6 Anatomy of Flowering Plants

Conceptual MCQs

1. Maximum growth in root occurs
(a) at its tip. (b) towards light.
(c) behind the apex. (d) towards apex.

2. Read the following statements regarding meristematic cells and select the **correct** ones.
(i) Cells possess the ability to grow and divide.
(ii) Cells have dense cytoplasm with prominent nucleus.
(iii) Well developed ER and mitochondria are present.
(a) (i) and (ii) (b) (ii) and (iii)
(c) (i) and (iii) (d) (i), (ii) and (iii)

3. Leaf primordium grows into adult lamina by means of:
(a) Marginal meristem
(b) Lateral meristem
(c) First apical and then marginal meristems
(d) Apical meristem

4. A living mechanical tissue having pecto-cellulosic wall thickening is :
(a) Sclerenchyma (b) Collenchyma
(c) Parenchyma (d) Aerenchyma

5. The living and non-lignified component of vascular tissue is/are:
(a) Vessel and tracheid
(b) Vessel and phloem
(c) Wood fibre and phloem
(d) Wood parenchyma and sieve tube

6. The composition of stele is:
(a) Pith, vascular bundle
(b) Pericycle, pith
(c) Endodermis, pericycle
(d) Endodermis, pericycle, pith

7. A concentric amphivasal vascular bundle is that in which
(a) centrally located xylem is surrounded by phloem.
(b) centrally located phloem is surrounded by xylem.
(c) phloem is flanked by xylem on interior sides only.
(d) Both (b) and (c)

8. A bicollateral vascular bundle has the following arrangement of tissues.
(a) Outer phloem – outer xylem – middle cambium – inner xylem – inner phloem
(b) Outer cambium – Outer phloem – middle xylem – inner phloem – inner cambium
(c) Outer phloem – outer cambium – middle xylem – inner cambium – inner phloem
(d) Outer xylem – outer cambium – middle phloem – inner cambium – inner xylem

9. In _____ protoxylem lies towards periphery and metaxylem lies towards centre. Such an arrangement of primary xylem is called as _____.
(a) Stems, endarch (b) Stems, exarch
(c) Roots, endarch (d) Roots, exarch

10. Which one is **incorrect** about monocot stem?
(i) Vascular bundles are scattered, conjoint, close, surrounded by sclerenchymatous bundle sheath with water cavity.
(ii) Hypodermis is sclerenchymatous.
(iii) Peripheral vascular bundles are smaller than centrally placed ones.
(iv) Ground tissue is differentiated into cortex, pericycle, pith, etc.
(v) Homogeneous parenchymatous ground tissue.
(a) (i), (iii) and (v) (b) (iii) and (iv)
(c) Only (iv) (d) Only (v)

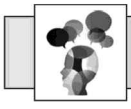
11. In an annual ring, the light coloured part is known as:
(a) Early wood (b) Late wood
(c) Heart wood (d) Sap wood

12. Most distinct annual rings are formed in :
(a) Tropical region
(b) Temperate region
(c) Arctic region
(d) Equatorial region

13. Study carefully the following statements and select the **incorrect** one(s).
(i) Lateral roots develop from pericycle.
(ii) Endodermis is the innermost layer of cortex.
(iii) Sapwood is the central, dark coloured, non-conducting part of secondary xylem.
(a) (i) and (ii) (b) (ii) and (iii)
(c) Only (i) (d) Only (iii)

14. Y- shaped arrangement of xylem vessels is found in:
(a) Monocot stem (b) Dicot stem
(c) Monocot root (d) Dicot root

15. Consider the following statements and choose the **correct** ones.
    (i) In a dicot root, the vascular bundles are collateral and endarch.
    (ii) The inner most layer of cortex in a dicot root is endodermis.
    (iii) In a dicot root, the phloem masses are separated from the xylem by parenchymatous cells that are known as the conjunctive tissue.
    (a) Only (i) (b) Only (ii)
    (c) (ii) and (iii) (d) (i) and (iii)
16. At maturity the sieve plates become impregnated with:
    (a) Cellulose (b) Pectin
    (c) Suberin (d) Callose
17. Radial vascular bundles characteristically occur in
    (a) monocot and dicot stems
    (b) monocot and dicot leaves
    (c) monocot and dicot roots
    (d) all of these.
18. Casparian strips are the bands of thickenings present on _____ walls of endodermis.
    (a) radial (b) tangential
    (c) central (d) both (a) and (b)
19. In a dorsiventral leaf, what is true regarding the position of xylem?
    (a) Xylem is towards adaxial epidermis.
    (b) Xylem is towards abaxial epidermis.
    (c) Xylem surrounds phloem.
    (d) Xylem is surrounded by phloem.
20. Lysigenous cavity in monocot stems vascular bundles develops by the dissolution of
    (a) protoxylem (b) metaxylem
    (c) phloem (d) ground tissue
21. Which of the following options correctly shows the sequence of different tissues of the periderm starting from periphery?
    (a) Phellogen → Phellem → Phelloderm
    (b) Phellem → Phelloderm → Phellogen
    (c) Phellem → Phellogen → Phelloderm
    (d) Phelloderm → Phellogen → Phellem
22. Bark formed early in the season is called as _____ bark and bark formed towards the end of the season is called as _____ bark.
    (a) hard, soft (b) soft, hard
    (c) scaly, ring (d) ring, scaly
23. In leaves, protoxylem elements
    (a) face towards adaxial side
    (b) face towards abaxial surface
    (c) are surrounded by metaxylem
    (d) are scattered in the middle
24. In dicot root, the cambium is
    (a) completely primary in origin
    (b) completely secondary in origin
    (c) primary as well as secondary in origin
    (d) derived from endodermis



