Exercise-1

✍ **Marked Questions are for Revision Questions.**

ONLY ONE OPTION CORRECT TYPE

SECTION - A # PLANT TISSUES

1. When some permanent cells gets back to meristematic activity, it is referred to as
(1) Differentiation (2) Dedifferentiation (3) Meristematic shift (4) Initiation

2. Mark the lateral meristem
(1) Procambium (2) Cork cambium (3) Mass meristem (4) Primary meristem

3. Why cambium is considered a lateral meristem
(1) Because it gives rise to lateral branches
(2) Because it increases the girth of the plant
(3) Because it increases the length of the plant
(4) Because it increases the height and diameter of the plant

4.✍ Which of the following is a secondary meristem
(1) Procambium (2) Interfascicular cambium
(3) Intrafascicular cambium (4) All of these

5.✍ The term procambium is always applied to
(1) Precursors of cambium (2) Precursor of vascular tissue
(3) Both of these (4) Precursor of cortex and vascular tissue

6. The cortex of stem is derived from
(1) Dermatogen (2) Plerome (3) Periblem (4) Calyptrogen

7. The tunica is characterized by
(1) Anticlinal division only (2) Perclinal division only
(3) Divisions in all planes (4) Division in three planes only

8.✍ Quiescent centre is a reservoir of cells showing
(1) Occasional meristematic activity (2) Seasonal activity
(3) High meristematic activity (4) No meristematic activity

9. The embryonic layer responsible for the development of pericycle is
(1) Periblem (2) Plerome (3) Dermatogen (4) Calyptrogen

10. The tunica and corpus division of shoot tip is done on the basis of
(1) Plane of division (2) Rate of division (3) Two tissue zone (4) None of these

11. If a sign board was nailed on the side of tree five feet above the ground in (1965), how high would the sign be in (1978), if the tree grew 1 inches taller each year
(1) 5 feet (2) 9 feet 8 inches (3) 6 feet (4) 14 feet 8 inches

12. The meristematic cells are
(1) Differentiated cells (2) Dedifferentiated cells
(3) Mature and living (4) Immature and livin

13. Aerenchyma is usually found in
(1) Cortex (2) Pith (3) Pith rays (4) All these regions

14. The face of the cell wall where lignification occurs in Sclerenchyma
(1) Outer (2) Inner (3) Radial (4) All the faces

15. Fibres are
(1) Always aseptate (2) Always septate (3) Sometimes aseptate (4) Sometimes septate

16. Collenchyma is a
(1) Photosynthetic tissue (2) Water conducting tissue
(3) Living mechanical tissue (4) Dead mechanical tissue

17. Collenchyma differs from sclerenchyma in
(1) Retaining protoplasm at maturity (2) Having thick walls
(3) Having wide lumen (4) Being meristematic

18. Sclerenchyma tissue is
(1) Living and mechanical (2) Living and non-mechanical
(3) Dead and mechanical (4) Dead and non-mechanical

19. The tissue that gives rise to all kinds of tissues
(1) Parenchyma (2) Sclerenchyma (3) Collenchyma (4) Aerenchyma

20. The thickening in collenchyma is due the deposition of
(1) Lignin (2) Pectin (3) Cutin (4) Suberin

21. The collenchyma without intercellular spaces and having thickening at the angles is called as
(1) Angular (2) Tubular (3) Lamellar (4) Plate

22. The tissue that form the major part of the primary structure
(1) Parenchyma (2) Prosenchyma (3) Collenchyma (4) Sclerenchyma

23. Some lignified cells found in xylem having living cytoplasm in them, belong to the class of
(1) Parenchyma (2) Collenchyma (3) Sclereids (4) Fibres

24. The thickening in xylem appears on
(1) Middle lamella (2) Primary wall (3) Secondary wall (4) Tertiary wall

25. Vessels differ from tracheids
(1) In being living
(2) In the they are made up of a single cell
(3) In that they consist of a vertical row of cells with cross-wall dissolved
(4) Becasue they conduct water

26. Vessels have been observed in some pteridophytes like
(1) Selaginella (2) Isoetes (3) Rhynia (4) Lycopodium

27. Companion cells are absent in
(1) Halophytes (2) Xerophytes (3) Monocots (4) Gymnosperms

28. Mature and differentiated cells of one of the following contain cytoplasm but no nucleus
(1) Xylem paranchyma (2) Companion cells (3) Xylem vessels (4) Sieve tubes

29. Balloon like structures formed in the lumen of some non-functioning sieve tubes are called as
(1) Tylose (2) Tylosis (3) Tylasoid (4) Thylosoid

30. The albuminous cells of gymnosperms are analogous to the following of angiosperms
(1) Sieve tube (2) Sieve tube element (3) Companion cell (4) All of these

31. One of the following is absent in the phloem of monocots
(1) Sieve tubes (2) Phloem parenchyma
(3) Companion cells (4) Phloem fibres

32. The sieve cell lack
(1) Well defined sieve plate (2) Specialized sieve area
(3) Both of these (4) Sieve pores

33. Lignin is the main constituent of
(1) Growing tissues (2) Cambium (3) Wood (4) Phloem

34. Lignin is a component of the secondary cell walls of
(1) Epidermis (2) collenchyma (3) sclerenchyma (4) Parenchyma

35. Which of the following tissues is composed of mainly dead cells
(1) Phloem (2) Epidermis (3) Xylem (4) Endodermis

36. Clowes reported quiescent centre in Zea mays which represents
(1) Highest rate of mitoitc divisions (2) Slow DNA replication
(3) Slow mitotic divisions (4) Both (2) and (3)

37. If the stem apex has more than one tunica layer the most likely result is
(1) All layers get modified to cortex (2) All form epidermis
(3) Only lowermost forms cortex (4) Only outermost forms epidermis

38. They lack phloem parenchyma cells
(1) All dicots (2) Monocots with secondary growth
(3) Most of the monocots (4) both (1) and (2)

39. An example for the enucleated living plant cell is
(1) Xylem parenchyma (2) RBC
(3) Sieve tubes of phloem (4) Companion cells of phloem

40. Vascularization of plants occur in the following manner
(1) Procambium, xylem and phloem differentiate at the same time
(2) Procambium differentiate first, xylem and then phloem
(3) Procambium differentiate first,then phloem and then xylem
(4) All develop simultaneously

41. A scientist who wish to study the disease free plants will studied
(1) Cortex (2) Pith (3) Shoot apex (4) Phloem

42. The strength and rigidity of a cell wall is due to the substance known as
(1) Suberin (2) Celllulose (3) Lignin (4) Pectin

43. Silica is abundant in the cell wall of
(1) All the monocots (2) All the dicots
(3) Grasses and horsetails (4) All gymnosperms

44. Meristematic cells contain
(1) Thin homogenous cell wall (2) Dense cytoplasm
(3) Large nuclei (4) All above

45. Elongation of grass internode is due to
(1) Lateral meristem (2) Apical meristem
(3) Intercalary meristem (4) Procambium

46. A distinct nucleus is generally present in each and every plant cell at meristematic stage. During differentation the nucleus disorganizes in which of the following
(1) Phloem parenchyma (2) Companion cells (3) Vessels (4) None of the above

47. The living cells providing tensile strength are
(1) Parenchyma (2) Collenchyma (3) Sclerenchyma (4) Sclerotic cells

48. Which of the following is not true about sclereids
(1) These are also called stone cells
(2) These form sclerenchyma with fibres
(3) These are groups of living cells
(4) These are found in nut shells, guava pulp and pear

49. The jute fibres anatomically are
(1) Bast fibres (2) Cortical fibres (3) Xylem fibres (4) Pith fibres

50. Monocot leaves are formed by
(1) Intercalary meristem (2) Lateral meristem (3) Apical meristem (4) Mass meristem

51. Bamboo, grass and mint stem elongate by the activity of
(1) Primary meristem (2) Secondary meristem
(3) Intercalary meristems (4) Apical meristems

52. Maximum growth in root occurs
(1) At its tip (2) Towards light (3) Behind the apex (4) Towards apex

53. Root cap is not found in
(1) Hollyhock (2) Pistia (3) Sunflower (4) China rose

54. Which of the following is a well differentiated plant tissue
(1) Apical meristem (2) Cambium (3) Parenchyma (4) All the above

55. Which of the following is a primary meristem
(1) Intra fascicular cambium (2) Cork cambium
(3) Vascular cambium in roots (4) None of the above

56. Which of the following plants grow by a single "apical cell"
(1) Monocots (2) Dicots (3) Gymnosperms (4) Bryophyta

57. The secondary meristem originates from
(1) Promeristem (2) Primary meristem (3) Permanent tissue (4) Secretory tissue

58. The function of root cap is
(1) Protection of root tip and control of geotropic movement
(2) Storage of food products
(3) Absorption of nutrients
(4) None of the above

59. The cells of a permanent tissue do not divide because these are
(1) Dead (2) enucleate
(3) Arrested at G_1 stage (4) Arrested at prophase

60. Leaf primordium grows by
(1) Apical meristem (2) Intercalary meristem (3) Mass meristem (4) both 1 & 2

61. In which of the following ways parenchyma is the basic or fundamental type of tissue
(1) Morphologically (2) Physiologically (3) Phylogentically (4) All the above

62. Aerenchyma is helpful to plant by
(1) Providing buoyancy in hydrophytes (2) Promoting photosynthesis
(3) Give mechanical strength to plants (4) Giving flexibility to plants

63. Flesh of a fruit is mostly made up of
(1) Parenchyma (2) Collenchyma (3) Sclereids (4) Meristem

64. Collenchyma is found in
(1) Herbaceous climbers (2) Hydrophytes
(3) Woody climbers (4) Xerophytes

65. Collenchyma differs from sclerenchyma in
(1) Retaining protoplasm at maturity (2) Having thick walls
(3) Having a wide lumen (4) Being meristematic

66. Which of following plant cells are without vacuoles and without nuclei
(1) Cambium cells (2) Xylem vessels (3) Root hairs (4) Companion cells

67. The tissue responsible for translocation of food material is
(1) Parenchyma (2) Sieve tubes (3) Vessels (4) Fibres

68. A mature sieve tube differs from a vessel-
(1) In lacking a functional nucleus (2) Absence of lignified walls
(3) Being nearly dead (4) Lacking cytoplasm

