ANATOMY OF FLOWERING PLANTS
DPP SET-6

1. Cambium activity is
   a) More active towards the periphery of stem
   b) More active towards the lateral sides of stem
   c) More active towards the inner side of stem
   d) Same on the both sides

2. Cambium is a type of
   a) Apical meristem
   b) Intercalary meristem
   c) Lateral meristem
   d) Permanent of mature meristem

3. Pith is a central part of the ground tissues generally made up of
   a) Parenchyma b) Collenchyma c) Chlorenchyma d) Sclerenchyma

4. Interfascicular cambium is found
   a) Between pith and vascular bundle b) Between two vascular bundles
   c) In the vascular bundle d) Outside the bundle

5. Meristematic tissue are
   a) Premature having ability of division
   b) Mature does not have ability of division
   c) Premature not having ability of division
   d) Complex differentiating in xylem, phloem and cambium

6. Medullary or pith ray is the
   a) Radial strip of parenchyma which is present between vascular bundles
   b) Radial strip of collenchyma which is present between vascular bundles
   c) Radial strip of sclerenchyma which is present between vascular bundles
   d) The another name of stele

7. Which of the function in the given options does not belongs to the monocot root?
   a) Conduction of water from the root hairs to the inner tissue
   b) Storage of food
   c) The outer most layer or layers of the cortex produce protective exodermis in the older roots
   d) Presence of secondary growth

8. Conjoint vascular bundles are common in
   a) Roots b) Stems c) Leaves d) Both (b) and (c)

9. Periderm is produced from
   a) Cork cambium b) Procambium c) Secondary cortex d) Vascular cambium

10. In stem, the xylem is
    a) Exarch b) Mesarch c) Endarch d) All of these

11. Initiation of lateral roots and vascular cambium during secondary growth organs occurs due to activity of
    a) Endodermis b) Pericycle c) Casparian strip d) Periderm

12. I. Sunflower seed
    II. A wheat leaf
    III. Pea plant
    IV. Leaf blade of grass
    Bulliform cells are present in which of the above plants?
    a) I and II b) II and III c) III and IV d) II and IV

13. I. Vessel, II. Tracheids, III. Companion cells
    Which of the following is/are living cells?
    a) I and II b) Only III c) II and III d) Only I

14. Vascular bundles, in which xylem and phloem occur as separate bundles are known as
    a) Collateral b) Bicollateral c) Radial d) Amphivasal

15. In old trees, the greater part of secondary xylem is dark brown due to the
    a) Deposition of inorganic material b) Deposition of organic material
    c) Activity of cambium d) Activity of secondary xylem

16. Intrafascicular cambium is present in between the
    a) Primary xylem and secondary xylem b) Secondary phloem and primary xylem
    c) Primary xylem and secondary phloem d) Primary xylem and secondary phloem

17. In dicotyledonous roots, the initiation of lateral roots takes place in
    a) Endodermal cells b) Cortical cells c) Epidermal cells d) Pericycle cells

18. The roots of angiosperms show exarch xylem and their stems have endarch bundles. These are continuous throughout the change occurs in
    a) Epicotyl region b) Hypocotyl region c) Upper part of root d) Lower part of stem

19. The stele found in monocot is
    a) Haplostele b) Atactostele c) Dictyostele d) Actinostele

20. Largest number of chloroplast is found in
    a) Palisade tissue b) Spongy tissue c) Transfusion tissue d) Bundle sheath cells

21. Arrange the following plants in ascending order based on the number of xylem strands in their roots.
    I. *Trapa* II. *Pisum* III. *Castanea* IV. *Nicotiana*
    a) II, IV, III, and I b) III, IV, II, and I c) IV, III, I, and II d) I, IV, II and III

22. 'Quiescent centre theory' was proposed by
    a) Nagelli b) Schmidt c) Hanstein d) Clowes

23. In an annual ring, the light coloured part is known as
    a) Early wood b) Late wood c) Heartwood d) Sapwood

24. In roots the
    a) Protoxylem lies towards the periphery
    b) Metaxylem lies towards the pith (centre)
    c) Both (a) and (b)
    d) Endarch condition is found

25. Epidermis is often covered with a waxy thick layer called
    a) Cuticle b) Suberin c) Supporting cell d) All of these

DPP SET-6 SOLUTION

1 **(c)**

Cambium is generally more active on the inner side than the outer. As a result the amount of secondary xylem produced is more than the secondary phloem and soon form a compact mass

2 **(c)**

Lateral Meristem The meristem occurs on the sides and take part in increasing girth of the plant. Only one type of primary lateral meristem is found in plants. It is intrafascicular cambium. The cambium lies in vascular bundles of dicot and gymnosperm stem in between phloem and xylem

3 **(a)**

The pith or medulla forms the central region of the stem and root. Usually, the pith of dicot stem is largely parenchymatous. It is devoid of chlorophyll in the mature state. The pith is not distinguishable in the mature state. The pith is not distinguishable in monocot stems.