Application Based MCQs

25. Bamboo, grass and mint stem elongate by the activity of :
    (a) Primary meristem (b) Secondary meristem
    (c) Intercalary meristem (d) Apical meristem
26. In dicot stem, starch sheath is equivalent to:
    (a) Pericycle (b) Endodermis
    (c) Bundle sheath (d) Bundle cap
27. Which will decay faster if exposed freely to the air?
    (a) Heartwood
    (b) Sapwood
    (c) Wood with lots of fibres
    (d) Soft wood
28. The trees, grow in deserts will
    (a) show alternate rings of xylem and sclerenchyma.
    (b) show distinct annual rings.
    (c) not show distinct annual rings.
    (d) have only conjunctive tissue and phloem formed by the activity of cambium.
29. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by
    (a) absence of secondary phloem.
    (b) presence of cortex.
    (c) position of protoxylem.
    (d) absence of secondary xylem.
30. Palisade parenchyma is absent in leaves of:
    (a) Mustard (b) Soyabean
    (c) Gram (d) Sorghum
31. In barley stem vascular bundles are :
    (a) Closed and scattered (b) Open and in a ring
    (c) Closed and radial (d) Open and scattered
32. Water containing cavities in vascular bundles are found in:
    (a) Sunflower (b) Maize
    (c) *Cycas* (d) *Pinus*
33. You are given a fairly old piece of dicot stem and a dicot root. Which of the following anatomical structures will you use to distinguish between the two?
    (a) Secondary xylem (b) Secondary phloem
    (c) Protoxylem (d) Cortical cells
34. Read the different components (A) to (D) given in the list below and identify 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 (B) Wood
    (C) Secondary phloem (D) Phellem
    (a) A, B, D, C (b) D, A, C, B
    (c) D, C, A, B (d) C, D, B, A

35. The given description refers to which one of the following options?
(i) Unicellular hair
(ii) Endodermis with the passage cells
(iii) Pith–small/inconspicuous
(iv) Radial vascular bundle
(v) Xylem exarch
(vi) 2–4 xylem and phloem
(a) Monocot root (b) Dicot root
(c) Monocot stem (d) Dicot stem

36. Which one of the following tissues represent the given characterstics?
(i) Occur as layers or patches.
(ii) Cell wall is unevenly thickened due to pectocellulosic deposition.
(iii) Cells are spherical, oval or polygonal.
(iv) Often has chloroplast.
(v) Living mechanical tissue.
(vi) Occurs in hypodermis of young dicot stem and petiole.
(a) Parenchyma
(b) Collenchyma
(c) Sclerenchyma
(d) Vascular tissue

37. How many growth rings will be developed per year in a plant, grown in Rajasthan with four distinct seasons (viz, summer, rainy, winter and spring) ?
(a) Four (b) Two
(c) One (d) None of these

38. Select the mismatched pair.
(a) Collateral and open vascular bundles – Sunflower stem
(b) Bicollateral vascular bundles – Maize stem
(c) Concentric vascular bundles – Ferns
(d) Radial vascular bundles – Maize root

39. Read the following statements.
(i) Multicellular epidermal hair
(ii) Collenchymatous hypodermis
(iii) Pith present
(iv) Vascular bundles present in a ring *i.e.,* eustele
Above given features describe which of the following plant parts?
(a) Monocot stem (b) Monocot root
(c) Dicot stem (d) Dicot root

40. **(A):** Anatomically, all the tissues present on the inner side of endodermis such as pericycle, vascular bundles and pith constitute the stele.
(B): Eustele is the stele in which vascular bundles are arranged in the form of a ring as is present in dicot stems.
(a) Both (A) and (B) are true.
(b) (A) is true but (B) is false.
(c) Both (A) and (B) are false.
(d) (A) is false but (B) is true.