69. Vessels and companion cells are respectively present in the xylem and phloem of
(1) Gymnosperm (2) Pteridophytes (3) Angiosperm (4) Bryophyta

70. Sieve plates in angiosperms are

(1) Oblique & in lateral walls (2) Straight & in end wall
(3) Oblique & in end wall (4) Straight & in lateral wall

71. Bordered pits occur in
(1) Sec. Phloem (2) Protoxylem
(3) Metaxylem (4) Bark

72. Complex tissues are not found in
(1) Few bryophytes (2) Pteridophytes
(3) All gametophytes (4) All spermatophytes

73. End walls of tracheids and vessels respectively are
(1) Pitted & perforated (2) Perforated & pitted
(3) Both perforated (4) Both pitted

74. Sieve tubes are ideal for nutrient transport because they have
(1) No end walls (2) Bordered pits
(3) Narrow lumen rich in cytoplasm (4) Broad lumen with little peripheral cytoplasm

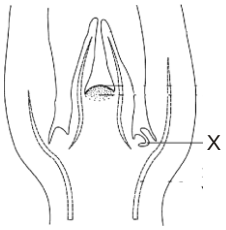
75. In which of the following order, an exarch xylem develops
(1) Centripetal (2) Centrifugal
(3) Both centripetal & centrifugal (4) Irregular

76. Which of the following is / are correct statement with respect to Parenchyma?
(a) The cells of the parenchyma are generally isodiametric
(b) They may either be closely packed or have small intercellular spaces.
(c) They provide major mechanical support to the growing parts of the plant.
(d) Their walls are thin and made up of cellulose.
(1) a, b and c (2) b, c, d (3) a, b, d (4) a, b, c, d

77. Which of the following is / are correct statement
(a) The parenchyma perform various function like photosynthesis, storage, secretion
(b) Cells of collenchyma are much thickened at the corner due to a deposition of cellulose, hemicellulose & pectin.
(c) Cells of sclerenchyma are usually dead and without protoplasts.
(d) Pararenchyma, collenchyma & sclerenchyma are simple permanent tissues.
(e) The cells of mass meristem divide in almost all the planes.
(1) a, b, c, d, e (2) a, b, c (3) a, c, d, e (4) a, b, c, e

78. Which statement is wrong
(a) In conjoint vascular bundle xylem and phloem are located on different radii
(b) When xylem is in centre surrounded on all sides by phloem then vascular bundle is known as Amphicribal vascular bundle
(c) All tissues on the innerside of the endodermis such as pericycle, vascular bundles and pith constitute the stele
(d) The inner most layer of the cortex is called endodermis
(1) only b & d (2) only a (3) only b, c, d (4) only a, c

79.# The region X will form



(1) Leaves (2) Branches (3) Flowers (4) Both (2) and (3)

SECTION - B # Tissue System

1. The tissue in the roots to absorb water and minerals is

(1) Epidermal appendages (2) Epidermal extensions

(3) Hypodermis (4) Endodermis

2. The most common type of ground tissue is

(1) Epidermis (2) Collenchyma (3) Sclerenchyma (4) Parenchyma

3. Match the wall components listed under **column-I** with the type of tissues / tissue systems listed under **column-II** choose the answer which gives the correct combination of the alphabetes

Column-I	**Column-II**
(Well components)	(Tissue / tissue system)
(1) Suberin	p. Sclerenchyma
(2) Lignin	q. Collenchyma
(3) Pectin	r. Epidermis
(4) Cutin	s. Phellem
	t. Parenchyma

(1) A = s, B = t, C = p, D = r (2) A = s, B = t, C = q, D = r

(3) A = s, B = p. C = q, D = r (4) A = s, B = q, C = p, D = r

4. Laticiferous cells can be traced in

(1) pith (2) Phloem (3) Cortex (4) Both (1) and (3)

5. The casparian strip is usually composed of

(1) Lignin (2) Pectin (3) Cutin (4) Suberin

6. A thin walled sheath present around the vascular bundles in C_4 plants is called as

(1) Arm parenchyma (2) Border parenchyma

(3) Spongy parenchyma (4) Perivascular parenchyma

7. The stem branches arise from

(1) Outer cortex (2) Inter cortex (3) Pericycle (4) Hypodermis

8. Dumbbell shaped guard cells are found in

(1) Zea (2) Allium (3) Nerium (4) Cucurbita

9. Leaves of many grasses are capable of folding and unfolding because they

(1) Are very thin (2) Are isobilateral

(3) Have specialized bulliform cells (4) Have parallel vascular bundles

10. The unthickened cells of endodermis are

(1) Cambial cells (2) Passage cells

(3) Both of these (4) None of these

11. Pericycle is
(1) Parenchymatous in root and selerenchymatous in stem
(2) Parenchymatous in root and collenchymatous in stem
(3) Collenchymatous in root and parenchymatous in stem
(4) Sclerenchymatous in root and collenchymatous in stem

12. A vascular Bundle in which phloem is on both the sides of the xylem and separated from it by strips of cambium is said to be
(1) Collateral open (2) Bicollateral open
(3) Concentric (4) Bicollateral closed

13. Amphivasal vascular bundles are found in
(1) Cycas and Dryopteris (2) Dracaena and Yucca
(3) Helianthus and Cucurbita (4) Maize and wheat

14. Amphicribal vascular bundles are
(1) Endarch (2) Exarch (3) Mesarch (4) All of these

15. A layer of suberised cells below the epidermis of root of certain plants is
(1) Second epidermis (2) Hypodermis (3) Exodermis (4) Endodermis

16. In leaves, the vascular bundles are
(1) Bicollateral & open (2) Collateral & open (3) Collateral & closed (4) Radial & exarch

17. Passage cells more distinct in endodermis of
(1) Dicot stem (2) Monocot stem (3) Dicot root (4) Monocot root

18. When protoxylem faces pericycle, it is called
(1) Endarch (2) Mesarch (3) Exarch (4) Polyarch

19. In true hydrophytes, the stomata are present on
(1) upper epidermis (2) lower epidermis (3) Both (4) None of the above

20. Type of vascular bundles in fern roots
(1) hadrocentric (2) Lepotcentric (3) Conjoint collateral (4) Radial

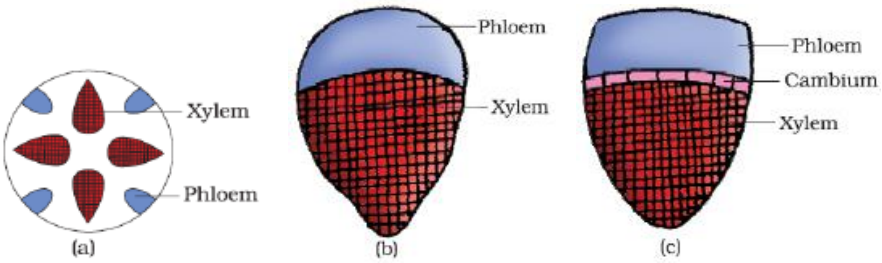
21. Which of the following is / are correct statement
(a) Exarch xylem condition present in roots
(b) Endarch xylem condition present in stem
(c) Open type of vascular bundle present in Dicot stem
(d) Monocot stem posses closed vascular bundles
(e) Gymnosperms have sieve tubes & companion cells
(1) a, b, c, d, e (2) a, b, c, e (3) a, b, c, d (4) a, c, d, e

22. Match the column

Column I	**Column II**
(a) Mature sieve element	(i) Sclerenchymatous cells

(b) Bast Fibres (ii) Stomata
(c) Epidermal Tissue system (iii) Mesophyll
(d) Ground Tissue (iv) lacks a nucleus
(1) a (iv) , b (i) , c (ii) , d (iii) (2) a (i) , b (ii) , c (iii) , d (iv)
(3) a (iv) , b (i) , c (iii), d (ii) (4) a (iv) , b (ii) , c (iv) , d (i)

23.# By observing various type of vascular bundles which is / are correct ?



(1) a - radial ; b - conjoint closed ; c - conjoint open
(2) a - conjoint closed ; b - radial ; c - conjoint open
(3) a - conjoint open ; b - conjoint closed ; c - radial
(4) a - radial ; b - conjoint open ; c - conjoint closed

SECTION - C # Anatomy of plant parts

1. The xylem is exarch in
(1) Stem (2) Root (3) Leaf (4) Petiole

2. Collenchymatous hypodermis is characteristic feature of
(1) Dicot stem (2) Monocot stem
(3) Monocot as well as dicot stem (4) Hydrophytes

3. T.S. of a plant part exhibits conjoint collateral endarch and closed bundles scattered in a ground tissue that should be the part
(1) Monocot root (2) Dicot root (3) Monocot stem (4) Dicot stem

4. Cortex and pith are not distinguished in
(1) Monocot stem (2) Monocot root (3) Dicot stem (4) Dicot root

5. Sclerenchymatous bundle sheath is present in
(1) Grass (2) Sunflower (3) Banyan (4) Gram

6. Pith is not well developed in
(1) Monocot stem (2) Monocot root (3) Dicot Stem (4) Dicot root

7. In dicot Root
(1) Vascular bundles are scattered with cambium
(2) Vascular bundles are open and arranged in a ring
(3) Xylem and phloem are radial
(4) Xylem is always endarch

8. Polyarch and exarch vascular bundles are the characteristic of
(1) Dicot stem (2) Dicot root
(3) Monocot stem (4) Monocot root

9. Vascular bundles in Cucurbita stem are

(1) Bicollateral & open (2) Bicollateral & closed

(3) Collateral & open (4) Amphivasal

10. Position of xylem & phloem in leaf respectively

(1) Abaxial & Adaxial (2) Adaxial & Abaxial

(3) Both Adaxial (4) Both abaxial

11. In internal tissue organization of dicotyledonous root the outermost layer is ..... (i)..... many of the epidermal cells protrude in the form of unicellular root hairs. The ..... (ii)..... consist of several layers of thin walled parenchymatous cells with intercellular spaces. The innermost layer of the cortex is called ..... (iii)..... All tissues on the innerside of the endodermis such as pericycle, vascular bundles & pith constitute the ..... (iv)..... .

