

QB365

Important Questions - Anatomy of Flowering Plants

11th Standard CBSE

Biology

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) Write the location of root apical meristem and shoot apical meristem 1
- 2) Give two examples of lateral meristem in plants 1
- 3) Arrange the following in the sequence you would find them in a plant starting from the periphery-phellogen, phellogen, phellogen, phellogen, phellogen, phellogen. 1
- 4) What is the common name of root epidermis ? 1
- 5) In how many zones, the ground tissue system is differentiated ? 1
- 6) Why is cambium called as lateral meristem? 1
- 7) Why xylem vessels are called syncytes 1
- 8) How do the bulliform cells present in the epidermis help grasses? 1
- 9) What is the present on the surface of the leaves which helps the plant prevent loss of water, but is absent in roots? 1
- 10) What are the cells that make the leaves curl in plants during water stress? 1

Section-B

- 11) Large number of stomata are seen on lower surface of dicot leaves or on the upper surface? 2
- 12) How the study of anatomy is useful to us ? 2
- 13) Differentiate between vascular tissue of gymnosperms and angiosperms 2
- 14) Differentiate between pith in dicot root and monocot root. 2
- 15) Write one difference between mesophyll of dicot leaf and a monocot leaf. 2
- 16) Mention the functions of cortex region of monocot root? 2
- 17) Give the functional difference between phellogen and phellogen. 2
- 18) Write the characteristics of heartwood and sapwood. 2
- 19) What are the characteristic difference found in vascular tissue of gymnosperms and angiosperms? 2
- 20) Why are xylem and phloem called complex tissues? 2

Section-C

- 21) Cork cambium forms tissues that form the cork. Do you agree with this statement? Explain 5
- 22) What is the difference between lenticels and stomata 5
- 23) Deciduous plants shed their leaves during hot summer or autumn. This process of shedding of leaves is called abscission. Apart from physiological changes, what anatomical mechanism is involved in the abscission of leaves? 5

24) Explain the process of secondary growth in the stems of woody angiosperms. What is its significance? 5

Section-A

- 1) Root apical meristem - Root Tip Shoot apical meristem - Topmost regions of stem axis. 1
- 2) Fascicular cambium and phellogen (cork cambium). 1
- 3) Phellem(cork)-phellogen(cork cambium)-phellogen (secondary cortex). 1
- 4) Epiblema 1
- 5) In three major zones, i.e., cortex pericycle and pith with medullary rays. 1
- 6) 1
The cambium lies parallel to the circumference and helps to increase in girth, hence is called as lateral meristem
- 7) The xylem vessels are formed from a number of cells, so they are called syncytes 1
- 8) 1
The bulliform cells present in the epidermis of grasses help in folding of leaves during hot summer days and prevent transpiration
- 9) Waxy cuticle layer 1
- 10) Bulliform or motor cells. 1

Section-B

- 11) The stomata are more in number in the lower epidermis than the upper epidermis. 2
- 12) The study of anatomy helps to us in 2
 - (i) solving taxonomic problems
 - (ii) analysing the microstructure, adulteration of spice, tea, tobacco, etc.
 - (iii) extraction of compounds for use as medicine
 - (iv) differentiation of inferior quality wood from the superior quality
- 13) Differentiate between vascular tissue of gymnosperms and angiosperms 2

vascular tissue of gymnosperms	vascular tissue of angiosperms
Xylem is devoid of vessels	Xylem possesses vessels
Phloem does not contain sieve tube	Sieve tube are present
Phloem does not contain companion cells	Phloem possesses companion cells
- 14) Differences in pith in monocot and dicot roots are 2

Pith in monocot Root	Pith in Dicot Root
The centre of root is occupied by the pith.	It is often absent. When present, it is very small.
Intercellular spaces are present between pith cells	Intercellular spaces are absent.
The pith cells store food.	The pith cells store food as well as waste materials
- 15) 2
In dicot leaves, mesophyll is differentiated into palisade and spongy parenchyma. In case of monocot leaves, mesophyll is not differentiated and all cells are like spongy parenchyma.

- 16) The cortex of a monocot root has three following functions: 2
- (i) Conduction of water from the root hairs to the inner tissues.
 - (ii) Storage of food.
 - (iii) Outermost layer of the cortex produce protective exodermis in the older roots.

