by the :
(1) size of the stomatal aperture
(2) distribution of stomata on the upper and lower epidermis
(3) cohesion and adhesion between water molecules
(4) root pressure

TP0266

38. Which type of substance would face difficulty to pass through the cell membrane?
(1) Substance with hydrophobic moiety
(2) Substance with hydrophilic moiety
(3) All substance irrespective of hydrophobic and hydrophilic moiety
(4) Substance soluble in lipids

TP0267

EXERCISE-II (Previous Year Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**1**	**2**	**4**	**1**	**3**	**4**	**1**	**1**	**1**	**2**	**1**	**1**	**2**	**3**	**2**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**2**	**4**	**2**	**4**	**3**	**4**	**4**	**2**	**2**	**3**	**3**	**3**	**1**	**3**	**1**
Que.	31	32	33	34	35	36	37	38							
Ans.	**2**	**1**	**2**	**1**	**3**	**4**	**3**	**2**							

EXERCISE-III(A) NCERT BASED QUESTIONS

1. Which of the following is not dependent on a living system?
(1) Diffusion
(2) Facilitated diffusion
(3) Both 1 and 2
(4) None of the above

TP0149

2. If the external solution balances the osmotic pressure of the cytoplasm, the solution is said to be :-
(1) Hypotonic (2) Hypertonic
(3) Isotonic (4) None of the above

TP0150

3. Water molecules are unable to penetrate the endodermis as it is impermeable to water because of a caspanian strip which is made up of :-
(1) Chitin (2) Cellulose
(3) Lignin (4) Suberin

TP0151

4. The seeds of which plant cannot germinate and establish without the presence of mycorrhizae
(1) *Cycas* (2) *Selaginella*
(3) *Pinus* (4) All of these

TP0152

5. How much of water reaching the leaves is used in photosynthesis and plant growth –
(1) Less than 5 percent
(2) Less than 1 percent
(3) Less than 10 percent
(4) Less than 4 percent

TP0153

6. For a solution at atmospheric pressure :
(1) $\psi_w = \psi_s$ (2) $\psi_w = 0$
(3) $\psi_s = 0$ (4) None of above

TP0154

7. The net direction and rate of osmosis depends on:
(1) Pressure gradient
(2) Concentration gradient
(3) Both (1) and (2)
(4) Equilibrium

TP0155

8. Which part in roots has transport proteins that are control points, where a plant adjuste the quantity & types of solutes that reach the xylem:
(1) Cortical cells (2) Endodermal cells
(3) Epidermal cells (4) Root hairs

TP0156

9. The immediate cause of the opening and closing of stomata is :-
(1) Change in turgidity of guard cells
(2) Flaccidity of guard cell
(3) Orientation of microfibrills
(4) Turgidity of subsidiary cells

TP0157

10. Facilitated diffusion can not cause net transport of molecules from a low to a high concentration because :-
(1) This would require output of energy
(2) This would require input of energy
(3) Both (1) and (2)
(4) None of these

TP0158

11. Over small distances substances move by :-
(1) diffusion
(2) cytoplasmic streaming
(3) Mass flow
(4) both (1) and (2)

TP0159

12. Pumps are not associated with :-
(1) Uphill transport
(2) Transport from low concentration to high concentration
(3) Direct or indirect ATP consumption
(4) Non selective nature

TP0160

13. Root pressure is responsible for :-
(1) transpiration and guttation
(2) exudation and imbibition
(3) exudation and guttation
(4) transpiration and imbibition

TP0161

14. Xylem is not associated with translocation of :-
(1) Water (2) Minerals
(3) Organic nitrogen (4) Photosynthates

TP0162

15. Cohesion, adhesion & surface tension physical properties of water, provide which of the following properties (Characteristics) in water column ?
(1) Transpiration pull & Tensile strength
(2) Tensile strength and capillarity
(3) Capillarity & transpiration pull
(4) All the above

TP0163

16. Diffusion is a slow process and is not dependent on :-
(1) concentration gradient
(2) membrane permeability
(3) a living system
(4) temperature and pressure