(1) (i) cortex, (ii) epidermis, (iii) endodermis (iv) stele

(2) (i) epidermis, (ii) cortex (iii) endodermis (iv) stele

(3) (i) endodermis (ii) cortex (iii) epidermis (iv) stele

(4) (i) stele (ii) cortex (iii) endodermis (iv) epidermis

12. Which statement is wrong regarding monocot root?

(i) There are usually more than six (polyarch) xylem bundles

(ii) Pith is large & well developed

(iii) Monocot roots do not undergo any secondary growths

(iv) The pith is small or inconspicuous

(1) (ii) & (iv) (2) (ii) only

(3) (iv) only (4) (i) only

13. Match Column-I with column-II

Column-I	**Column-II**
(i) Casparian strips	(1) Endodermis
(ii) Initiation of lateral roots & vascular cambium	(2) Pericycle
(iii) Passage cells	(3) Transfusion cells
(iv) Rhizodermis	(4) Suberized cells of outer layer of cortex

(1) (i) a ; (ii) b ; (iii) c ; (iv) d (2) (i) a ; (ii) b ; (iii) d ; (iv) c

(3) (i) a ; (ii) c ; (iii) b ; (iv) d (3) (i) b ; (ii) a ; (iii) c ; (iv) d

14. Find wrong match

Type of root/stem	**Vascular Bundle**
(i) Dicot root	Diarch to hexarch
(ii) Monocot root	Polyarch
(iii) Monocot stem	Conjoint, collateral, closed, endarch
(iv) Dicot stem	Conjoint, collateral, open, endarch

(1) only (iv) (2) only (iii) (3) only (ii) (4) None of these

15.

		Monocot stem	**Dicot stem**
(i)	Hypodermis	(a)	(b)
(ii)	Vascular Bundles	(c)	(d)

(1) a → collenchymatous
b → sclerenchymatous
c → scattered
d → arranged in a ring

(2) a → sclerenchymatous
b → collenchymatous
c → scattered
d → arranged in a ring

(3) a → collenchymatous
b → sclerenchymatous
c → arranged in a ring
d → scattered

(4) a → sclerenchymatous
b → collenchymatous
c → arranged in a ring
d → scattered

16. Which statement is / are wrong with respect to leaf -
(1) In dorsiventral leaf abaxial epidermis generally bears more stomata than the adaxial epidermis.
(2) In dorsiventral leaf Mesophyll has Pallisade parenchyma & spongy parenchyma
(3) In grasses certain adaxial epidermal cells modified into bulliform cells
(4) In an isobilateral leaf the stomata are present on both the surface of the epidermis
(1) b and c (2) a, b and d (3) c and d (4) None of these

SECTION - D # Secondary Growth

1. Shoot dies if
(1) Phloem is blocked (2) Bark is removed
(3) Apical meristem is injured (4) Xylem is removed

2. Which is absent in closed vascular bundle of stem
(1) Xylem (2) Phloem (3) Cambium (4) All of the above

3. In stem Xylem is
(1) Exarch (2) Endarch (3) Polyarch (4) Hexarch

4. In a dorsiventral leaf location of palisade tissue and phloem are
(1) Both on adaxial side (2) Adaxial
(3) Adaxial and Abaxial side (4) Any where

5. Annual rings are found in plants growing in
(1) Arctic region (2) Grassland (3) Temperate region (4) All of the above

6. Amount of secondary xylem as compared to secondary phloem formed every year is
(1) Equal (2) 8 -10 times (3) Half (4) 4 - 5 times

7. An example of monocots showing secondary growth in stem is
(1) Lilium (2) Cocos (3) Asparagus (4) Yucca

8. Intrafascicular cambium is situated
(1) In between the vascular bundles (2) Inside the vascular bundles
(3) Outside the vascular bundles (4) In pith

9. Complementary cells of lenticels are
(1) Compact and suberised (2) Loose and non suberised

(3) Compact and lignified (4) Loose and lignified

10. The wood of commerce is
(1) Alburnum (2) Duramen (3) Spring wood (4) Autumn wood

11. Outer layer of bark is
(1) Epidermis (2) Rhytidome (3) Phellloderm (4) Lenticel

12. Common features between lenticels and hydathodes are
(1) Both allow exchange of gases
(2) Always remain closed
(3) There is no regulation of their opening & closing
(4) They occur on the same organ of plant

13. Cork cambium is
(1) Always primary meristem (2) Always secondary meristem
(3) May be secondary or primary meristem (4) Partly primary & Partly secondary meristem

14. Which tissue remains more active during autumn
(1) Vascular cambium (2) Cork cambium (3) Parenchyma (4) Sclerenchyma

15. Formation of which tissue is example of dedifferentiation
(1) Inter fascicular cambium (2) Apical meristem
(3) Intra fascicular cambium (4) Intercalary meristem

16. In dicot root, vascular cambium originates from
(1) Conjunctive tissue (2) pith rays (3) Pericycle (4) 1 & 3 both

17. In dicot root which tissue becomes dead due to activity of phellogen
(1) All tissue outside cortex (2) Tissue outside hypodermis
(3) Tissue outside endodermis (4) Tissue outside pericycle

18. Formation of secondary xylem and phloem is respectively
(1) Centrifugal and centripetal (2) Centripetal and centrifugal
(3) Both centripetal (4) Both centrifugal

19. Normal secondary growth takes place in
(1) Dicots & Monocots (2) Gymnosperms & Monocots
(3) Dicots & Gymnosperms (4) Only in dicots

20. Living tissue in lenticel is called
(1) Conjunctive tissue (2) Connective tissue
(3) Complementary tissue (4) Phelloderm

21. Extra stellar secondary growth occurs due to the activity of
(1) Intrafascicular cambium (2) Inter fascicular cambium
(3) Vascular cambium (4) Cork cambium

22. Which of the following provide maximum mechanical strength to a tree trunk.
(1) Heart wood (2) sap wood (3) Cork (4) Late wood

23. Formation of vascular rays occurs in which order
(1) Centripetal (2) Centrifugal (3) Acropetal order (4) 1 & 2 both

24. Most conspicuous annual rings form in
(1) Temperate evergreen plants (2) Tropical deciduous
(3) Temperate deciduous plants (4) Tropical evergreen

25. Cambium cells divide in which plane
(1) Tangential (2) Radial (3) Oblique (4) Anticlinal

26. Which would do maximum harm to a tree
(1) Loss of half of its leaves (2) Loss of half of its branches
(3) Loss of all of its leaves (4) Loss of all its bark

27. External Protective tissues are
(1) Cortex and epidermis (2) Cork and pericycle
(3) Cortex and pericycle (4) Cork and epidermis

28. Lenticels do not occur on
(1) Stem (2) Root (3) Leaf (4) Fruit

29. In which of the following there is no differentiation of heart wood and sap wood
(1) Neem (2) Ashok (3) Mango (4) Palm

30. Sap wood differ from heart wood in being
(1) Darker and non conducting (2) Softer and non conducting
(3) Lighter and conducting (4) Hard, darker and less conducting

31. When a tree grows older which of the following increase rapidly -
(1) Heart wood (2) Sap wood (3) Pith (4) Cortex

32. Knots are formed in the wood due to
(1) External injuries (2) Bases of the branches get buried in main stem
(3) Leaf scars (4) Insect bites

33. Growth rings are formed due to the activity of
(1) Intrastelar Cambium (2) Intercalary Cambium
(3) Extrastelar cambium (4) Primary cambium

34. Annual rings and growth rings are formed due to the fluctuations in the activity of
(1) xylem (2) phloem (3) xylem and phloem (4) cambium

35. Annual rings are the bands of
(1) Secondary cortex and cork (2) All secondary vascular tissue
(3) Secondary xylem and xylem rays (4) Secondary phloem and medullary rays

36. The trees growing in deserts will
(1) Show alternate rings of xylem and sclerenchyma
(2) Show distinct annual rings
(3) Not show distinct annual rings
(4) Show the activity of cambium

37. Annual rings are well demarcated in trees growing in

(1) Simla (2) Mumbai (3) Chennai (4) Udaipur

38. How many growth rings should be developed per year in a plant grown in Rajasthan with four distinct seasons (Viz, summer rains, winter and spring)
(1) Four (2) Two (3) one (4) none of the above

39. The Process by which the plant becomes woody is called
(1) Calcification (2) Lignification (3) Impregnation (4) Fossilization

40. Compact wood with little parenchyma is termed
(1) Heart wood (2) Hard wood (3) Pycnoxylic wood (4) Manoxylic wood

41. Abnormal secondary growth is observed in
(1) Dracaena (2) Wheat (3) Ginger (4) Rice

42. The cambium ring becomes active and begins to cut off new cells, both towards the inner and the outersides. The cells cut off towards pith, mature into ....(i).... and the cells cut off towards periphery mature into ....(ii).... . In this question (i) & (ii) are respectively -
(1) (i) secondary phloem, (ii) secondary xylem
(2) (i) secondary xylem, (ii) secondary phloem
(3) (i) epidermis, (ii) pericycle
(4) (i) pericycle, (ii) epidermis

43. Select the incorrect statement with respect to secondary growth
(1) intrafascicular and interfascicular cambium are joined to form vascular cambium
(2) secondary phloem is formed 8-10 times more as compared to secondary xylem
(3) secondary growth has been reported in some monocotyledons such as palm, Yucca, Dracaena,
(4) In dicot stem some part of vascular cambium is primary and some part is secondary.

44. Select the correct statement
(i) In the spring season vascular cambium is very active
(ii) Wood formed during spring season known as early wood or spring wood
(iii) In winter the vascular cambium is more active
(iv) the autumn wood is lighter in colour and has a lower density
(1) (i) & (iii) only (2) (i), (ii), (iii) (3) (i) & (ii) only (4) All are correct.

MISCELLANEOUS QUESTIONS

1. .....(i).... wood does not conduct water but if given mechanical support to the stem. The peripheral region of the secondary xylem is lighter in colour and is known as the ....(ii)…. which is involved in the conduction of water and minerals from root to leaf. (i) & (ii) are respectively.
(1) Heartwood, sapwood (2) Sapwood, Heart wood
(3) Alburnum, Duramen (4) 2 & 3 both

2. Bark is a non technical term that refers to
(1) All tissues exterior to the vascular cambium
(2) All tissues exterior to the cork cambium
(3) All tissues interior to the vascular cambium
(4) All tissues interior to the cork cambium

3. At certain regions, the phellogen cuts off closely arranged parenchymatous cells on the outer side instead of cork cells, these parenchymatous cells soon rupture the epidermis, forming a lens shaped opening called

(1) complimentary cells (2) lenticels (3) bark (4) secondary cortex

4. Which statement is true with respect to secondary growth in roots

(i) In the dicot root, the vascular cambium is completely secondary in origin

(ii) conjuctive tissue becomes meristematic below phloem bundles.