- 17) 2
- Difference between phellogen and phelloderm is

Phellogen

It is a ring of meristematic cells that divide and form cork on outside and secondary cortex on the inner side.

Phelloderm

It is a tissue made up of suberised parenchymatous cells that transfer nutrients and water to phellogen cells for their activity.

- 18) 2
- Heartwood** It is secundary xylem with highly lignified walls. In old trees, considerable region of secondary xylem is dark brown due to accumulation of tanini, resins, oils, gums and other organic materials. The substances make is heart and resistant to microbes and insects.

Sapwood Sapwood is the peripheral region of secondary which is lighter in colour and involved in conduction of water and minerals from root to leaf

- 19) 2
- In gymnosperms , Vessel elements are not present in xylem, whereas , these are main constituents in angiosperms . In the phloem of gymnosperms, companion cells are not associated with the sieve elements . In angiosperms , companion cells are associated with the sieve elements of phloem.

- 20) 2
- A group of more than one type of cells having common origin and working together as a unit , is called complex tissues,. Since both xylem and phloem are made up of several kinds of cells , they are called complex tissues.

Section-C

- 21) 5
- Yes, the cork cambium forms tissues that form cork. Cork cambium (phellogen) produces new cells both on its outer surface and inner surfaces . The cells formed on the outer side differentiate into cork, also called phellem.

Soon, its wall becomes suberised and living protoplasm dies. The empty cells get filled with tannins, alkaloids and air. The dead, suberised cell is called cork or phellem.

- 22) Difference between lenticels and stomata are given below 5
- | | |
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| <p>Lenticels</p> <p>Found in old stem and root</p> <p>Present in cork tissues.</p> <p>Contain a number of complementary cells permanently remain open</p> | <p>Stomata</p> <p>Found in leaves and young stem</p> <p>Present in epidermis</p> <p>Stomata contain two guard cells</p> <p>Stomata open and close in response to turgidity of guard cells</p> |
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23)

5

The hormones secreted by plant body influence anatomical changes in it. In the future are of abscission, a special narrow abscission zone develops. It consists of a upper lignified and suberised protective layer. The separation layer consists of unthickened cells where the hydrolysing enzymes develop. Pectinases are secreted out to dissolve middle lamellae. Cellulases bring about hydrolysis of cell walls. Due to this, the separation layer becomes soft and weak. This leads to shedding of leaves from plants.

24)

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Secondary growth in stems of woody angiosperms occurs by two types of cambia, i.e., vascular cambium and cork cambium

(i) Vascular Cambium Certain cells of medullary rays become meristematic to form interfascicular cambium. The fascicular cambium and the interfascicular join to form a complete ring called cambial ring. The cells of the cambial ring undergo mitotic divisions and produce secondary phloem on its outer side and secondary xylem on its inner side.

At places, vascular cambium possess ray initials. They form vascular rays, phloem rays in secondary phloem and wood rays in secondary xylem.

As new secondary phloem becomes functional, the previous older phloem gets crushed. Secondary xylem or wood persists. As a result wood grows with age in the form of annual rings.

In each annual ring, there is wide or broader spring or early wood or spring wood and narrow autumn or late wood.

In old stems, the central part of wood becomes non-functional and dark coloured due to presence of tyloses and deposition of resins, gums, and tannins. It is called duramen or heartwood. The outer functional wood is called sapwood.

(ii) Cork Cambium As the stem continues to increase in girth due to the activity of vascular cambium the outer cortical and epidermal layers get broken and need to be replaced to provide new protective cell layers. In this way, cork cambium or phellogen develops in the cortex region. Phellogen cuts off cells on both sides.

The outer cells differentiate into cork or phellem while, the inner cells differentiate into cork or phellem while, the inner cells differentiate into secondary cortex or phelloderm. Due to activity of cork cambium, pressure builds up on the remaining layers peripheral to phellogen and ultimately these layers peripheral to phellogen and ultimately these layers die and sloughed off.

At places, aerating pores called lenticules develop, which have loosely arranged complementary cells.

Significance of secondary Growth

(i) It replaces old non-functional tissues.

(ii) It provides fireproof, insect proof and insulating cover around the older plant parts.

(iii) Commercial cork is a product of secondary growth.

(iv) Wood is the product of secondary growth.