TP0164

17. At atmospheric pressure a solution has ψ_S = –10, what is the value of water potential for this solution?
(1) Can't be calculated without ψ_P
(2) Water potential = –10
(3) Water potential of solution at atmospheric pressure always taken to be zero
(4) Water potential = 10

TP0165

18. If we place a twig, bearing white flowers in coloured water, it turn colour, on examining the T.S. of the twig, what would we can demonstrate?
(1) Flowers have ability to turn their colour
(2) Osmosis of the coloured water
(3) After cutting, twig shows more affinity for water
(4) Path of water movement is through the vascular bundles

TP0166

19. Which of the following is correct regarding apoplast pathway of water?
(1) Movement of water occurs through the intercellular spaces and the walls of the cells
(2) Movement of water is dependent on the gradient
(3) Water movement is through mass flow
(4) All of the above

TP0167

20. The physical properties of water like cohesion, adhesion and surface tension give water which of the following ability that help in ascent of xylem sap?
(1) Ability to rise in thin tubes
(2) Ability to resist a pulling force
(3) Both (1) and (2)
(4) High viscous nature

TP0168

21. Which of following is correct statement ?
(1) Facilitated transport and active transport both are sensitive to inhibitors
(2) Facilitated transport and simple diffusion both do not requires ATP energy
(3) Both facilitated transport and active transport are highly selective
(4) All the above

TP0169

22. The greater the concentration of water in a system the greater is it's kinetic energy or water potential which of following is correct about water potential?

(1) Water potential of pure water is 0 and it is its minimum value.

(2) Water potential of solution is always positive.

(3) If pressure greater than atmospheric pressure is applied to pure water or solution then its water potential increases

(4) All the above

TP0170

23. Osmosis is the term used to refer specifically to the diffusion of water across a differentially or semipermeable membrane. Which is not correct about it?

(1) Osmosis is the movement of solvent from their high concentration to low concentration through semipermeable membrane.

(2) Osmosis is the movement of solution from their low concentration to high concentration through semipermeable membrane.

(3) Osmosis is the movement of solvent from higher ψ_w to lower ψ_w through semipermeable membrane.

(4) Osmosis is the movement of solvent from high solute potential to low solute potential through semipermeable membrane.

TP0171

24. Which of the following statements is **not correct**?

(1) Most accepted mechanism for water movement up a plant is cohesion-tension- transpiration pull model

(2) Root pressure play a major role in water movement up tall trees because it provide a strong push in the overall process of water transport

(3) The flow of water upward through the xylem in plants achieve fairly high rate upto 15 metres per hour

(4) Effect of root pressure can be observed during the process of exudation and guttation

TP0192

25. Which of the following is **not correct** ?

(1) A plant cell show plasmolysis when it is placed in a solution which has lower water potential as compare to the protoplasm of cell

(2) Imbibition is active transport of water since water movement in imbibition is against the water potential gradient

(3) Water potential gradient and affinity between the solid and liquid is must for imbibition

(4) The pressure exerted by protoplast against the cell wall is responsible for enlargement of cells

TP0181

26. Root pressure is a :-
(1) Negative pressure
(2) Positive pressure
(3) Positive as well as negative depends upon external humidity level
(4) Equal to atmospheric pressure

TP0190

27. Which of the following factors **does not** affect the rate of simple diffusion ?
(1) The permeability of the membrane
(2) The number of transport proteins in the membrane
(3) The gradient of concentration
(4) Temperature and pressure

TP0191

28. Over small distance, substances can move by :
(1) Diffusion
(2) Cytoplasmic streaming
(3) Active transport
(4) All of the above

TP0230

29. Substances that have a..... moiety, find it difficult to pass through the membrane.
(1) Hydrophilic (2) Hydrophobic
(3) Neutral (4) Lipophilic

TP0231

30. Transport methods those require special membrane proteins also show :
(1) Always uphill movement
(2) Always movement along the concentration gradient
(3) Always transport saturation
(4) Always ATP expenditure