(iii) cells of pericycle lying opposite to protoxylem also becomes meristematic to form additional strip of cambium.

(iv) conjoint collateral type of vascular bundles present in roots

(1) (i), (ii), (iii) (2) (i), (ii) only (3) (ii), & (iii) only (4) All are correct

5. Match column-I with column-II

Column-I	**Column-II**
(i) Porous wood	(1) Vessels are absent in xylem
(ii) Non porous wood	(2) Vessels are present in xylem
(iii) Ring porous wood	(3) Neem
(iv) Diffused porous wood	(4) Dalbergia

(1) (i) b ; (ii) a ; (iii) d ; (iv) c (2) (i) b ; (ii) a ; (iii) c ; (iv) d

(3) (i) d ; (ii) a ; (iii) c ; (iv) b (4) (i) c ; (ii) a ; (iii) d ; (iv) b

6. Which statement is wrong with respect to bark?

(i) All the tissues formed outside the vascular cambium is called bark

(ii) The dead tissue present outside the cork cambium is generally called outer bark

(iii) Rhytidome includes cork and tissues which become dead due to the pressure of cork

(iv) Bark that is formed early in the season is called hard bark

(1) (i) & (ii) (2) (iii) & (iv) (3) (iii) only (4) (iv) Only

7. Match the column

Column I	**Column II**
(a) Heart wood	(i) Mechanical support to the stem
(b) Sap wood	(ii) Conduction of water & minerals
(c) Spring wood	(iii) Early wood
(d) Autumn wood	(iv) Late wood

(1) a (iv) , b (iii) , c (ii) , d (i) (2) a (i) , b (ii) , c (iv) , d (iii)

(3) a (i) , b (ii) , c (iii) , d (iv) (4) a (i) , b (iii) , c (ii) , d (iv)

8. Vascular cambium include -

(1) Intrafascicular cambium (2) Interfascicular cambium

(3) 1 & 2 both (4) None of these

9. Which of the following statements are true-

(a) Bark is of two types - soft bark and hard bark.

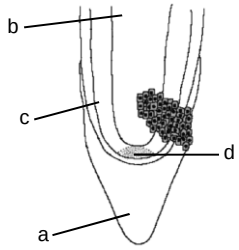
(b) At certain regions phellogen cuts off parenchymatous cells on inner side instead of cork cells which soon ruptures epidermis, forming lenticels.

(c) In dicot root, vascular cambium is completely secondary in origin.

(d) Bark is a non technical term that refers to all tissues interior to vascular cambium

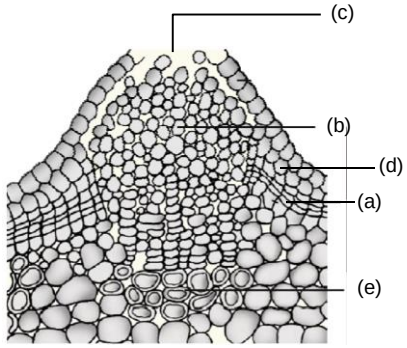
(1) (a),(b) and (c) (2) (b),(c) and (d) (3) (a) and (c) (4) (b) and (c)

10.# In the given figure a,b,c,d respectively are-



	(a)	(b)	(c)	(d)
(1)	Root cap	Central cylinder	Protoderm	Root apical meristem
(2)	Root apical meristem	Central cylinder	Protoderm	Root cap
(3)	Root cap	Protoderm	Central cylinder	Root apical meristem
(4)	Root apical meristem	Protoderm	Central cylinder	Root cap

11.# Label the following figure-



	(a)	**(b)**	**(c)**	**(d)**	**(e)**
(1)	Phellogen	Complementary Cells	Lentical	Phelloderm	Phellem
(2)	Phellem	Lentical	Complementary Cells	Phellogen	Phelloderm
(3)	Phellogen	Complementary Cells	Lentical	Phellem	Phelloderm
(4)	Phelloderm	Complementary Cells	Lentical	Phellem	Phellogen

12. Identify the wrong statement-

(1) Isolilateral leaf have equal stomata on abaxial and adaxial surface.

(2) Bulliform cells are abascial epidermal cells.

(3) In dorsiventral leaf adascial side have more stomata than abaxial.

(4) Bulliform cells are large, empty, colourless cells

13. Identify the wrong statement-

(1) Trichomes helps in increasing water loss due to transpiration.

(2) Cuticle absent in roots.

(3) Trichomes may be branched or unbranched.

(4) Epidermal cells have longe vacuole.

14. Cotton fibre is part of

(1) epidermal tissue system (2) vascular tissue system
(3) meristematic tissue system (4) ground tissue system

15. Procambium forms the
(1) cork cambium (2) vascular tissue (3) Vascular cambium (4) intercalary meristem

16. Tyloses are
(1) compound sieve plates
(2) lactiferous channels
(3) specialized secretory cells
(4) tracheal plugs which plug the lumenof vessels and tracheids

17. Suberin is a
(1) fatty substance (2) polypeptide (3) polysaccharide (4) alkaloid

18. Intercalary meristem is located in
(1) petiole and internodes (2) stem tip
(3) root (4) latex

19. Annual rings are formed basically due to
(1) marked seasonal variations (2) different development of xylem and phloem
(3) uniform climate conditions (4) different kinds of phloem

20. The apical meristem of the root is present
(1) only in radicle (2) only in tap roots
(3) only in adventitious roots (4) In all the roots

21. Diffuse porous woods are characteristic of plants growing in
(1) alpine region. (2) cold winter regions (3) temperate climate (4) tropical

22. Cork cambium produce
(1) Cork & sec. phloem (2) sec. phleom & sec. xylem
(3) Cork & sec. cortex (4) sec. xylem & vascular rays

23. Which is not true for dicot root
(1) less developed pith or absent (2) secondary growth
(3) both (4) 15-20 vascular budles

24. The differentiation of Palisade tissue and spongy parenchyma is found in
(1) Isobilateral leaf (2) dorsiventral leaf (3) both (4) none

25. Sieve tube differs from vessels in
(1) lack of functional nucleus (2) being dead
(3) lack of lignin (4) none

26. Bicollateral bundles are found in
(1) Cucurbitaceae (2) Malvaceae (3) Brassicaceae (4) none of these

27. Vascular bundles with cambium are called
(1) Closed (2) Open (3) Exarch (4) Endarch

28. When phloem is surrounded by xylem
(1) Amphicribal (2) Amphivasal (3) Conjoint (4) Collateral

29. Lignification is associated with
(1) Xylem (2) Phloem (3) Parenchyma (4) Chlorenchyma

30. Periderm includes-
(1) Phellem,Phelloderm,Plerome (2) Phellem,Phellogen,Dermatogen
(3) Phellem,Phellogen,Phelloderm (4) Phellem,Phellogen, Cortex

31. Jute fibres deteriorate because they have
(1) High cellulose (2) Low cellulose (3) High lignin (4) Low lignin.

32. Which one has perforated wall
(1) Tracheid (2) Vessel (3) Fibre (4) Sclereid.

33. Bicollateral vascular bundles have tissue arrangement
(1) Outer phloem – Outer cambium – Middle xylem – cambium – Inner phloem
(2) Outer phloem – xylem – Outer cambium – Inner xylem
(3) Outer phloem – Outer xylem – Middle cambium.
(4) Outer cambium – Outer phloem – Middle xylem – Inner phloem – Inner cambium.

34. Vascular cambium of stem is
(1) Primary meristem (2) Partly primary and partly secondary
(3) Secondary meristem (4) Intercalary meristem.

35. Identify correct order of components with reference to their arrangement from outside to inner side in a woody dicot stem.
1. Secondary cortex 2. Autumn wood 3. Secondary phloem 4.Phellem
(1) 2, 3,1,4 (2) 4,1,3, 2 (3) 1,2,4,3 (4) 3,4,2,1.

36. Inner darker, harder portion of secondary xylem that cannot conduct water in older dicot stem is called
(1) Alburnum (2) Bast (3) Duramen (4) Wood.

37. Identify the plant tissue in which lignin is absent
(1) Collenchyma (2) Sclerenchyma (3) Sclereids (4) Xylem tracheid

38. Vascular bundles having phloem on the periphery of both outer and inner cambium are
(1) Biocollateral closed (2) Biocollateral open (3) Radial (4) Biradial

39. Living part of xylem is
(1) Xylem tracheids (2) Xylem vessels (3) Parenchyma (4) None of the above.

40. Palisade parenchyma is present on both sides in
(1) Nerium (2) Eucalyptus (3) Wheat (4) Both 1 and 2

41. Which of the following are not true
a. Cork cambium is otherwise called phellogen
b. Cork is otherwise called phellem.
c. Secondary cortex is otherwise called periderm.
d. Cork cambium , cork and secondary cortex are collectively called phelloderm
(1) b and d only (2) b and c only (3) c and d only (4) a and b only

42. Vascular cambium produces

(1) Secondary xylem and secondary phloem (2) Secondary xylem only
(3) Secondary phloem only (4) Primary xylem and primary phloem.

43. Phellogen is also known as
(1) Vascular cambium (2) Periderm (3) Cork cambium (4) Apical meristem.

44. Bordered pits are elongated transversely and arranged in vertical series. The pattern is known as
(1) Scalariform pitting (2) Intervascular pitting
(3) Reticulate thickening (4) Oblique pitting

45. Large nearly empty, colourless cells present on upper surface of grass leaf are
(1) Accessory cells (2) Bulliform cells
(3) Palisade parenchyma (4) Passage cells.

46. Collateral open vascular bundles and eustele are found in
(1) Dicot root (2) Dicot stem (3) Monocot stem (4) Monocot root.

