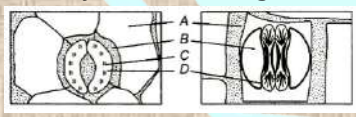
ANATOMY OF FLOWERING PLANTS
DPP SET-8

1. I. The 1° and 2° phloem get gradually crushed due to the continued formation and accumulation of 2° xylem
   II. 1° xylem remains more or less intact in or near the centre
   III. Secondary growth results in an increase in the length of the axis
   Select the correct statements
   a) I and II b) II and III c) I and III d) I, II and III

2. Cork is used as the stopper for bottles, for shock absorption and insulation because of
   a) It is light and compressible b) Non-reactive
   c) Sufficiently resistant to fire d) All of the above

3. Medullary rays are formed by the
   a) Radially placed parenchymatous cells between vascular bundles
   b) Longitudinally placed parenchymatous cells between vascular bundles
   c) Laterally placed parenchymatous cells between vascular bundles
   d) Obliquely placed parenchymatous cells between vascular bundles

4. Identify *A* to *D* in the given diagram and choose the correct option



   a) A-Epidermal cell, B-Guard cell, C-Subsidiary cell, D-Chloroplast
   b) A-Epidermal cell, B-Subsidiary cell, C-Chloroplast, D-Guard cell
   c) A-Epidermal cell, B-Chloroplast, C-Subsidiary cell, D-Guard cell
   d) A-Guard cell, B-Chloroplast, C-Subsidiary cell, D-Epidermal cell

5. The jute fibres anatomically are
   a) Bast fibres b) Cortical fibres c) Xylem fibres d) Pith fibres

6. Root apical meristem is derived from the
   a) Plumule part of embryo
   b) Scutellum part of embryo
   c) Radical part of embryo
   d) Endosperm part of embryo

7. Which of the following plants shows multiple epidermis?
   a) *Croton* b) *Allium* c) *Nerium* d) *Cucurbita*

8. The growth of root and stem in length with the help of apical meristem is called …A…. Apart from primary growth most dicotyledonous plant exhibit an increase in girth called …B… Choose the correct combination of A, B and C in respect to the above paragraph
   a) A-primary growth; B-secondary growth
   b) A-secondary growth; B-primary growth
   c) A-secondary growth; B-tertiary growth
   d) A-primary growth; B-tertiary growth

9. Which of the following statement is correct?
   a) Study of the internal structure is called anatomy
   b) Plants have cells as the basic unit cells, are organised into tissues
   c) Tissues are organised into organs
   d) All of the above

10. In monocotyledonous stem, the vascular bundles are
   a) Conjoint and open
   b) Conjoint and closed
   c) Scattered through out the ground tissue
   d) Both (b) and (c)

11. Conjuctive tissue is made up of
   a) Parenchymatous cells, *i.e.*, in between the xylem and phloem
   b) Sclerenchymatous cells, *i.e.*, in between the xylem and phloem
   c) Collenchymatous cells, *i.e.*, in between the xylem and phloem
   d) Merismatic cells, *i.e.*, in between the xylem and phloem

12. I. Peripheral vascular bundles are smaller than the centrally located vascular bundles
   II. Phloem parenchyma is absent
   III. Water parenchyma cavities are present within the vascular bundles
   Which of the above characters belong to the monocotyledonous stem?
   a) I and II
   b) II and III
   c) III and I
   d) I, II and III

13. Early wood is formed in dicot plant during
   a) Spring season
   b) Winter season
   c) Autumn season
   d) Summer season

14. The meristem which is particularly present in the mature regions of roots and shoots and produce woody axis and appear later than the primary meristem is called
   a) Secondary meristem
   b) Intercalary meristem
   c) Apical meristem
   d) Tertiary meristem

15. A monocot stem with secondary growth is
   a) *Lilium*
   b) *Cocos*
   c) *Yucca*
   d) *Asparagus*

16. Ground tissue includes
   a) All tissues except epidermis and vascular bundles
   b) Epidermis and cortex
   c) All tissues internal to endodermis
   d) All tissues external to endodermis

