

Unit 8: Plant Physiology

Multiple Choice Questions

MULTIPLE CHOICE QUESTIONS (EXERCISE)

- Process by which water evaporates from surface of leaf primarily through stomata.**
(a) Transpiration (b) Guttation
(c) Imbibition (d) Cohesion
- Through which structure does most of transpiration occurs?**
(a) Root hairs (b) Phloem
(c) Xylem (d) Stomata
- The TACT theory primarily explains?**
(a) The movement of nutrients in the plants
(b) The transport of water in plants
(c) The absorption of minerals
(d) The process of photosynthesis
- Which of the following is not a function of xylem?**
(a) Transport of water
(b) Transport of minerals
(c) Transport of food
(d) Mechanical support
- Which of the following has a perforated cell wall?**
(a) Vessel (b) Fibre
(c) Tracheid (d) Sclereid
- Exposure to lower temperature stimulates the process of flowering in biennial or perennial plants:**
(a) Dormancy (b) Photoperiodism
(c) Vernalization (d) All of above
- Plants that are adapted to survive in dry conditions:**
(a) Xerophytes (b) Hydrophytes
(c) Mesophytes (d) Halophytes
- When sugar content in a cell increases the concentration of solute increases, what happens to the water potential?**
(a) Raises (b) Drops
(c) Unchanged (d) None of these

9. In higher plant, transport of food materials occurs through;
(a) Companion cells
(b) Sieve tubes
(c) Vessel elements
(d) Tracheids
10. The plant hormone which inhibits the stem and root growth is
(a) Auxin
(b) Ethylene
(c) Cytokinins
(d) Gibberellin
11. The leaves of some hydrophytes float on the surface of water. In such a leaf, stomata are found in:
(a) Lower epidermis
(b) Upper epidermis
(c) Sides of leaf
(d) Deep depressions in leaf
12. Mesophytes are adapted to survive in:
(a) Moderate environments
(b) Dry conditions
(c) Water environments
(d) All of above

SLO BASED MULTIPLE CHOICE QUESTIONS

Nutrition in Plants

13. Which of the following does not serve as a source of energy?
(a) Water (b) Lipids
(c) Proteins (d) Carbohydrates
14. The collective processes involved in the intake and utilization of nutrients for growth, repair and maintenance of activities in an organism is called:
(a) Excretion (b) Nutrition
(c) Reproduction (d) Digestion
15. The number of macronutrients in plants are:
(a) 3 (b) 6
(c) 9 (d) 12
16. Which nutrient is a part of ATP and plays role in promoting root growth and favours flowering in the aerial zone, is:
(a) Calcium (b) Magnesium
(c) Phosphorous (d) Sulfur
17. Deficiency of which nutrient leads to delayed flowering, browning and wrinkling of the leaves?
(a) Iron (b) Phosphorus
(c) Calcium (d) Magnesium
18. Dark patches are formed on the leaves due to the deficiency of:
(a) Manganese (b) Sulfur
(c) Potassium (d) Nitrogen
19. Which of the following statements describe the deficiency of calcium in plants:
(a) Dark patches on leaves
(b) Plant becomes lighter in color
(c) Browning and wrinkling of leaves
(d) Development of yellow and brown patches
20. The micronutrient which is critical for nitrogen fixation, nitrogen reduction, sulfur metabolism and iron utilization is:
(a) Manganese (b) Zinc
(c) Copper (d) Molybdenum
21. Which of the following truly describes copper as a nutrient?
(a) Necessary for lignin synthesis
(b) Act as cofactor for enzymes
(c) Its deficiency can result in chlorosis twisted leaves and stunted growth
(d) All of the above
22. Leaves modified into a sac, partly filled with water, numerous stiff hairs, belongs to:
(a) Pitcher plant (b) Venus-fly trap
(c) Sundew (d) Cobra lilly

23. Venous fly trap has:

- (a) Trap consisting two lobes having hinge
- (b) Inner surfaces contain trichomes
- (c) Fine, interlocking bristles
- (d) All of above

24. Which plant uses odour as a chemical weapon to attracts its prey?

- (a) Sundew
- (b) Cobra lilly
- (c) Pitcher plant
- (d) Rose

Gas Exchange in Plants**25. Who proposed that guard cells in leaf epidermis are solely responsible for photosynthesis?**