47. Radial vascular bundles occur in
(1) Dicot root (2) Monocot root (3) All roots (4) Dicot stem.

48. Lacunate collenchyma is found in the stem of
(1) Leucas (2) Monstera (3) Cucurbita (4) None of the above.

49. Xylem produced through centrifugal differentiation is
(1) Exarch (2) Endarch (3) Mesarch (4) Centrarch.

50. Match the columns

	Column-I		**Column-II**
1	Radial vascular bundle	a	Cucurbita pepo
2	Collateral vascular bundle	b	Dracaena
3	Bicollateral vascular bundle	c	Roots of angiosperms
4	Amphicribal vascular bundle	d	Sunflower
5	Amphivasal vascular bundle	e	Fern

(1) 1 – c, 2 – d, 3 – a, 4 – e, 5 – b (2) 1 – c, 2– b, 3 – a, 4 – e, 5 – d
(3) 1 – d, 2 – e, 3 – a, 4 – b, 5 – c (4) 1 – c, 2– a, 3 – b, 4 – d, 5 – e.

51. Collenchyma is
(1) Living with no reserve food (2) Living with protoplasm
(3) Dead and hollow (4) Dead with reserve food.

52. Endodermis takes part in
(1) Providing protection (2) Preventing water loss from stele
(3) Maintaining rigidity (4) All the above.

53. Intercalary meristem results in
(1) Secondary growth (2) Primary growth (3) Apical growth (4) None of the above.

54. Bulliform cells are found in
(1) Seeds of sunflower (2) Leaf of wheat (3) Pod of pea (4) Tuber of Potato.

55. In autumn and winter, cambium produces
(1) Sap wood (2) Heart wood (3) Early wood (4) Late wood.

56. Complementary cells are associated with
(1) Lenticels (2) Hydathodes (3) Rhytidome (4) Bark.

57. In a vascular bundle, if xylem vessels develop in a centripetal fashion the xylem is likely to be
(1) Centrarch (2) Mesarch (3) Exarch (4) Endarch.

58. Identify the plant parts whose transverse section show a clear and prominent pith
(1) Dicot stem and monocot root (2) Dicot stem and monocot stem
(3) Dicot stem and dicot root (4) Dicot root and monocot root.

59. The waxy material deposited in the casparian strip of the endodermis is
(1) Pectin (2) Suberin (3) Cellulose (4) Lignin

60. Idioblast is
(1) Plant cell different form others (2) Animal cell different from others
(3) Plant cell having cell inclusions (4) Animal cell having cell inclusions.

61. Sequence of cellular layers from the periphery towards the cortex in an old dicot stem is
(1) Epidermis, Phellogen, Phellem, Exodermis
(2) Epidermis, Hypodermis, Phellogen, Phelloderm
(3) Epidermis, Phellem, Phellogen, Phellloderm
(4) Epidermis, Hypodermis, Cortex, Endodermis.

62. The vascular cambial ring of a dicot stem is
(1) Primary in origin
(2) Secondary in origin
(3) Partly primary partly secondary in origin
(4) Embryonic in origin

63. Duramen is present in
(1) Inner region of secondary wood (2) Part of sap wood
(3) Outer region of secondary ray (4) Region of pericycle.

64. Tyloses are seen in
(1) Collenchyma (2) Phloem cells
(3) Ray parenchyma (4) Ray parenchyma and xylem cells.

65. P-proteins are associated with
(1) Sieve tube elements (2) xylem parenchyma
(3) trichomes (4) tracheids and vessels

66. Which of the following tissue is complex?
(1) Sclereids (2) Xylem (3) Collenchyma (4) Liver

67. Kranz anatomy is a feature of
(1) hydrophytes (2) xerophytes (3) C_3-plants (4) C_4 -plants

68. Wilting of plant is due to
(1) blockage of phloem (2) blockage of xylem
(3) when some roots and phloem are removed (4) tracheid is blocked

69 . Duramen is present in
(1) inner region of secondary wood (2) part of sap wood
(3) outer region of secondary wood (4) region of pericycle

70. Outer part of bark consisting of dead cells refers to
(1) rhytidome (2) phellem (3) phellogen (4) phelloderm

71. Maximum amount of growth in root occurs
(1) in the absence of light (2) at its apex
(3) behind the apex (4) in the presence of soil

72. A monocot stem with secondary growth is
(1) Lilium (2) Cocos (3) Yucca (4) Asparagus

73. Lateral roots develop from primordia originated by the division of
(1) Pericycle cells lying opposite to protoxylem points
(2) Pericycle cells lying between two protoxylem points
(3) Endodermal cells lying between two protoxylem points
(4) Endodermal cells lying opposite to protoxylem points

74. Velamen is present in roots of
(1) Vanda (2) Rhizophora (3) Asparagus (4) Maize

75. An old trunk of Shisham **(Dalbergia sissoo)** tree would possess maximum amount of
(1) Primary xylem (2) Secondary xylem
(3) Primary phloem (4) Secondary cortex

76. Vascular bundles are arranged in a ring in stem of
(1) Wheat (2) Rice (3) Gram (4) Maize

77. Kranz anatomy can be observed in leaves of
(1) Sorghum (2) Spinach (3) Mustard (4) Tulip

78. In higher plants, transport of food material occurs through
(1) Companion cells (2) Sieve elements (3) Tracheids (4) Transfusion tissue

79. The term 'Bark' refers to
(1) Phellem, Phelloderm and Vascular cambium
(2) Periderm and Secondary xylem
(3) Cork cambium and Cork
(4) Phellogen, Phellem, Phelloderm and Secondary phloem

80. Select the WRONG statement from the following
(1) Bulliform cells are present in the leaves of monocots
(2) Intrafascicular cambium is present in monocots

(3) Phellem, phellogen and phelloderm constitute the periderm
(4) Spring wood and autumn wood constitute an annual ring

81. Monocot root can be distinguished from dicot root by the
(1) Presence of cambium (2) Number of vascular bundles 2 to 6
(3) Presence of pericycle (4) Larger pith

Exercise-2

1. The living tissue that provides support to the growing parts of the plant is **(2nd NSEB)**
(1) Sclerenchyma (2) Collenchyma (3) Parenchyma (4) Fibres

2. With reference of the bark, which one of the following statements is false **(3rd NSO I L)**
(1) It is tissue which is living (2) It is a tissue external to innermost phellogen
(3) Protects loss of water (4) Protects the tree from infection

3. Callus exposed to low auxin and moderate cytokinin concentration will result in **(4th NSEB)**
(1) Multiple shoots (2) roots (3) Plantlets (4) No change

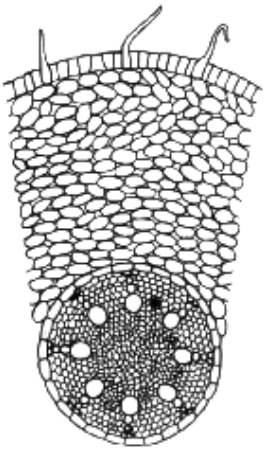
4. Major part of wood of old dicot stem is filled with tannins, resins and gums. This part is called
(1) heart wood (2) soft wood (3) sap wood (4) hard wood

5. In the stelar evolution, the type of stele that is highly evolved is **(2nd ABO)**
(1) dictyostele (2) haplostele (3) solanostele (4) atactostele

6. A branch is cut off very close to the trunk and the wound heals fast. In another tree, a cut is made leaving a stump projecting some distance beyond the trunk, delaying the healing. This is because of the distance of the cut form the **(FINBO)**
(1) Vascular cambium (2) Cork cambium
(3) Apical meristem (4) Interfascicular cambium

7. The major function of sieve tubes in plants is **(1st NSEB)**
(1) Mechanical support (2) Translocation of water and minerals
(3) Translocation of organic solutes (4) Food storage

8.# The diagram given below is a transverse section of **(4th NSEB)**



(1) Monocot root (2) Monocot stem (3) Dicot root (4) Dicot stem

9. Pericycle of roots is the site of origin of **(FINBO)**

(1) Lateral roots (2) Secondary meristems

(3) Cork cambium (4) All of the above

10. Which of the following cells can divide? **(NSEB-2012)**

(1) Scleride (2) Sieve cell (3) Phellogen cell (4) Xylem tracheid

11. If you put a nail at the middle of a young plant and allow it to grow, then: **(KVPY 2007)**

(1) You will find the nail at the same position after the tree is fully grown

(2) The nail will fall out

(3) The nail will rise along with the tree

(4) The nail will come closer to the ground

12. Colonization of land by plants was associated with the evolution of structures of obtain water and to minimize water loss. Which of the following adaptation are associated with the later?

i. Development of epidermis with waxy cuticle. **(NSEB-stage-1_2016-17)**

ii. Development of stomata with elaborate opening and closing mechanism.

iii. Development of bark on old stem and roots.

(1) i and ii only (2) i only (3) ii and iii only (4) i, ii and iii

13. A botanist collected leaf specimen from two different plants (I and II). He then took transverse sections of both the specimens, stained and observed them under the microscope. The observations are tabu lated below. **(NSEB-stage-1_2016-17)**

Leaf from plant	Stomata on		Cuticle		Air spaces
	Upper epidermis	Lower epidermis	Upper epidermis	Lower epidermis	
I	Present	Absent	Present	Absent	Present
II	Absent	Present	Present	Present	Absent

The plants I and II could respectively represent:

(1) Xerophyte and Mesophyte (2) Xerophyte and Floating hydrophyte

(3) Mesophyte and Submerged hydrophyte (4) Floating hydrophyte and Xerophyte

Exercise-3

PART - I : NEET / AIPMT QUESTION (PREVIOUS YEARS)

1. Raphides are found in **(AIPMT-2000)**
(1) Citrus (2) Colocasia (3) Nerium (4) Both 1 and 2

2. P-protein is found in **(AIPMT-2000)**
(1) Parenchyma (2) Collenchyma (3) Sieve tube (4) Xylem

3. Which of the following is primary meristem **(AIPMT-2000)**
(1) Plerome (2) Protoderm (3) Intercalary meristem (4) All

4. Tracheids are **(AIPMT-2000)**
(1) Elongated cells with tapering ends and unperforated end walls
(2) Elongated cells with tapering ends and perforated end wall
(3) Rounded cells with lignified walls
(4) Both (1) and (2)

5. Interxylary phloem formed in Salvadora due to abnormal secondary growth is also known as **(AIPMT-2000)**
(1) Included phloem (2) Internal phloem (3) External phloem (4) Vestigial phloem

6. Cambium found in vascular bundles of dicot stem is **(AIPMT-2000)**
(1) Intercalary meristem (2) Fasicular cambium
(3) Secondary meristem (4) All of the above

7. Pectin deposited in plant cell walls is **(AIPMT-2001)**
(1) excretory product (2) secretory product (3) both above (4) never deposited

8. The terminal and axillary buds arise from **(AIPMT-2002)**
(1) Apical meristem (2) intercalary meristem (3) lateral mristem (4) Parenchyma

9. Four radial vascular bundles are formed in **(AIPMT-2002)**
(1) monocot root (2) dicot root (3) monocot stem (4) dicot stem

10. Vessels are found in **(AIPMT-2002)**
(1) All angiosperms
(2) Most angiosperms few gymnosperms and few pteridophytes
(3) All angiosperms and few gymnosperms
(4) Most angiosperms and few gymnosperms

11. Which of the following is true about tracheids and vessels **(AIPMT-2002)**
(1) Tracheids are multicellular with narrow lumen
(2) Tracheids are unicellular with wide lumen
(3) Vessels are multicellular with wide lumen
(4) Vessels are unicellular with narrow lumen

12. The cells of the quiescent center are characterized by **(AIPMT-2003)**

(1) having dense cytoplasm and prominent nuclei
(2) having light cytoplasm and small nuclei
(3) dividing regularly to add to the corpus
(4) dividing regularly to add to tunica

13. In a longitudinal section of a root, starting from the tip upward, the four zones occur in the following order-
(1) Root cap, cell division,cell enlargement,cell maturation. **(AIPMT-2004)**
(2) Root cap, cell division, cell maturation,cell enlargement.
(3) Cell dIvision,cell enlargement,cell maturation,root cap.
(4) Celldivision, cell maturation,cell enlargement,root cap.