TP0232

31. Which of the following statements are correct?
(A) If two systems containing water are in contact, random movement of water molecules will result in net movement of water down a gradient of free energy is called diffusion.
(B) The less the solute molecules in a solution, the lower is the solute potential
(C) If a pressure greater than atmospheric pressure is applied to a solution, its water potential increases.
(D) By convention, the water potential of pure water at standard temperature which is not under any pressure, is taken to be zero i.e. minimum value of water potential.
(1) A and B (2) A and C
(3) B and D (4) C and D

TP0233

32. Imbibition :
(1) is a special type of osmosis
(2) involves adsorbtion
(3) is the characteristic feature of lipophilic colloids
(4) Occurs against the water potential gradient

TP0234

33. All the following statements are correct except that :
(1) The symplastic movement of absorbed water may be aided by cytoplasmic streaming
(2) The xylem vessels and tracheids are non living conduits so are parts of the apoplast
(3) The movement through the apoplast does not involve crossing the cell membrane
(4) The apoplastic system is the system of interconnected protoplasts that is continuous through the plant, except at the casparian strips of the endodermis in the roots.

TP0235

34. As various ions from the soil are actively transported into the vascular tissues of the roots, water follows and increases the pressure inside the xylem this pressure :
(1) is responsible for water loss from leaves in liquid phase
(2) may re-establish the continuity of water column in xylem
(3) is considered as positive pressure
(4) All of the above

TP0236

35. Most of the nitrogen in plants is transported in :
(1) Organic form via phloem
(2) Organic form via xylem
(3) Inorganic form via phloem
(4) Inorganic form via xylem

TP0237

36. In plants the accepted mechanism for the translocation of sugars from source to sink:
(1) involves the modest push by root pressure
(2) involves the transport according to pressure potential gradient
(3) is completely based upon transpiration pull
(4) Does not requires metabolic energy

TP0238

37. Mineral translocation in plants is carried out by :
(1) Xylem exclusively
(2) Phloem exclusively
(3) Mainly xylem & little bit by phloem
(4) Mainly phloem & little bit by xylem

TP0239

38. Diffusion is very important to plants since it is the only means for :
(1) Water translocation in root
(2) Gaseous movement within plant
(3) Mineral translocation in root
(4) Sugar transport from source to sink

TP0240

39. Which of the following is not a similarity between facilitated diffusion and active transport ?
(1) Transport saturation
(2) Sensitivity towards protein inhibitors
(3) Selectivity
(4) Uphill transport

TP0241

40. Water will move from it's region of :
(1) lower ψ_p to higher ψ_p
(2) lower ψ_s to higher ψ_s
(3) lower ψ_w to higher ψ_w
(4) higher ψ_w to lower ψ_w

TP0242

41. Which of the following is ultimately responsible for enlargement of plant cells ?
(1) Osmotic pressure
(2) Turgor pressure
(3) Wall pressure
(4) Osmotic potential

TP0243

42. Beside water potential gradient, which of the following is also pre requisite for imbibition ?
(1) Permeable membrane
(2) Impermeable membrane
(3) Affinity between adsorbent & liquid
(4) Selectively permeable membrane

TP0244

43. Select the incorrect statement with respect to mycorrhiza :

(1) They have large surface area

(2) The fungus provides minerals & water

(3) Roots provide nitrogenous compounds

(4) It can never be of obligate nature

TP0245

44. Which of the following is not observed during stomatal opening ?

(1) High turgidity of guard cells

(2) Radially oriented microfibrils

(3) Outer wall bulge out

(4) Low turgor of guard cells

TP0246

45. Which of the following is not a significance of transpiration ?

(1) Absorption of water

(2) Absorption of minerals

(3) Cooling of leaf surface

(4) Maintain the shape and structure of plant

TP0247

46. In the given schematic diagram, pathway of water movement inside the root is shown from soil to xylem. Identify the tissue involved in the step A and B and choose the correct option:-

Epidermis → A → Endodermis → B → Xylem

	A	B
(1)	Hypodermis	Pericycle
(2)	Pericycle	Hypodermis
(3)	Pericycle	Cortex
(4)	Cortex	Pericycle