4 **(b)**

As growth begins, the cells of medullary rays, which lie in between vascular bundles become active and rise to cambial strip called interfascicular cambium constitute cambium.

5 **(a)**

Tissue is a group of cells performing a particular function. Tissue are mainly of two types

(i) **Meristematic tissues** These tissues contain immature and young cells that are much active and capable of showing continuous divisions and redivisions. They may be promeristem, primary meristem, secondary meristem, apical meristem, intercalary meristem and lateral meristem.

(ii) **Permanent tissues** These are made up of mature cells, which have lost the capacity to divide and have attained a permanent shape, size and function, *e.g.,* simple (parenchyma, collenchyma, sclerenchyma), complex (xylem, phloem) and secretory tissue.

6 **(a)**

Medullary or pith rays They are the radial strips of parenchyma which are present between adjacent vascular bundles. The medullary rays connects the pith with pericycle and cork

7 **(d)**

Due to the absence of vascular cambium the monocots don't show secondary growth

8 **(d)**

Both (b) and (c).

When xylem and phloem within a vascular bundle are arranged in an alternate manner on different radii, the arrangement is called radial, such as in roots. In conjoint type of vascular bundles, the xylem and phloem are situated at the same radius of vascular bundles. Such vascular bundles are common in stems and leaves. The conjoint vascular bundles usually have the phloem located only on the outer side of xylem

9 **(a)**

The periderm consists of phellem (cork), phellogen (cork cambium) and phelloderm. The Phellogen develops in the epidermis, the cortex, the phloem or the root pericycle and produces phellem towards the outside and phelloderm towards the inside.

10 **(d)**

When the xylem is differentiated from the point of origin towards outside (i.e., periphery of axis), it is known as centrifugal xylem. In such cases as represented by stems, the protoxylem is situated towards inside and the metaxylem towards outside. This type of condition of xylem is called endarch.

11 **(b)**

Next to the endodermis lies a few layers thick-walled parenchymatous cells referred to as pericycle. Initiation of lateral roots and vascular cambium during secondary growth takes place in these cells

12 **(d)**

In the upper epidermis of monocots (*e.g.*, wheat, maize, cereals, grasses), there are some large cells found in groups which are known as motor cells or bulliform cells. These cells help in rolling of leaves in dry conditions

13 **(b)**

Companion cells are present between the sieve tubes in the phloem of angiosperms. There are living cells with a large nucleus that controls the activity of non-nucleated sieve tubes

14 **(c)**

The vascular bundles, in which xylem and phloem occur as separate bundles are known as radial vascular bundles, eg, root.

15 **(b)**

In old trees, the greater part of secondary xylem is dark brown due to the deposition of organic compounds like tanins, resins, oils, gums, aromatic substances and essential oils in the central or innermost layers of the stem. These substances make it hard, durable and resistant to the attacks of microorganisms and insects. The region comprises dead elements with highly lignified walls and is called heart wood

16 **(c)**

In dicot stems, the cells of cambium present between primary xylem and primary phloem are intrafascicular cambium. The cells of medullary cells, adjoining these intrafascicular cambium becomes meristematic and form the interfascicular cambium. Thus, a continuous ring of cambium is formed

17 **(d)**
In dicotyledonous roots, initiation of lateral roots and vascular cambium during the secondary growth take place in pericycle cells.

18 **(b)**
Root stem transition occurs in hypocotyl region of axis.

19 **(b)**
Monocots have atactostele, in which vascular bundles are arranged into more than one ring and they are usually found at the centre of stem.

20 **(a)**
The leaves of dicot plants are anatomically differentiated into epidermis, mesophyll tissue and vascular bundles. Mesophyll tissue is divided into upper palisade tissue, consisting of closely arranged cells with numerous chloroplasts and lower spongy tissue, which consists of loosely arranged cells separated by large air spaces. The cells of spongy tissue have fewer chloroplasts, hence most of the photosynthesis occur in palisade tissue.

21 **(d)**
Only one xylem strand occurs in the slender root of the hydrophyte Trapa natans. In Nicotiana, the roots are diarch. In Pisum, the root is triarch. In Castanea, the root is tetrarch.

22 **(d)**
Clowes proposed quiescent centre theory.

23 **(a)**
Spring wood plus autumn wood of a year constitute annual ring. The spring wood (also called early wood) is light in colour and constitute major part of annual ring. The autumn wood (also called late wood) is darker in colour.
Wood consists of secondary xylem. The central hard, tough and darker region of wood constitutes heart wood while peripheral portion constitutes sap wood. But these are not specified in annual rings.

24 **(c)**
In roots the protoxylem lies towards the periphery and metaxylem lies toward the centre. Such arrangement is called exarch

25 **(a)**
The outside of the epidermis is often covered with waxy thick layer called cuticle, which prevents the loss of water. Cuticle is absent in roots