Anatomy of Flowering Plants Important Questions With Answers

NEET Biology 2023

1. Heartwood differs from sapwood in:
   a) Being susceptible to pests and pathogens b) Presence of rays and fibres
   c) Absence of vessels and parenchyma d) Having dead and non-conducting elements
2. End walls of tracheids and vessels respectively are:
   a) Pitted & perforated b) Perforated & pitted c) Both perforated d) Both pitted
3. **Assertion :** Vascular bundles are conjoint, collateral and closed in dicot stem.
   Reason: Vascular bundles are conjoint, collateral and open in monocot stem.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) If assertion is true but reason is false. **d) If both assertion and reason are false.**

   Solution : -
   In dicot stem, each vascular bundle consists of phloem on the outer side, xylem towards the inner side and a strip of cambium in between the two. Phloem and xylem tissues lie on the same radius. Such vascular bundles are known as conjoint (with both phloem and xylem), collateral (phloem and xylem on the same radius) and open. In monocot stem, phloem lies towards the outside and the xylem on the inner side. Cambium is absent as the whole procambium is consumed in the formation of vascular tissues. The vascular bundles are, therefore, conjoint, collateral and closed.
4. **Assertion:** Secondary growth usually occurs in dicotyledonous stems.
   Reason: The vascular cambium present between xylem and phloem possesses the ability to form secondary xylem and secondary phloem respectively.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) If assertion is true but reason is false. d) If both assertion and reason are false.

   Solution : -
   Dicotyledonous stems usually show secondary growth in thickness, which is due to the activity of vascular cambium and cork cambium. Vascular cambium is present between phloem and xylem. Such vascular bundles because of the presence of cambium possess the ability to form secondary xylem and phloem tissues, and hence exhibit secondary growth.
5. Root hairs develop from the region of:
   a) Maturation b) Elongation c) Root cap d) Meristematic activity

   Solution : -
   In roots, the root hairs arise from zone of maturation which undergoes differentiation. Root hairs are unicellular elongations of the epidermal cells.
6. Annual rings are well demarcated in trees growing in
   a) Shimla b) Bombay/Delhi c) Madras d) Udaipur

7. Suberin in chiefly deposited in the cells of
   a) Sclerenchyma b) Collenchyma **c) Cork** d) Phelloderm
8. Gymnosperms are also called soft wood spermatophytes because they lack:
   a) Thick-walled tracheid **b) Xylem fibres** c) Cambium d) Phloem fibres
9. Angular collenchyma occurs in _____ .
   a) Cucurbita **b) Tagetes** c) Althaea d) Salvia

   Solution : -
   Depending upon the thickening, collenchyma is of three types - (a) Angular -thickening at the angles,e.g. stem of tomato, Datura, Tagetes (marigold), (b) Lamellar - thickening on tangential walls, e.g. stem of sunflower, (c) Lacunate-thickening on the walls bordering intercellular spaces, e.g. stem of Cucurbita.
10. The transverse section of a plant shows following anatomical features:
    a) Large number of scattered vascular bundles surrounded by bundle sheath.
    b) Large conspicuous parenchymatous ground tissue. **c) Vascular bundles conjoint and closed**
    d) Phloem parenchyma absent.

    Solution : -
    All anatomical features showing that plant is monocotyledonous stem. The monocot stem has vascular bundles near the outside edge of stem. Vascular bundles are scattered in parenchymatous ground tissue. There is no pith region in monocots. The vascular bundles are closed as they do not have cambium in it.
11. As the secondary growth takes place (proceeds) in a tree, thickness of _____ .
    a) Heartwood increases b) Sapwood increases c) Both increase d) Both remain the same

    Solution : -
    As a result of continuous secondary growth in 54. subsequent year, the older part of secondary xylem becomes non-functional. Due to this activities of vessels become blocked by bladder like ingrowths which are called tyloses. Due to this non-functional xylem becomes hard and blackish in colour called duramen or heartwood. Now, the function of secondary xylem is continoued try younger rings called sapwood or alburnum with the passage of time and addition of new outer rings of secondary xylem more rings of sapwood changes into heartwood. This is why the heartwood increases in diameter year after year but the sapwood remains almost in the same thickness.
12. Which of the following statements are correct about heartwood?
    (i) It does not help in water conduction.
    (ii) It is also called alburnum.
    (iii) It is light in colour and is very soft.
    (iv) It has tracheary elements which are filled with tannins, resins, ete.
    a) (ii) and (iv) b) (i), (ii) and (iii) c) (ii), (iii) and (iv) **d) (i) and (iv)**
13. Phellogen cuts off derivatives on the inner side to form _____and on the outer side to form_____.
    a) cork, secondary cortex **b) secondary cortex, cork** c) cork cambium, cork
    d) cork cambium, secondary cortex
14. In temperate regions, during spring season, cambium is very active and produces a large number of xylary elements having vessels with wider cavities. Wood formed in this way is called as
    a) spring wood b) autumn wood c) early wood **d) both (a) and (c).**
15. A meristem may be defined as the group of cells.
    a) Does not divide b) Conserve food **c) Divide continuously to give rise to the group of cells**
    d) Elongate, mature and add to the group of cells.
16. Position of xylem & phloem in leaf respectively
    a) Abaxial & Adaxial **b) Adaxial & Abaxial** c) Both Adaxial d) Both abaxial
17. Water containing cavities in vascular bundles are found in:

a) Sunflower **b) Maize** c) Cycas d) Pinus

Solution : -

Water containing cavities in vascular bundles are found in maize (zea mays). Maize is a monocot in which vascular bundles are conjoint, collateral and closed. Its lowermost protoxylem vessels and xylem parenchyma cells dissolve forming a water containing schizolysigenous cavity called protoxylem cavity or lysigenous cavity

18. The growth of roots and stems in length with the help of apical meristem is called
a) primary growth b) lateral growth c) secondary growth d) intercalary growth

19. Which statements is true?
a) Spring wood is darker in colour with higher density b) Autumn wood is lighter in colour with higher density
c) Autumn wood is darker in colour with lower density
d) Spring wood is lighter in colour with lower density

20. Stele includes
a) peri cycle b) vascular bundles c) pith **d) all of these.**

Solution : -

Word 'stele' is taken from Greek language, which means 'pillar'. Stele consists of pericycle, vascular bundles (xylem and phloem) and pith (if present).

21. Stomata which remain surrounded by a pair of subsidiary cells whose common wall is at right angles to guard cells are called
a) anomocytic b) anisocytic c) paracytic **d) diacytic.**

Solution : -

Diacytic (caryophyllaceous) type of stomata are surrounded by 2 subsidiary cells. Diacytic subsidiary cells are arranged at right angles to the stomata cells e.g., Saponaria.

22. Select the true statement:
a) Lenticels are absent in woody climbers leaves b) Lenticels occur in most woody trees
c) The spring wood is lighter in colour and has a long density d) The sap wood also called as duramen

23. Girdling experiment is not possible in maize and sugarcane because of
a) Scattered vascular bundles b) Open vasucular bundles c) Closed vascular bundles
d) Absence of pericycle

24. Thickenings in collenchyma is mainly due to deposition of-
a) Cellulose **b) Pectin** c) Lignin d) suberin

25. Read the following statements and select the correct option.
Statement 1 : Anatomically, all the tissues present on the inner side of endodermis such as pericycle, vascular bundles and pith constitute the stele.
Statement 2: Eustele is the stele in which vascular bundles are arranged in the form of a ring as present in dicot stems
a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.

26. Meristematic tissues are composed of
a) mature cells b) fully differentiated cells c) cells that cannot divide
d) immature cells with power to divide.

27. Match the following and choose the correct option from below.

A.	Meristem	-	(i)	Photosynthesis, storage
B.	Parenchyma	-	(ii)	Mechanical support

C.	Sollenchym	-	(iii)	Actively dividing cells
D.	Sclerenchyma	-	(iv)	Sclereids

a) A-(i), B-(iii), (-(v), D-(ii), E-(iv) **b) A-(iii), B-(i), (-(ii), D-(v), E-(iv)** c) A-(ii), B-(iv), (-(v), D-(i), E-(iii)
d) A-(v), B-(iv), (-(iii), D-(ii), Hi)

Solution : -

During reproductive phase of a shoot apex, the floral meristem broadens, becomes less conical and increases In size. This increase in size is due to an increase in rate of cell division in the central cells. In plants, floral morphogenesis is controlled by a network of genes.

28. Centripetal and centrifugal xylem are the important feature of
a) Root and stem xylem respectively b) Exarch and endarch xylem respectively
c) Endarch and exarch xylem respectively **d) Both (1) & (2)**

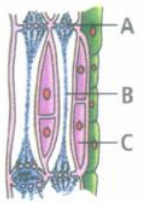
29. Select the mismatched pair out of the following.
a) Radial vascular bundle - Xylem and phloem on different radii
b) Bicollateral vascular bundle - Phloem present on both sides of xylem
c) Amphivasal vascular bundle - Phloem surrounds xylem
d) Conjoint vascular bundle - Xylem and phloem on same radii

Solution : -

In amphivasal or leptocentric vascular bundles, xylem surrounds phloem, e.g., Dracaena, Yucca

30. Root cap in monocots is formed by
a) dermatogen **b) calyptrogen** c) vascular cambium d) wound cambium.

31. Identify the given figure and select the correct option for the parts labelled as A, B and C.



a)
C represents the cells which are replaced by albuminous cells in non-flowering plants such as gymnosperms.
b) A represents phloem c) B represents the cells which become dead on maturity. d) All of these

Solution : -

In the given figure, companion cells are labelled as 'e. These cells are narrow, elongated and thin-walled living cells. They lie on the sides of sieve tubes and are closely associated with them through compound plasmodesmata. Companion cells are replaced by modified parenchyma cells (albuminous cells) in nonflowering plants. 'A' represents sieve plate and 'B' represents sieve tube cell.