TP0248

47. Ringing/girdling experiment demonstrate that :-

(1) Phloem is responsible for translocation of food

(2) Xylem is responsible for translocation of food

(3) Mineral absorption in plants is an active process

(4) Mineral absorption in plants is a passive process

TP0249

48. Choose the **correct** statement :-

(1) Pressure can build up in a plant cell when water enters a plant cell due to diffusion causing a pressure build up against the cell wall, which makes the cell turgid and it results in increase of osmotic pressure

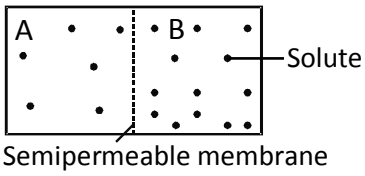
(2) Osmotic pressure is the negative pressure applied while osmotic potential is positive

(3) Pressure potential always positive in a plant body

(4) Diffusion is a slow process, It can account for only short distance movement of molecules

TP0250

49.



Choose the correct option with respect to given diagram :-

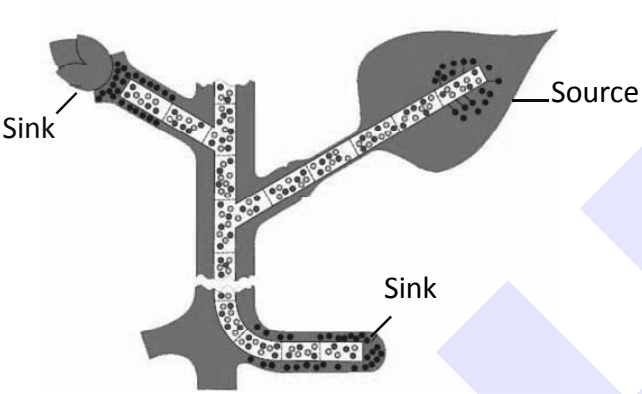
	Ψw	Ψs
(1)	High in A	High in B
(2)	High in A	Low in B
(3)	Low in A	Low in B
(4)	Low in A	High in B

TP0251

50. (A) Water molecules have a mutual attraction.
(B) Polar surfaces have attraction for water molecules.
(C) Less attraction of water molecules to each other in liquid phase as compare to water in gas phase.
Which of the above given properties help ascent of xylem sap?
(1) A and C (2) A and B
(3) B and C (4) A only

TP0252

51. Choose the correct option regarding type of transport shown in given figure :-

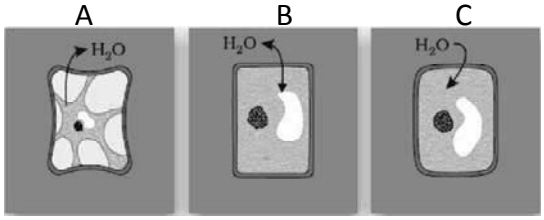


Options :-

	Transported material	Transport tissue
(1)	Food only	Phloem
(2)	Food + water only	Xylem
(3)	Food + PGR only	Xylem
(4)	Food + PGR + amino acids	Phloem

TP0253

52.



(i) ψ_W of cell 'B' will be increasing
(ii) Cell 'B' is flaccid.
(iii) ψ_W of cell 'A' is minimum
(iv) ψ_P of cell 'C' would be zero.
Which of the above statements are correct with respect to given diagram ?
(1) Only (ii) (2) (ii) and (iii)
(3) (i), (ii), (iii) and (iv) (4) (i), (iii) and (iv)

TP0254

53. Requires special membrane proteins, highly selective, transport saturates, uphill transport, requires ATP energy.
How many properties from above are **not** related to facilitated diffusion ?
(1) 1 (2) 2 (3) 3 (4) 4

TP0255

54. Match column I with column-II & select the option with correct match :-

	Column-I		Column-II
A.	Guttation	I.	Active transport
B.	Guard cell	II.	Water + mineral + organic nitrogen + hormone
C.	Xylem sap	III.	Root pressure
D.	Pump protein	IV.	Inner wall thick and elastic

Options :-
(1) A-III, B-IV, C-I, D-II
(2) A-III, B-II, C-IV, D-I
(3) A-I, B-IV, C-II, D-III
(4) A-III, B-IV, C-II, D-I

TP0256

55. Which of the following statements about transport in plant are **correct** ?
A. Source - sink relationship is variable for phloem.
B. Transport in phloem can be bidirectional.
C. Phloem sap may contains some hormones.
D. Transport in xylem is always unidirectional.
Options :
(1) A, B & C only (2) A, C & D only
(3) B, C & D only (4) A, B, C & D