17. Cambium is present in between
    a) Phloem and xylem
    b) Permanent mature cells
    c) Collenchyma and sclerenchyma
    d) Collenchyma and parenchyma
18. All the following statements regarding sieve tube elements are true except
    a) Their end walls have perforated sieve plates which become impregnated with lignin at maturity
    b) They possess peripheral cytoplasm as well as a large vacuole
    c) Distinct proteinaceous inclusions, the P-proteins are seen evenly distributed throughout the lumen
    d) Long, slender, tube-like structures arranged in longitudinal series
19. 'Exarch' is the condition of vascular bundles in which
    a) Protoxylem lies toward the outside and metaxylem lies inward
    b) Metaxylem lies toward the outside and protoxylem lies inward
    c) Metaxylem lies toward the lateral side and protoxylem lies inward
    d) Protoxylem lies toward the lateral side and metaxylem lies inward

20. Select the correct statements
    I. Epidermal call have small amount of cytoplasm and a large vacuole
    II. Waxy layer cuticle is absent in roots
    III. Root hairs are unicellular, while stem hairs/trichomes are multicellular
    IV. Trichomes are branched/unbranched, soft/stiff and secretory or transpiration preventive
    V. Guard cells are dum-bell-shaped in dicots and bean-shaped in monocots (*e.g.*, grass)
    a) All except I and II
    b) All except III
    c) All except II and IV
    d) All except IV

21. I. Protection of internal tissue
    II. Prevention of entry of any harmful organism
    III. Minimising surface transpiration
    IV. Protection against excessive heating up
    These are the functions of which of the following?
    a) Epidermis
    b) Cortex
    c) Hypodermis
    d) Cuticle

22. In a woody dicotyledonous tree, which of the following parts will mainly consist of primary tissues?
    a) Stem and root
    b) All parts
    c) Shoot tips and root tips
    d) Flowers, fruits and leaves

23. Old stem on *Combretum* has
    a) Inter and intraxylary phloem
    b) Inter and extraxylary phloem
    c) Intra and extraxylary phloem
    d) All of the above

24. Atactostele type of stele is found in
    a) Dicot
    b) Monocots
    c) Both (a) and (b)
    d) Only in gymnosperm

25. I. Sieve tube conduct organic food longitudinally
II. Xylem parenchyma cells stores food and help in lateral conduction of sap
Select the correct option
a) I is incorrect, but II is correct
b) II is incorrect, but I is correct
c) I and II are correct
d) I and II are incorrect

DPP SET-8 SOLUTION

1 **(a)**

Secondary growth increases the girth not length of the plant. Length of the plant increases by apical meristem

2 **(d)**

Cork prevents the loss of water by evaporation. It also protects the interior against the entry of harmful microorganisms, mechanical injury and extremes of temperature. Cork is light, compressible, non-reactive and sufficiently resistant to fire. It is used as stopper for bottles, shock absorption and insulation

3 **(a)**

Dicot stem In between the vascular bundles, there are few layers of radially placed parenchymatour cells. These parenchymatous cells are called medullary rays

4 **(b)**

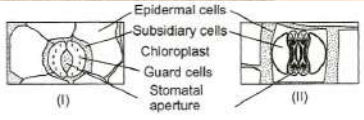


Diagram (I) Represents the dicotyledon plant because having bean-shaped guard cells
Diagram (II) Represents the monocotyledon plant because of having dumb-bell shaped guard cells

5 **(a)**

Bast or phloem fibers are present in pericycle (*e.g., Corchorus capsularis* (jute), *Hibiscus cannabinus* (patsan), *Crotalaria juncea* (sunnhemp). These fibres are also known as extraxylary fibers.

6 **(c)**

Root Apical Meristem It is found at the tip of the main root and its branches. In case of tap root system, the root apical meristem is formed from radicle part of the embryo or its derivatives. In adventitious root, the root apical meristem is produced from the derivatives of shoot apex

7 **(c)**

Usually, epidermis consists of single layer of epidermal cells (i.e., uniseriate). But in case of Nerium, multiple epidermis is found with thick-walled epidermal cells.