14. Common feature in vessel elements and sieve tube elements is **(AIPMT-2006)**
(1) Enucleate condition (2) Presence of P-protein
(3) Thick secondary wall (4) Pores on lateral walls.

15. Secondary growth is best obseved in **(AIPMT-2007)**
(1) Teak and Pine (2) Deodar and Fern
(3) Wheat and maiden Hair Fern (4) Sugarcane and Sunflower.

16. Passage cells are thin walled cells found in **(AIPMT-2007)**
(1) Phloem elements to serve as entry points
(2) Testa of seeds for emergence of embryonal axis
(3) Central area of style for passage of pollen tube
(4) Endodermis of roots to facilitate rapid transport of water from cortex to pericycle.

17. The length of different internodes in a culm of sugarcane is variable because of **(AIPMT-2008)**
(1) Size of leaf lamina at the node below each internode
(2) Intercalary meristem
(3) Shoot apical meristem
(4) Position of axillary buds.

18. Vascular tissue in flowering plants develops from **(AIPMT-2008)**
(1) Dermatogen (2) Plerome (3) Periblem (4) Phellogen.

19. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is **(AIPMT-2009)**
(1) differentiating (2) maturing (3) elongating (4) widening

20. In barley stem vascular bundles are **(AIPMT-2009)**
(1) closed and radial (2) open and scattered
(3) closed and scattered (4) open and in a ring

21. Palisade parenchyma is absent in leaves of **(AIPMT-2009)**
(1) Gram (2) Sorghum (3) Mustard (4) Soybean

22. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by
(1) Position of protoxylem (2) absence of secondary xylem
(3) Absence of secondary phloem (4) Presence of cortex. **(AIPMT-2009)**

23. Heart wood differs from sapwood in **(AIPMT-2010)**
(1) Absence of vessels and parenchyma (2) Having dead and non-conducting elements

(3) Being susceptible to pests and pathogens (4) Presence of rays and fibres

24. Which one of the following is not a lateral meristem **(AIPMT-2010)**
(1) Interfascicular cambium (2) Phellogen
(3) Intercalary meristem (4) Intrafascicular cambium

25. In land plants, the guard cells differ from other epidermal cells in having **(AIPMT Pre.-2011)**
(1) Cytoskeleton (2) Mitochondria
(3) Endoplasmic reticulum (4) Chloroplasts

26. The cork cambium, cork and secondary cortex are collectively called **(AIPMT Pre.-2011)**
(1) Phelloderm' (2) Phelloqen '. (3) Periderm (4) Phellem

27. Some vascular bundles are described as open because these **(AIPMT mains-2011)**
(1) are surrounded by pericycle but no endodermis
(2) are capable of producing secondary xylem and phloem
(3) possess conjunctive tissue between xylem and phloem
(4) are not surrounded by pericycle

28. In Kranz anatomy, the bundle sheath cells have **(AIPMT mains-2011)**
(1) Thin walls, many intercellular spaces and no chloroplasts
(2) Thick walls, no intercellular spaces and large number of chloroplasts
(3) Thin walls, no intercellular spaces and several chloroplasts
(4) Thick walls, many intercellular spaces and few chloroplasts

29. Which part would be most suitable for raising virus-free plants for micropropagation? **(AIPMT Pre.-2012)**
(1) Bark (2) Vascular tissue (3) Meristem (4) Node

30. Companion cells are closely associated with **(AIPMT Pre.-2012)**
(1) Sieve elements (2) Vessel elements (3) Trichomes (4) Guard cells

31. Closed vascular bundles lack **(AIPMT Pre.-2012)**
(1) Ground tissue (2) Conjunctive tissue (3) Cambium (4) Pith

32. Water containing cavities in vascular bundles are found in **(AIPMT Pre.-2012)**
(1) Sunflower (2) Maize (3) Cycas (4) Pinus

33. Gymnosperms are also called soft wood spermatophytes because they lack **(AIPMT Pre.-2012)**
(1) Cambium (2) Phloem fibres
(3) Thick-walled tracheids (4) Xylem fibres

34. The common bottle cork is a product of **(AIPMT Pre.-2012)**
(1) Dermatogen (2) Phellogen (3) Xylem (4) Vascular Cambium

35. As compared to a dicot root, a monocot root has **(AIPMT Mains-2012)**
(1) More abundant secondary xylem (2) Many xylem bundles
(3) Inconspicuous annual rings (4) Relatively thicker periderm

36. Age of a tree can be estimated by : **(NEET-2013)**
(1) biomass (2) number of annual rings
(3) diameter of its heartwood (4) its height and girth

37. Interfascicular cambium develops from the cells of: **(NEET-2013)**
(1) Xylem parenchyma (2) Endodermis (3) Pericycle (4) Medullary rays

38. You are given a fairly old piece of dicot stem and a dicot root. Which of the following anatomical structures will your use to distinguish between the two **(AIPMT-2014)**
(1) Secondary xylem (2) Secondary phloem (3) Protoxylem (4) Cortical cells

39. Tracheids differ from the tracheary elements in **(AIPMT-2014)**
(1) Having casparian strips (2) Being imperforate
(3) Lacking nucleus (4) Being lignified

40. A major characteristic of the monocot root is the presence of **(AIPMT-2015)**
(1) Scattered vascular bundles
(2) Vasculature without cambium
(3) Cambium sandwiched between phloem and xylem along the radius
(4) Open vascular bundles

41. Vascular bundles in Monocotyledons are considered closed because **(AIPMT-2015)**
(1) Cambium is absent (2) There are no vessels with perforations.
(3) Xylem is surrounded all around by phloem (4) A bundle shealth surrounds each bundle

42. Read the different components from (a) to (d) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem
(a) Secondary cortex **(Re-AIPMT-2015)**
(b) Wood
(c) Secondary phloem
(d) Phellem
The correct order is:
(1) (a), (b), (d), (c) (2) (d), (a), (c), (b) (3) (d), (c), (a), (b) (4) (c), (d), (b), (a)

43. Cotyledon of maize grain is called : **(NEET-I-2016)**
(1) scutellum (2) Plumule (3) coleorhiza (4) coleoptile

44. Specialised epidermal cells surrounding the guard cells are called : **(NEET-I-2016)**
(1) Lenticels (2) Complementary cells
(3) Subsidiary cells (4) Bulliform cells

45. Cortex is the region found between **(NEET-II-2016)**
(1) endodermis and vascular bundle (2) epidermis and stele
(3) pericycle and endodermis (4) endodermis and pith

46. The balloon-shaped structures called tyloses **(NEET-II-2016)**
(1) are linked to the ascent of sap through xylem vessels
(2) originate in the lumen of vessels
(3) characterize the sapwood
(4) are extensions of xylem parenchyma cells into vessels

47. Identify the worng statement in context of heartwood **(NEET-2017)**
(1) Organic compounds are deposited in it
(2) It is highly durable
(3) It conducts water and minerals efficiently

(4) It comprises dead elements with highly lignified walls

48. Which of the following is made up of dead cells **(NEET-2017)**
(1) Xylem parenchyma (2) Collenchyma (3) Phellem (4) Phloem

49. The vascular cambium normally gives rise to **(NEET-2017)**
(1) Phelloderm (2) Primary phloem (3) Secondary xylem (4) Periderm

50._ Stomata in grass leaf are **(NEET-2018)**
(1) Dumb-bell shaped (2) Barrel shaped (3) Rectangular (4) Kidney shaped

51._ Casparian strips occur in **(NEET-2018)**
(1) Epidermis (2) Endodermis (3) Cortex (4) Pericycle

52._ Secondary xylem and secondary phloem in dicot stem are produced by **(NEET-2018)**
(1) Apical meristems (2) Axillary meristems (3) Phellogen (4) Vascular cambium

53._ Plants having little or no secondary growth are **(NEET-2018)**
(1) Grasses (2) Cycads (3) Conifers (4) Deciduous angiosperms

54. Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following: **(NEET-1-2019)**
(1) Tyloses in vessels (2) Closure of stomata
(3) Flaccidity of bulliform cells (4) Shrinkage of air spaces in spongy mesophyll

55. Phloem in gymnosperms lacks : **(NEET-1-2019)**
(1) Both sieve tubes and companion cells (2) Albuminous cells and sieve cells
(3) Sieve tubes only (4) Companion cells only

56. Which of the statements given below is not true about formation of Annual Rings in trees? **(NEET-1-2019)**
(1) Annual rings are not prominent in trees of temperate region.
(2) Annual ring is a combination of spring wood and autumn wood produced in a year.
(3) Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively.
(4) Activity of cambium depends upon variation in climate.