- (a) H. Van Mohl
- (b) Dixon
- (c) F. Sanger
- (d) Van Neil

26. Which light enhances the process of opening of stomata by acidifying the surrounding environment, promoting K^+ uptake is:

- (a) Red light
- (b) Green light
- (c) White light
- (d) Blue light

27. The hormone which over rides the effects of light and CO_2 concentration in stomatal movement is:

- (a) Auxins
- (b) Cytokinins
- (c) Abscissic acid
- (d) Gibberellins

Support in Plants**28. The membrane of _____ is called tonoplast.**

- (a) Vacuole
- (b) Nucleus
- (c) Lysosome
- (d) ER

29. The cells that are grouped in the form of strands and cylinders, lack secondary cell walls:

- (a) Parenchyma
- (b) Sclerenchyma
- (c) Collenchyma
- (d) Both (a) and (b)

30. Which of the following correctly describes the sclerenchyma tissue:

- (a) Provides support to herbaceous plants
- (b) Primary walls thickened at corners
- (c) Thick secondary cell walls, saturated with lignin
- (d) Both (a) and (b)

31. Which of the following does not belongs to sclerenchyma cells?

- (a) Fibres
- (b) Sclereid
- (c) Vessels
- (d) Parenchyma

Water Potential**32. Water potential is symbolized by Greek Letter psi=**

- (a) ψ_w
- (b) ψ_v
- (c) ψ_a
- (d) ψ_p

33. Pure water has maximum water potential which by definition is:

- (a) +1
- (b) 0
- (c) +1200kpa
- (d) -600kpa

34. Osmotic potential is also called:

- (a) Water potential
- (b) Solute potential
- (c) Pressure potential
- (d) Action potential

Transport of Water**35. The steeper the potential gradient the flow of water will be:**

- (a) Faster
- (b) Slower
- (c) Un/not affected
- (d) Very slower

36. Which of the following cells are the extensions of epidermal cells?

- (a) Tap roots
- (b) Lateral roots
- (c) Root hairs
- (d) Adventitious roots

37. The pathway involving a system of adjacent cell-walls in plant roots for the transport of sap is called:

- (a) Apoplast
- (b) Symplast
- (c) Vacuolar
- (d) ETC

38. The cytoplasmic strands that extend through pores in adjacent cell walls of plants are:

- (a) Plasmodesmata
- (b) Stomata
- (c) Lenticels
- (d) All of the above

39. The pathway in which water and minerals move via interconnected protoplasts of root cells, is called:
 (a) Apoplast (b) Symplast
 (c) Vacuolar (d) Reticular
40. Casparian strips are hurdle in the way of:
 (a) Vacuolar pathway
 (b) Symplast pathway
 (c) Apoplast pathway
 (d) None of above
41. Which cells does not comprise xylem tissue?
 (a) Sieve elements (b) Xylem fibres
 (c) Tracheids (d) Vessels
42. Which feature belongs to vessels of xylem:
 (a) Elongate and thin cells
 (b) Living cells with thin walls, hold nutrients
 (c) Shorter, broader, perforation plates
 (d) All of above
43. The force which plays crucial role in maintaining continuity of water column during ascent of sap is:
 (a) Adhesion (b) Cohesion
 (c) Tension (d) Ionic bond
44. Water molecules within xylem stick together forming an unbroken column from roots to the leaves is due to:
 (a) Adhesion (b) Cohesion
 (c) Tension (d) Transduction
- Translocation of Food**
45. Which statement characterizes tension in TACT theory.
 (a) Negative pressure created by pulling force for continuous flow of water
 (b) Attractive force between water and xylem walls
 (c) Attractive force between water molecules
 (d) Both (a) and (c)
46. Phloem tissue compromises of:
 (a) Companion cells
 (b) Sieve elements
 (c) Phloem fibres
 (d) All of above
47. The cells of phloem that transport sugars throughout the plant are:
 (a) Companion cells
 (b) Fibres
 (c) Phloem parenchyma
 (d) Sieve tube cells
48. Companion cells supply _____ to sieve tube elements.
 (a) ATP and proteins
 (b) Proteins and lipids
 (c) Sugars and water
 (d) Supply nothing
49. Sieve tube elements and companion cells are in communication with each other by:
 (a) Vacuoles (b) Stomata
 (c) Plasmodesmata (d) Gap junctions
50. Storage of sugars, resins, latex and mucilage takes place in:
 (a) Sieve tube cells
 (b) Phloem fibres
 (c) Phloem parenchyma
 (d) Companion cells
51. The velocity of sugar movements in phloem on average is:
 (a) 1m/8years (b) 1m/sec
 (c) 1cm/day (d) 1m/hour
52. Who proposed mass-flow hypothesis?
 (a) Dixon (b) Van Mohl
 (c) Van Neil (d) Ernst munch
53. The theory which relies on the principle of osmotic pressure differences between source and sink regions is:
 (a) Pressure-flow theory
 (b) TACT
 (c) Mass-flow hypothesis
 (d) Both (a) and (c)