8 **(a)**

The primary growth in plants occur as a result of activity of the apical meristem, which helps in the elongation of roots with the help of root apical meristem and elongation of stem with shoot apical meristem. Dry growth is exhibited by the presence of vascular cambium

9 **(d)**
Study of internal structure of plants is called anatomy. Plants have cells as the basic unit, cells are organised into tissues and in turn the tissues are organised into organs

10 **(d)**
In monocotyledon, the vascular bundles are scattered throughout the ground tissue. They are conjoint and closed (not having vascular cambium)

11 **(a)**
The parenchymatous cells which lies between the xylem and the phloem are called conjuctive tissue

12 **(d)**
I, II and III.
The monocot stem has a sclerenchymatous hypodermis, a large number of scattered vascular bundles, each surrounded by a sclerenchymatous bundle sheath, and a large, conspicuous parenchymatous ground tissue. Vascular bundles are conjoint and closed. Peripheral vascular bundles are generally smaller than the centrally located ones. The phloem parenchyma is absent and water-containing cavities are present within the vascular bundles

13 **(a)**
The activity of cambium is under the control of many physiological and environmental factors. In temperate regions, the climatic conditions are not uniform through the year. In the spring season, cambium is very active and produces a large number of xylary elements having vessels with wider cavities. The wood formed during this season is called spring wood or early wood

14 **(c)**
The meristem that occurs in both roots and shoots and produce the woody axis and appear later than the primary meristem are called the secondary meristem

15 **(c)**
Secondary growth is the growth in girth of stem and roots. Anamolous or abnormal secondary growth is found in some monocot stems such as Yucca, Dracaena, Aloe, Agave, etc.

16 **(a)**
All tissues except epidermis and vascular bundles constitute the ground tissue or fundamental tissue. It consists of simple tissues such as parenchyma, collenchyma and sclerencyma. Ground tissue includes cortex, pericycle, medullary rays. In leaves the ground tissue consists of mesophyll.

17 **(a)**

In monocotyledons, the vascular bundles have no cambium present in them. Hence, they don't form secondary tissue and referred to as closed vascular bundles. Generally, monocotyledons have the closed vascular bundles

18 **(a)**

Sieve tubes are elongated tubular conducting channels of phloem. Each sieve tube is formed of several cells called sieve tube members, sieve tube cells or sieve elements. Sieve tube members are placed end to end. The end walls are generally bulged out. They may be transverse or oblique. They have many small pores or sieve pits. Each sieve pore is lined by a layer of callose. Due to the presence of sieve pits. The end walls are commonly called sieve plates

19 **(a)**

Exarch It is the condition of vascular bundles in which the protoxylem (earlier formed xylem) lies toward the outside and metaxylem (later formed xylem) lies toward inward

Endarch It is the condition of vascular bundles in which the protoxylem (earlier formed xylem) lies toward the inner side and metaxylem (later formed xylem) lies outside

20 **(d)**

All except IV.

Epidermal cells are elongated compactly arranged and form continuous layer called epidermis. Stomata are present in epidermis of leaves and regulate process of transpiration and gaseous exchange. The epidermal hairs, i.e., root hairs, unicellular elongations and trichomes, multicellular elongation of epidermis on root and shoot helps in absorbing water and preventing water loss, respectively.

All of these.

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.

In grasses (monocotyledons), the guard cells are dumb-bell shaped and in dicotyledonous (bean, castor, pea), the guard cells are bean or kidney-shaped

21 **(a)**

The various function of the epidermis are

(i) Protection of internal tissues

(ii) Prevention of entry of harmful organisms

(iii) Minimising surface transpiration by having thick cuticle

(iv) Exchange of gases through stomata

(v) Protection against excessive heating up and sudden changes in temperature with the help of hair (as in sunflower)

22 **(c)**

In a woody dicotyledonous tree, shoot tips and root tips consist of primary tissues.

23 **(b)**

In Combretum and Entada, the cambium shows abnormal behavior by cutting phloem on the inner as well as at certain places for a short period and then resumes normal activity.

24 **(b)**

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

25 **(c)**

Phloem lie towards the pericyclet on the outerside of vascular bundle. Phloem consists of sieve tubes, companion cells, phloem parenchyma and phloem fibres. The companion cells and phloem parenchyma are connected with sieve tubes through pits. They help in lateral flow of organic food. The companion cells also control the functions of the sieve tubes. The sieve tubes conduct organic food longitudinally