32. Which one of the following is not a lateral meristem ?
a) Intercalary meristem b) Intrafascicular cambium c) nterfascicular cambium d) Phellogen

Solution : -

Lateral meristems are those which initiate secondary growth of plant organs, resulting in increase in thickness or girth. Vascular cambium and cork cambium are examples of lateral meristem.

33. **Assertion:** The wood is actually secondary xylem.
Reason : Secondary growth occurs in most of the monocot roots and stems.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

Solution : -
Secondary growth occurs in most of the dicotyledonous roots and stems.

34. Secondary phloem is formed by
a) Procambium b) Plerome **c) Vascular cambium** d) Apical meristem

35. Which one of the following is resistant to enzyme action?
a) Cork b) Wood fibre **c) Pollen exine** d) Leaf cuticle

Solution : -
Pollen exine is resistant to enzyme action' It is made up of sporopollenin which is highly resistant biological products present around the pollen grain.

36. Vesselless angiosperms include
a) Tetracentraceae b) Trochodendraceae c) Winteraceae **d) All of these**

37. A transverse section of stem is stained first with safranin and then with fast green following the usual schedule of double staining for the preparation of a permanent slide. What would be the colour of the stained xylem and phloem?
a) Red and green b) Green and red **c) Orange and yellow** d) Purple and orange

38. The cells of the quiescent centre are characterised by
a) having dense cytoplasm and prominent nuclei **b) having light cytoplasm and small nuclei**
c) dividing regularly to add to the corpus d) dividing regularly to add to tunica.

Solution : -
A quiescent centre is found in the centre of the root apex. Cell divisions are very few in the quiescent centre as there is very little synthesis of new proteins. Cells of quiescent centre have small nuclei and light cytoplasm.

39. Stele does not includes
a) Pericycle b) Vascular bundles c) Pith **d) Endodermis**

40. Which exposed wood will decay faster?
a) Sapwood b) Softwood c) Wood with lot of fibres d) Heartwood

Solution : -
In old trees, secondary xylem or wood gets differentiated into outer light coloured functional sapwood or alburnum and inner dark coloured non-functional heartwood or duramen. Heartwood is stronger and highly durable because of presence of oils, resins, gums, tannins and tyloses which are plugged into the tracheids and vessel elements. As the secondary growth takes place size of heart wood increases because of conversion of inner alburnum (sapwood) into it.

41. Which of the following exemplifies emergences?
a) Root hair b) Stigmatic papillae **c) Prickles of Rosa indica** d) Oil glands on fruit skins

Solution : -
Prickles are an example of emergences. Emergences are multicellular epidermal outgrowths which also contain some inner tissues. They are sharp and stiff outgrowths e.g., prickles of Rosa indica.

42. Which of the following statements is correct about a woody dicot stem which shows extensive secondary growth?
a) Primary xylem persists in the centre of the axis. b) Primary and the older secondary phloem get crushed.
c) Secondary xylem forms the bulk of the stem. **d) All of these**

43. Heart wood is
a) Situated away form vascular cambium b) Situated near pith c) Nonfunctional **d) All of these**

44. Vascular tissues of angiosperms differ from those of gymnosperms in
a) presence of vessels in the xylem b) presence of well developed sieve tubes in phloem
c) presence of companion cells in phloem **d) all of these.**

45. In_____vascular bundle, a strip of vascular cambium is present in between the xylem and phloem.

a) open b) closed c) endarch d) exarch

Solution : -

In gymnosperms and dicot stems a strip of vascular cambium occurs between phloem and xylem of each vascular bundle. It is called intrafascicular (or fascicular) cambium. This strip of vascular cambium later produces secondary tissues. Such vascular bundles are described as open.

46. 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.

47. The secondary meristem originates from-

a) Promeristem b) Primary meristem **c) Primary permanent tissue** d) Secretory tissue

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

	Characters	**Monocot root**	**Dicot root**
(i)	Vascula bundle	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

Identify the incorrect differences and select the correct option.

a) (i) and (iii) b) (i) and (iv) c) (iii) and (iv) d) (ii) and (iii)

Solution : -

In monocot root, a well developed pith is present whereas in dicot root, pith is poorly developed. In monocot root, pericycle gives rise to lateral roots only whereas in dicot root, pericycle gives rise to secondary roots and cork cambium.

49. The intercalary meristems are infact, portions of

a) Lateral meristem b) Secondary meristem **c) Apical meristem**
d) Permanent tissue that becomes meristematic

50. When xylem and phloem are on same radius, the vascular bundles are said to be-

a) Radial **b) Conjoint** c) Concentric d) Concentric