54. The excess glucose after respiratory needs in plants is converted into non-reducing sugar i.e.

- (a) Malt sugar (b) Cane sugar
(c) Milk sugar (d) Lactose

Growth in Plants

55. The type of meristem found at the tips of roots and shoots:

- (a) Vascular cambium
(b) Apical meristem
(c) Lateral meristem
(d) Intercalary

56. The type of meristem separated from the apex by permanent tissues, situated at base of internodes is:

- (a) Apical (b) Intercalary
(c) Lateral (d) Cork cambium

57. Which statement about lateral meristem is correct:

- (a) Cylinders of dividing cells along peripheral regions
(b) Found in woody plants
(c) Crucial for secondary growth
(d) All of above

58. Which statement describes cork cambium:

- (a) Formed in the outer layers of stem and roots
(b) Produce cork cells and bark
(c) Present at the tips of roots
(d) Both (a) and (b)

59. Increase in the length of the plants is called:

- (a) Primary growth
(b) Secondary growth
(c) Tertiary growth
(d) Quaternary growth

60. The process of primary growth occurs in _____ phases.

- (a) 2 (b) 3
(c) 4 (d) 5

61. The phases of primary growth in plants includes

- (a) Cell division
(b) Cell elongation
(c) Cell differentiation
(d) All of above

62. Non-vacuolated, small cells, spherical nuclei in the centre of cytoplasm occurs in

- (a) Zone of cell division
(b) Zone of cell elongation
(c) Zone of cell maturation
(d) Zone of cell differentiation

63. Phase of cell elongation is characterized by:

- (a) Increase in cell volume due to endosmosis
(b) Non-vacuolated cells
(c) Cells fully differentiated
(d) Each cell performs its specific functions

64. Secondary growth refers to the:

- (a) Increase in length of plant
(b) Increase in thickness or girth of stem
(c) Having primary tissue
(d) All of above

65. The region of mature stem outside of vascular cambium having secondary phloem, cork cambium and cork is collectively called:

- (a) Bark (b) Log
(c) Trunk (d) Wood

66. Annual rings are formed in plants due to the seasonal activity of _____ layer:

- (a) Cambium (b) Epidermis
(c) Mesophyll (d) Piliiferous

67. The early wood is also called:

- (a) Autumn wood
(b) Winter wood
(c) Late wood
(d) Spring wood

68. Xylem and phloem are generated by:

- (a) Cambium
- (b) Cork
- (c) Apical meristem
- (d) Intercalary meristem

69. Cambium is highly active during:

- (a) Spring
- (b) Winter
- (c) Autumn
- (d) Summer

70. The scientific method of dating and studying tree rings is called:

- (a) Histology
- (b) Gerontology
- (c) Teratology
- (d) Dendrochronology

71. The plant hormones which promotes cell division in cambium, inhibit growth at higher concentration and promote apical dominance are:

- (a) Auxins
- (b) Gibberellins
- (c) Cytokinins
- (d) Ethylene

72. Which of the following plant growth regulator promotes bolting of rosette plants?

- (a) Gibberellic acid
- (b) Indole acetic acid
- (c) Cytokinins
- (d) Ethene

73. Cytokinins are characterized by:

- (a) Promote cytokinesis during cell division
- (b) Increase rate of DNA replications
- (c) Antagonist to gibberellins
- (d) Both (a) and (b)