57. In the dicot root the vascular cambium originates from : **(NEET-2-2019)**
(1)Tissue located below the phloem bundles and a portion of pericycle tissue above protoxylem.
(2) Cortical region
(3) Parenchyma between endodermis and pericycle
(4) Intrafascicular and interfascicular tissue in a ring

58. Regeneration of damaged growing grass following grazing is largely due to : **(NEET-2-2019)**
(1) Lateral meristem (2) Apical rneristem
(3) Intercalary meristem (4) Secondary meristem

PART - II : AIIMS QUESTION (PREVIOUS YEARS)

1. Angiosperms have **(AIIMS-2000)**
(1) Tracheids only (2) Vessels only (3) Sieve tubes only (4) Vessels and tracheids

2. In a dicotyledonous stem, the sequence of tissues from the outside to the inside is **(AIIMS-2003)**
(1) phellem - pericycle - endodermis - phloem (2) phellem - phloem - endodermis - pericycle
(3) phellem - endodermis - pericycle - phloem (4) peri cycle - phellem - endodermis - phloem

3. The quiescent centre in root meristem serves as a **(AIIMS-2003)**
(1) site for storage of food which is utilized during maturation
(2) reservoir of growth hormones
(3) reserve for replenishment of damaged cells of the meristem
(4) region for absorption of water

4. In a plant organ which is covered by periderm and in which the stomata are absent, some gaseous exchange still takes place through **(AIIMS-2004)**
(1) aerenchyma (2) trichomes (3) pneumatophores (4) lenticels

5. Companion cells in plants are associated with **(AIIMS-2004)**
(1) vessels (2) sperms (3) sieve elements (4) guard cells

6. Cork cambium results in the formation of cork which becomes impermeable to water due to the accumulation of **(AIIMS-2004)**
(1) resins (2) suberin (3) lignins (4) tannins

7. Sugarcane plant has **(AIIMS-2004)**
(1) Reticulate venation (2) Capsular fruits
(3) Pentamerous flowers (4) Dumb-bell shaped guard cells

8. Which one of the following statement pertaining to plant structure is correct **(AIIMS-2005)**
(1) Cork lacks stomata but lenticels carry out transpiration
(2) Passage cells help in transfer of food from cortex to phloem
(3) Sieve tube elements possess cytoplasm but no nuclei
(4) The shoot apical meristem has a quiescent centre.

9. In sieve elements, the possible function of P-proteins is **(AIIMS-2006)**
(1) Autolytic enzymes
(2) Sealing mechanism on wounding
(3) Providing energy for active translocation
(4) Deposition of callose on sieve plates.

10. Grafting is successful in dicots but not in monocots because the dicots have **(AIIMS-2006)**
(1) vascular bundles arranged in a ring
(2) cambium for secondary growth
(3) vessels with elements arranged end to end
(4) cork cambium

11. Ectophloic siphonostele is found in **(AIIMS-2008)**
(1) Osmunda and Equisetum (2) Marsilea and Botrychium
(3) Adiantum and Cucurbitaceae (4) Dicksonia and Maidenhair fern

12. Chlorenchyma is known to develop in the **(AIIMS-2008)**
(1) cytoplasm of Chlorella (2) mycelium of a green mould such as Aspergillus
(3) spore capsule of a moss (4) pollen tube of Pinus

13. Bark refers to **(AIIMS-2009)**

(1) phellem + phellogen + phelloderm (2) periderm + cortex
(3) phellem + phelloderm + secondary phloem (4) periderm + cortex + pericycle + secondary phloem

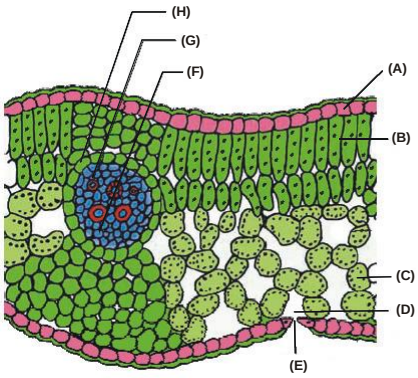
14. The branched sclereids present in hydrophytes are **(AIIMS-2009)**
(1) osteosclereids (2) trichosclereids (3) macrosclereids (4) astrosclereids.

15. Why are vascular bundles closed in monocots? **(AIIMS-2010)**
(1) xylem and phloem are present
(2) xylem and phloem occur in separate bundles
(3) vascular cambium is present between xylem and phloem
(4) vascular cambium is not present

16. If a stem is girdled **(AIIMS-2012)**
(1) Root dies first (2) Shoot dies first
(3) Both die together (4) None of the above would die

17. Which of the following statement(s) is /are true? **(AIIMS-2013)**
(A) Uneven thickening of cell wall is characteristic of sclerenchyma
(B) Periblem forms cortex of the stem and the root.
(C) Tracheids are the chief water transporting elements in gymnosperms
(D) Companion cell is devoid of nucleus at maturity.
(E) The commercial cork is obtained from *Quercus suber*.
(1) A and D only (2) B and E only (3) C and D only (4) B,C and E only

18. T.S. of dicot leaf passing through the midrib is given below, certain parts have been indicated by alphabets. Choose the correct option. **(AIIMS-2015)**



(1) A - Epidermis, B - Spongy parenchyma, C - Palisade parenchyma, D - Stomata, EGuard cells, F- Phloem, G - Metaxylem, H-Protoxylem .
(2) A - Epidermis, B - Palisade parenchyma, C - Spongy parenchyma, D - Sub-stomatal cavity, E - Stoma, F - Phloem, G -Metaxylem, H - Bundle sheath
(3) A - Epidermis, B - Palisade parenchyma, C - Spongy parenchyma, D - Stomata, E-Guard cells, F- Epidermis, G - Xylem, HPhloem
(4) A - Epidermis, C - Palisade parenchyma, C - Spongy parenchyma, D - Stomata, E -Guard cells, F- Phloem, G - Metaxylem, H- Protoxylem

19. Meristematic tissue responsible for increase in girth of tree trunk is **(AIIMS-2016)**
(1) Apical meristem (2) Intercalary meristem
(3) Lateral meristem (4) Phellogen

Answers

EXERCISE - 1

SECTION - A

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

SECTION - B

1.	(2)	**2.**	(4)	**3.**	(3)	**4.**	(4)	**5.**	(4)	**6.**	(2)	**7.**	(1)
8.	(1)	**9.**	(3)	**10.**	(2)	**11.**	(1)	**12.**	(2)	**13.**	(2)	**14.**	(3)
15.	(3)	**16.**	(3)	**17.**	(4)	**18.**	(3)	**19.**	(4)	**20.**	(4)	**21.**	(3)
22.	(1)	**23.**	(1)										

SECTION - C

1.	(2)	**2.**	(1)	**3.**	(3)	**4.**	(1)	**5.**	(1)	**6.**	(4)	**7.**	(3)
8.	(4)	**9.**	(1)	**10.**	(2)	**11.**	(2)	**12.**	(3)	**13.**	(1)	**14.**	(4)
15.	(2)	**16.**	(4)										

SECTION - D

1.	(4)	**2.**	(3)	**3.**	(2)	**4.**	(3)	**5.**	(3)	**6.**	(2)	**7.**	(4)
8.	(2)	**9.**	(2)	**10.**	(2)	**11.**	(2)	**12.**	(3)	**13.**	(2)	**14.**	(2)
15.	(1)	**16.**	(4)	**17.**	(4)	**18.**	(2)	**19.**	(3)	**20.**	(3)	**21.**	(4)
22.	(1)	**23.**	(3)	**24.**	(3)	**25.**	(1)	**26.**	(4)	**27.**	(4)	**28.**	(3)
29.	(4)	**30.**	(3)	**31.**	(1)	**32.**	(2)	**33.**	(1)	**34.**	(4)	**35.**	(3)
36.	(3)	**37.**	(1)	**38.**	(2)	**39.**	(2)	**40.**	(3)	**41.**	(1)	**42.**	(2)
43.	(2)	**44.**	(3)										

MISCELLANEOUS QUESTIONS

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

EXERCISE - 2

1.	(2)	**2.**	(1)	**3.**	(3)	**4.**	(1)	**5.**	(4)	**6.**	(2)	**7.**	(3)
8.	(1)	**9.**	(4)	**10.**	(3)	**11.**	(1)	**12.**	(1)	**13.**	(4)		

EXERCISE - 3

PART- I

1.	(1)	**2.**	(3)	**3.**	(4)	**4.**	(1)	**5.**	(1)	**6.**	(2)	**7.**	(2)
8.	(1)	**9.**	(2)	**10.**	(2)	**11.**	(3)	**12.**	(2)	**13.**	(1)	**14.**	(1)
15.	(1)	**16.**	(4)	**17.**	(2)	**18.**	(2)	**19.**	(1)	**20.**	(3)	**21.**	(2)
22.	(1)	**23.**	(2)	**24.**	(3)	**25.**	(4)	**26.**	(3)	**27.**	(2)	**28.**	(2)
29.	(3)	**30.**	(1)	**31.**	(3)	**32.**	(2)	**33.**	(4)	**34.**	(2)	**35.**	(2)
36.	(2)	**37.**	(4)	**38.**	(3)	**39.**	(2)	**40.**	(2)	**41.**	(1)	**42.**	(2)
43.	(1)	**44.**	(3)	**45.**	(2)	**46.**	(4)	**47.**	(3)	**48.**	(3)	**49.**	(3)
50.	(1)	**51.**	(2)	**52.**	(4)	**53.**	(1)	**54.**	(3)	**55.**	(1)	**56.**	(1)
57.	(1)	**58.**	(3)										

PART- II

1.	(4)	**2.**	(3)	**3.**	(3)	**4.**	(4)	**5.**	(3)	**6.**	(2)	**7.**	(4)
8.	(3)	**9.**	(2)	**10.**	(2)	**11.**	(1)	**12.**	(3)	**13.**	(4)	**14.**	(4)
15.	(4)	**16.**	(1)	**17.**	(4)	**18.**	(2)	**19.**	(3)				

Self Practice Paper (SPP)

1. Palisade parenchyma is absent in leaves of
(1) Gram (2) Sorghum (3) Mustard (4) Soybean

2. Which one of the following is not a lateral meristem?

(1) Interfascicular cambium (2) Phellogen
(3) Intercalary meristem (4) Intrafascicular cambium

3. Annual rings are the bands of
(1) Secondary cortex and cork (2) All secondary vascular tissue
(3) Secondary xylem and xylem rays (4) Secondary phloem and medullary rays

4. Periderm includes-
(1) Phellem, Phelloderm, Plerome (2) Phellem, Phellogen, Dermatogen
(3) Phellem, Phellogen, Phelloderm (4) Phellem, Phellogen, Cortex