41. Following table summarises the differences between a monocot root and a dicot root.

	Characters	Monocot root	Dicot root
(i)	Vascular bundles	Polyarch *i.e.,* more than 6 vascular bundles	Diarch to hexarch *i.e.,* 2 - 6 vascular bundles
(ii)	Cambium	Absent	Present, so secondary growth occurs
(iii)	Pith	Poorly developed	Well developed large pith
(iv)	Activity of pericycle	Gives rise to secondary roots and cork cambium	Gives rise to lateral roots only

Pick up the wrong differences and select the correct option.
(a) (i) and (iii) (b) (i) and (iv)
(c) (iii) and (iv) (d) (ii) and (iii)

42. Match Column-I with Column-II and select the correct option from the codes given below.

	Column-I	Column-II
A.	Bulliform cells	(i) Regulate opening and closing of stomata
B.	Guard cells	(ii) Aerating pores in the bark of plant
C.	Lenticels	(iii) Rolling in and out of leaves
D.	Subsidiary cells	(iv) Accessory cells

(a) A-(iii), B-(i), C-(ii), D-(iv)
(b) A-(i), B-(ii), C-(iii), D-(iv)
(c) A-(iv), B-(iii), C-(i), D-(ii)
(d) A-(ii), B-(iv), C-(iii), D-(i)

43. In a mature dicot stem which has undergone secondary growth, youngest layer of secondary xylem is situated
(a) in between pith and primary xylem
(b) just outside the vascular cambium
(c) just inner to the vascular cambium
(d) just inner to the phellogen

44. Xylem in angiosperms consists of how many types of elements?
(a) 4 (b) 3
(c) 2 (d) 1

45. Heterogeneous tissues are
(a) vascular and cork cambia
(b) xylem and phloem elements
(c) dermal layer and ground tissue
(d) parenchyma and sclerenchyma

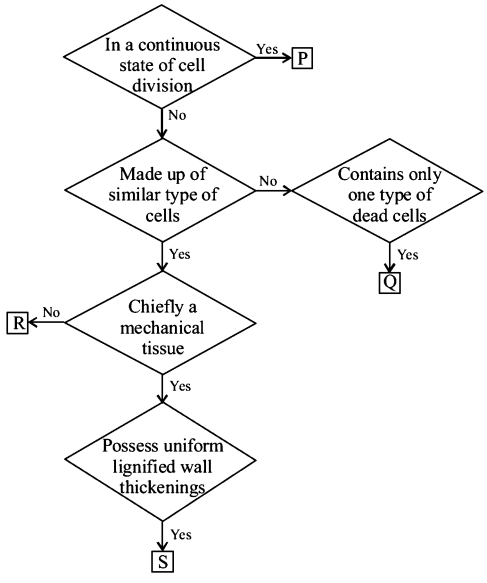
46. How many shoot apical meristematic zones are expected in twig of a plant possessing 9 branches and 39 leaves?
(a) 9 (b) 39
(c) 10 (d) 8

Skill Based MCQs

47. In a dorsiventral leaf, location of palisade tissue and phloem is respectively on the _____ surfaces.
(a) adaxial and abaxial (b) adaxial and adaxial
(c) abaxial and adaxial (d) abaxial and abaxial

48. Which of the following statements is incorrect?
(a) In a dicot stem, the pericycle is usually multilayered.
(b) Wood is the common name used for secondary xylem.
(c) Peripheral cytoplasm, a large vacuole and a prominent nucleus; all are absent in a mature sieve tube-element.
(d) Lenticels are the aerating pores present in bark of plants and are associated with gaseous exchange.

49. Study the flowchart given below.



Which of the following statements is incorrect regarding this?
(a) P can be root apical meristem which is generally subterminal in position.
(b) Q can be phloem which is also called bast.
(c) R can be parenchyma which comprises of thin walled isodiametric cells.
(d) S can be collenchyma which is a living mechanical tissue.

50. I. Multicellular with wide lumen
II. They consists of vertical rows of cell with cross walls dissolved
III. Discontinuous lumen due to presence of end walls
IV. They are dead
V. Cell walls are lignified
VI. Long, cylindrical tube-like structure
VII. Elongated cell with tapering ends
The above characteristics match with

	A. Vessel	B. Tracheid
(a)	A - I, II, IV, V, VI	B - III, IV, V, VII
(b)	A - III, IV, V, VII	B - I, II, IV, V, VI
(c)	A - I, IV, V, VII	B - III, II, IV, V, VII
(d)	A - I, II, III, IV	B - II, V, VI, VII

51. TS of dicot stem is stained with iodine with proper procedure. Which of the following is expected to show blue colour?
(a) Endodermis
(b) Hypodermis
(c) Pericycle
(d) Phloem

ANSWER KEY

Conceptual MCQs																			
1	(c)	**4**	(b)	**7**	(d)	**10**	(b)	**13**	(d)	**16**	(d)	**19**	(a)	**22**	(b)				
2	(a)	**5**	(d)	**8**	(c)	**11**	(a)	**14**	(a)	**17**	(c)	**20**	(a)	**23**	(d)				
3	(c)	**6**	(a)	**9**	(d)	**12**	(b)	**15**	(c)	**18**	(d)	**21**	(c)	**24**	(c)				
Application Based MCQs																			
25	(c)	**28**	(c)	**31**	(a)	**34**	(b)	**37**	(b)	**40**	(a)	**43**	(c)	**46**	(a)				
26	(b)	**29**	(c)	**32**	(b)	**35**	(b)	**38**	(b)	**41**	(c)	**44**	(a)						
27	(b)	**30**	(d)	**33**	(c)	**36**	(b)	**39**	(c)	**42**	(a)	**45**	(b)						
Skill Based MCQs																			
47	(a)	**48**	(c)	**49**	(d)	**50**	(a)	**51**	(a)										