TP0257

EXERCISE-III(B) ANALYTICAL QUESTIONS

56. If a plant cell is immersed in water, the water continues to enter the cell until the :-

(1) Amount of the salts is the same inside the cell as outside

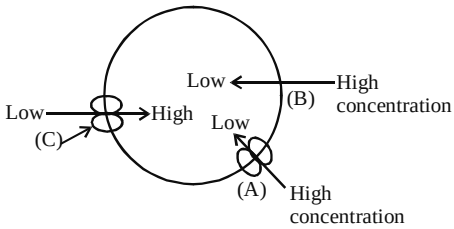
(2) Cell bursts

(3) Amount of water is the same inside the cell as out side

(4) Diffusion pressure deficit is the same inside the cell as out side

TP0174

57.



Choose the **correct** answer :-

(1) A – Lipid membrane
B – Channel protein
C – Pump protein

(2) A – Pump protein
B – Channel protein
C – Lipid membrane

(3) A – Pump protein
B – Lipid membrane
C – Channel protein

(4) A – Channel protein
B – Lipid membrane
C – Pump protein

TP0175

58. If the given solution is of 25% concentration; then what cannot be presented for this :-

(1) OP (2) DPD

(3) Solute potential (4) TP

TP0176

59. 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) Synthesis of chlorophyll increases

(3) No effect

(4) Wilting of plants

TP0177

60. 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

TP0178

61. Which of the following seeds develop a greater imbibition pressure ?

(1) Wheat seed (2) Gram seed

(3) Rice seed (4) Mustard oil seed

TP0179

62. If some solute is dissolved in pure H_2O, then solution has fewer free H_2O and concentration of H_2O decreases, increasing its :-

(1) Osmotic pressure

(2) Solute concentration

(3) DPD

(4) All of the above

TP0180

63. If OP = TP then cell will be :-
(1) Flaccid (2) Turgid
(3) Fully turgid (4) Plasmolysed

TP0183

64. What will be the effects on open stomata, if relative humidity is 100% in atmosphere?
(1) Completely open (2) Partially open
(3) May close or open (4) Closed

TP0184

65. Transpiration is completely absent in :-
(1) Xerophytes
(2) Mesophytes
(3) Submerged hydrophytes
(4) Succulents at night

TP0185

66. Significance of transpiration lies in :-
(1) Transport of water
(2) Absorption and distribution of water
(3) Regulating the temperature of the plant body
(4) All of the above

TP0186

67. In the mechanism of opening of stomata, the important factor is :-
(1) Turgidity 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

TP0187

68. Which of the following statement is not true ?
(1) Per unit area 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 becomes leathery or hairy

TP0188

69. Wilting in plant occurs when :-
(1) Xylem is blocked
(2) Epidermis is peeled off
(3) Pith is removed
(4) Phloem is blocked

TP0189

70. Which of the following is not correct about DPD?
(1) It is the decrease of diffusion pressure
(2) Maximum value of DPD is equal to OP
(3) DPD of pure H_2O is zero
(4) Increase in TP of a cell decreases DPD

TP0173

EXERCISE-III ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**1**	**3**	**4**	**3**	**2**	**1**	**3**	**2**	**1**	**2**	**4**	**4**	**3**	**4**	**2**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**3**	**2**	**4**	**4**	**3**	**4**	**3**	**2**	**2**	**2**	**2**	**2**	**4**	**1**	**3**
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	**2**	**2**	**4**	**4**	**2**	**2**	**3**	**2**	**4**	**4**	**2**	**3**	**4**	**4**	**2**
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	**4**	**1**	**4**	**2**	**2**	**4**	**2**	**2**	**4**	**4**	**4**	**4**	**4**	**4**	**3**
Que.	61	62	63	64	65	66	67	68	69	70					
Ans.	**2**	**4**	**3**	**1**	**3**	**4**	**1**	**2**	**1**	**2**					