74. Which statement is correct about ABA:

- (a) Promotes flowering in pineapples
- (b) Promotes flowering in short-day plants and inhibits in long day plants
- (c) Promotes bolting in rosette plants
- (d) Promotes apical dominance

75. Ethylene is a natural product of metabolism of plants which:

- (a) Promotes flowering in pineapples
- (b) Inhibits fruit ripening
- (c) Promotes seed dormancy
- (d) All of above

Osmoregulation in Plants

76. The process by which an organism maintains a stable internal equilibrium of water and dissolved substance is:

- (a) Thermoregulation
- (b) Excretion
- (c) Respiration
- (d) Osmoregulation

77. A solution having reduced solute concentration relative to the intracellular environment of a cell is called:

- (a) Hypotonic environment
- (b) Hypertonic environment
- (c) Isotonic environment
- (d) None of these

78. If a cell is placed in a solution having high solute concentration relative to the intracellular environment of cell, what happens after sometime?

- (a) Swelling of cell
- (b) Shrinking of cell
- (c) Bursting of cell
- (d) Cell remain unaffected

79. In which type of environment/solution, the net movement of water between the cell and the environment is zero?

- (a) Hypotonic
- (b) Hypertonic
- (c) Isotonic
- (d) Distilled water

80. Which statement about the Marine hydrophytes is not true/correct?

- (a) Thrive in saline conditions
- (b) Expel water through hydathodes
- (c) Excrete salts by special glands
- (d) Retain water

81. Which of the following categories of plants have halophytic traits tolerate high salinity?
- Halophytes
 - Xerophytes
 - Mesophytes
 - Marine hydrophytes

82. Seaweeds and tape grass are examples of:

- Halophytes
- Xerophytes
- Mesophytes
- Hydrophytes

83. The plants which do not require any special adaptations to survive:

- Mesophytes
- Hydrophytes
- Xerophytes
- Both (b) and (c)

84. Which of the following is not a mesophyte?

- Daises
- Tomatoes
- Rose
- Blue agave

85. Pick the succulent plant.

- Marigold
- Tape grass
- Daises
- Rose

86. The plants inhabiting saline soil are:

- Halophytes
- Xerophytes
- Hydrophytes
- Marine hydrophytes

87. The plants having succulent leaves of stem, grow in high concentrations of MgSO_4 , MgCl_2 and NaCl are called:

- Xerophytes
- Halophytes
- Heliophiles
- Cacti

88. Halophytes growing in marshy places near seashore form a special vegetation known as:

- Mangrove
- Tidal woodland
- Helophilous
- All of above

Thermoregulation in Plants

89. The plants of temperate regions are adapted to survive heat stress by:

- Synthesizing heat-shock proteins
- Shedding leaves
- Synthesizing unsaturated fatty acids
- Increasing proportion solutes

90. Oaks, maples and roses are adapted to prevent ice crystal formation by:

- Heat-shock proteins
- Increasing proportion of unsaturated fatty acids
- Changing solute composition of cells
- Evaporation

Movements in Plants

91. The movements which occur as a curvature of whole organ towards or away from stimulus in plants are called:

- Autonomic
- Nastic
- Tropic
- Phototactic

92. Which of the following is not tropic movement?

- Phototropism
- Phototactic
- Geotropic
- Thigmotropic

93. The movement in response to touch is called:

- Thigmotropism
- Geotropism
- Chemotropism
- Phototropism

Photoperiodism

94. Effect of photoperiodism was first studied by Garner and Allard in:

- 1901
- 1920
- 1831
- 1960

95. The quiescent form of phytochrome is:

- P_{660}
- P_{730}
- P_{880}
- P_{700}

96. Cocklebur is an example of:

- SDPs
- LDPs
- DNPs
- FDPs

97. Flowering induced by dark periods shorter than a critical length is the characteristic of:

- SDPs
- LDPs
- DNPs
- all of them

Vernalization

98. In vernalization low temperature stimulus is received by:

- Root apex
- Shoot apex
- Leaves
- Stem

99. Duration of low temperature (chilling) treatment varies from:

- (a) 3 days to 4 months
- (b) 7 days to 1 year
- (c) 40 days only
- (d) 4 days to 3 months

100. Target of florigen hormone is:

- (a) Flower
- (b) Floral bud
- (c) Leaf
- (d) Roots

ANSWER KEY

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