5. Water containing cavities in vascular bundles are found in:
(1) Sunflower (2) Maize (3) Cycas (4) Pinus

6. Cambial cells divide
(1) Vertically (2) Anticlinally (3) Tangentially (4) Obliquely

7. Fascicular cambium in dicot vascular bundles is-
(1) Primary cambium (2) Secondary meristem
(3) Intercalary meristem (4) Non-meristematic

8. Meristematic activities are best seen in
(1) Cambial meristem (2) Root and shoot apices
(3) All leaf tips (4) All of these

9. Meristem which produces vascular bundles is
(1) Procambium (2) Lateral meristem
(3) Secondary meristem (4) Mass meristem

10. During secondary growth in Dicot root, the vascular cambium is formed by
(1) Cortex (2) Endodermis
(3) Pericycle & Conjunctive tissue (4) Outer layer of cortex

11. Marginal meristem occurs in
(1) Shoot apex (2) Root apex (3) Fruits (4) Leaves

12. Multilayered root cap is present in
(1) Eichhornia (2) Parthenium (3) Pandanus (4) Ficus

13. The chief function fo Medullary rays is
(1) Radial conduction of water & food (2) To provide mechanical support to the plant
(3) Transport of sugars (4) To provide flexibility to the plant

14. Examples of dead cells are

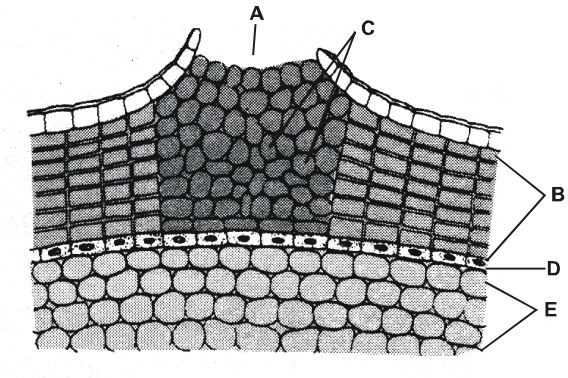
(1) Stone cells, sclerotic cells, sclerenchyma fibres and cork cells

(2) Velemen cells, cork cells, collenchyma cells, xylem tracheids and vessels

(3) Xylem tracheids, vessels, fibres and xylem parenchyma

(4) All of hte above.

15.#



Find out the correct option having correct labelling of above diagram

(1) A = Lenticel, B = Cork cambium, C = Complementary cells, D = Cork, E = Phelloderm

(2) A = Stomata, B = Cork, C = Cork cambium D = Secondary cortex, E = Cortex

(3) A = Lenticel, B = Phellem, C = Complementary cells, D = Phellogen, E = Phelloderm

(4) A = Lenticel, B = cork, C = Parenchyma d = Cork cambium, E= Secondary cortex

16. Tracheary elements are devoid of

(1) Cytosol (2) Suberization (3) Protoplast (4) All of these

17. Callose pads develop in

(1) Companion cells (2) Sieve plates

(3) Phloem parenchyma (4) Phloem fibres

18. Xylem vessels are not found in

(1) Gnetum and Ephedra (2) Angiosperms

(3) All gymnosperms (4) Cycads and conifers

19. Vessels have

(1) Transverse septa (2) Lonigtudinal septa

(3) Oblique septa (4) No septa

20. Centrifugal development of xylem is found in

(1) Stem (2) Root (3) Petiole (4) None of these

21. Laticiferous cells are found in

(1) Vinca and Nerium (2) Carica papaya

(3) Hevea braziliensis (4) All of these

22. Match the column

Column-I	Column-II
(i) Ring bark	(a) Late wood
(ii) Complementary cells	(b) Heart wood
(iii) Smaller, darker and narrow xylem elements.	(c) Vessels in abundance
(iv) Duramen	(d) Eucalyptus
(v) Hard wood	(e) Loosly arranged suberised cells of lenticals.

(1) i - d ii - e iii - a iv - b v - c (2) i - e ii - d iii - b iv - a v - c
(3) i - e ii - a iii - d iv - c v - b (4) i - a ii - e iii - b iv - d v - c

23. Radial translocation of organic solutes is facilitated by
(1) Medullary rays (2) Wide pith (3) Wide cortex (4) Well developed phloem

24. Conjoint, collateral and closed vascular bundles with xylem endarch is found in
(1) Cucurbita stem (2) Helianthus stem (3) Maize stem (4) Vanda root

25. Sclerenchymatous bundle caps are found in stem of
(1) Zea mays (2) Cucurbita (3) Helianthus (4) Boerhaavia

26. Bundle sheath is parenchymatous in
(1) Vascular bundles of C-4 plant leaves (2) Monocot leaves
(3) Dicot stem (4) Dicot leaves

27. Match the wall components listed under **column-I** with the type of tissues/tissue systems listed under **column-II** choose the answer which gives the correct combination of the alphabetes

Column-I (Wall components)	Column-II (Tissue / tissue system)
(A) Suberin	P. Sclerenchyma
(B) Lignin	q. Collenchyma
(C) Pectin	r. Epidermis
(D) Cutin	s. Phellem
	t. Parenchyma

(1) A = s, B = t, C = p, D = r (2) A = s, B = t, C = q, D = r
(3) A = s, B = p, C = q, D = r (4) a = s, B = q, c = p, D = r

28. The casparian strip is usually composed of
(1) Lignin (2) Pectin (3) Cutin (4) Suberin

29. Dumbbell shaped guard cells are found in
(1) Zea (2) Allium (3) Nerium (4) Cucurbita

30. The unthickened cells of endodermis are
(1) Cambial cells (2) Passage cells (3) Both of these (4) None of these

31. When xylem is surrounded by phloem on all sides, the vascular bundle is called
(1) Amphivasal (2) Leptocentric (3) Radial (4) Amphicribal

32. All the tissues except epidermis and vascular bundles constitute the
(1) Cortex (2) Ground tissue (3) Conjunctive tissue (4) Medullary rays

33. A parenchyma cell which stores ergastic materials or waste substance is
(1) Phragmoblast (2) Conidioblast

(3) Idiobast (4) Blastomere

34. Amphivasal vascular bundles are found in
(1) Cycas and Dryopteris (2) Dracaena and Yucca
(3) Helianthus and Cucurbita (4) Maize and wheat

35. Sclerenchymatous bundle sheath is present in
(1) Grass (2) Sunflower
(3) Banyan (4) Gram

36. Pith is not well developed in
(1) Monocot stem (2) Monocot root
(3) Dicot Stem (4) Dicot root

37. Polyarch and exarch vascular bundles are the characteristic of
(1) Dicot stem (2) Dicot root
(3) Monocot stem (4) Monocot root

38. Position of protoxylem & phloem in leaf respectively
(1) Abaxial & Adaxial (2) Adaxial & Abaxial
(3) Both Adaxial (4) Both abaxial

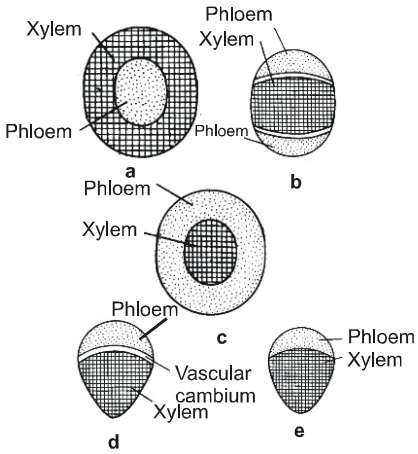
39. Outer layer of bark is
(1) Epidermis (2) Rhytidome
(3) Phellloderm (4) Lenticel

40. Which tissue remains more active during autumn?
(1) Vascular cambium (2) Cork cambium
(3) Parenchyma (4) Sclerenchyma

41. Sap wood differ from heart wood in being
(1) Darker and non-conducting
(2) Softer and non-conducting
(3) Lighter and conducting
(4) Hard, darker and less conducting

42. Read the following statements
(a) The youngest layer of phloem lies just outside the cork cambium
(b) Sapwood is functional part of the secondary xylem or wood
(c) Nonporaous wood is hard wood that is found in angiospermic plants
(d) Annuals rings are absent in dicot root after secondary growth due to little seasonal variation in soil temperature
Pick up the correct statements
(1) a & c (2) b & c (3) a & d (4) b & d

43.#



Select the correct option having correct labelling in above diagram.

(1) a = Amphicribal, b = Bicollateral, c = Amphivasal, d = collateral, closed, e = collateral open

(2) a = conjoint, b = collateral, c = concentric, d = ectophloic & open, e = ectophloic & closed.

(3) a = Amphivasal, b = Bicollateral, C = Amphicribal, d = collateral & open, e = collateral & closed.

(4) a = Amphicribal, b = collateral, c = Amphivasal, d = Concentric & open, e = conjoint & closed.

44. Which of the following statements pertaining to plant structure is correct.

(1) The cells of Quiesant centre are usually active and divide.

(2) Cork lacks stomata but lenticels carry out transpiration.

(3) Passage cells help to transfer of food from cortex to phloem.

(4) In grasses, the plant parts removed by the grazing herbvores regenerate due to activity of intercalary meristem.

45. Albuminous cells are found in the phloem of

(1) Monocot (2) Dicot (3) Gymnosperms (4) Bryophytes

SPP Answers

1.	(2)	**2.**	(3)	**3.**	(3)	**4.**	(3)	**5.**	(2)	**6.**	(3)	**7.**	(1)
8.	(4)	**9.**	(1)	**10.**	(3)	**11.**	(4)	**12.**	(3)	**13.**	(1)	**14.**	(1)
15.	(3)	**16.**	(4)	**17.**	(2)	**18.**	(4)	**19.**	(4)	**20.**	(1)	**21.**	(1)
22.	(1)	**23.**	(1)	**24.**	(3)	**25.**	(3)	**26.**	(4)	**27.**	(3)	**28.**	(4)
29.	(1)	**30.**	(2)	**31.**	(4)	**32.**	(2)	**33.**	(3)	**34.**	(2)	**35.**	(1)
36.	(4)	**37.**	(4)	**38.**	(2)	**39.**	(2)	**40.**	(2)	**41.**	(3)	**42.**	(4)
43.	(3)	**44.**	(4)	**45.**	(3)								