CBSE Class 11 Biology

Important Questions

Chapter 6

Anatomy of Flowering Plants

1 Marks Questions

1. Name the tissue represented by the jute fibres used for making the ropes.

Ans. Selerenchyma.

2. Which kind of tools have polyarch vascular bundles?

Ans. Monocotyledonous roots.

3. What is heart wood?

Ans. The hard central region of tree trunk made up of xylem vessels.

4. St the role of pith in stem.

Ans. Pith stores the food material.

5. Where arc bulliform cells found in Ieaves?

Ans. Bulliform cells are found in the upper epidermis of monocot leaves.

6. Which meristem does produce growth in length?

Ans. Primary meristem.

7. Which forms the cambial ring in a dicot stem during the secondary growth?

Ans. fascicular and intrafascicular strips of meristem.

8. Name the anatomical layer in the root from which the Iateral branches of root originate.

Ans. Pericycle of mature zone.

9 Which tissue of the leaf contains chloroplast?

Ans. Mesophyll tissue.

I0. A plant tissue when stained, showed the presence of hemicellulose and pectin in cell wall of its cells. Name the tissue.

Ans. Chollenchyma.

11. Give the function of lentcels.

Ans. Permit exchange of gases.

12. The vascular bundles are surrounded by a thick layer of cells. What is the name of the cells?

Ans. Bundle sheath cells.

13.Whercarecasparian strips found?

Ans. Endodermis.

14. Give the function of companion cells.

Ans. Maintain pressure gradient in sieve tubes.

15.Name two specialized kinds of parenchyma.

Ans.(i) aerenchyma

(ii) Chlorenchyma.

16.What is the function of companion cells in phloem ?

Ans. Companion cells help the sieve tube members in translocation of food material

17.Define meristem.

Ans. All the cells of an embryo of the plant are capable of division but, in a localized region cell division occur continuously. It is called meristem.

18.When does vascular bundle refer to as closed bundles.

Ans. When cambium is absent.

19.Name the aerating pores in the bark of stems.

Ans. Lenticels

20.What are sclereids?

Ans. Sclerieds are thick walled, hard & strongly lignified selerenchyma cells.

21.Name the tissue represented by jute fibres used for making ropes?

Ans. Sclerenchyma.

22.Why xylem & phloem are called complex tissues?

Ans. Because they are made up of more than one type of cells that work together as a unit.

23.Name the types of wood in which vessels are absent.

Ans. Soft wood eg. pinus.

24.What are the functions of tracheids.

Ans. Tracheids transports water & give mechanical support to the tree.

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2 Marks Questions

1. Why is cambium considered to be lateral meristem?

Ans. The cambium is considered as a latent meristem because it occurs along the Later at sides of the stem and roots and appears tater than primary meristem. Cells of this meristem divide periclinally and increase the thickness of the plant body.

2. Give any four differences between tracheids and vessels.

Ans.

Tracheid	**Vessel**
1.A tracheid is formed from a single cell. **2.The ends are rounded or transverse.** **3.They are comparatively narrower.** **4.The lumen is narrower.**	1. A vessel is made of a number of cells. 2.The ends are generally oblique and tapering. 3.They are comparatively wider. 4. The lumen is wide.

3. How are open vascular bundles differ from closed vascular bundles?

Ans. Open Vascular bundles These vascular bundles contain a strip of cambium in between phloem and xylem. Open vascular bundles aer collateral and bicollateral. Closed Vascular bundles Ititmfascicular cambium is absent. Closed vascular bund s can be collateral orconecti I

4. What are trichomes ? State their functions.

Ans. Trichomes arc multicellular epidermal hairs on the stem, sect or fruits. Trichomes help

in protection, dispersal of Mitts and seeds and reduction in water loss.

5. Given below are (he various types of tissue and their functions. Which out of these is not a matching pair and why:

(a)Collenchyma:provides mechanical support to the giowingparts of plant.

(b)Sclerenchyma:photosynthesis, storage and secretion.

(c)Chlorenchyma:perform the function of photosynthesis.

(d)Xylem:conduction of water and minerals.

Ans. (b) Selerenchyma: photosynthesis, storage and secretion is not a matching pair. The function of selerenchyma is to provide mechanical support to organs.

6. Why is cambium considered to be a lateral meristem ?

Ans. These meristems are present along the lateral sides of stem & roots therefore these are called lateral meristem. Interstealer cambium ring formed by intrafasicular & inter fascicular are two examples of lateral meristem.

7. Mention four characteristics of sunflower's vascular bundles.

Ans.

(i) Xylem & phloem occurs as alternate separate patches on different radii.

(ii) Xylem is exarch.

(iii) The number of rays is equivalent to the number of xylem bundles & accordingly xylem condition in the root may be called as monarch.

(iv) Diarch, triarch, tetrarch, pentarch, hexarch & poly arch.

8. Differentiate between tracheids & vessels.

Ans.

TRACHEIDS	VESSELS
i) found in all vascular plants	i) Found in angiosperms only
ii) They are shorter & dead at maturity	ii) They are very big & dead at maturity.
iii) Lumen is narrow	iii) Lumen is wider.
iv) Tracheids have pointed ends.	iv) End walls mostly absent.

9. What are tracheary elements? Of what use are these to plants ?

Ans. Tracheary elements are vessels & tracheids. They are conducting cells of the xylem. The xylem vessels have perforations in their end walls while perforations are absent in tracheids, they form a continuous channel through root, stem & leaves for conduction of water & minerals.

10. Distinguish between collenchymas& sclerenchyma.

Ans.

COUENCHYMA	SCLERENCHYMA
i) Living mechanical tissue contains protoplasm	i) Mechanical tissue is dead.
ii) Thickening in cell wall due to cellulose, hemicelluloses & pectin	ii) Thickening on cell walls due to deposition of lignin cellulose or both.
iii) High water content in cells	iii) Low water content in cells
iv) Cell lumen is wide.	iv) Cell lumen is narrow.

11. Why large number of stomata are seen on lower surface of dicot leaves in terrestrial plants.

Ans. Stomata are found on the epidermis of green aerial parts of plants but they are abundant on lower surface of leaves of dicot plants as they are helpful in regulation of the process of transpiration.

12. What is stomatal apparatus ? Draw a well labelled diagram of stomata.

Ans. The stomata occurs on the surface of leaves. They regulate transpiration in plant &

exchange of gases. Each stomata is made of 2 bean shaped cells called guard cell. The guard cells possess chloroplast & regulate opening & closing of stomata. The stomatal aperture, guard cells & surrounding subsidiary cells make the stomatal apparatus.

13. How can you identify a monocot stem and a dicot stem? Give reasons.

Ans. In monocot stem, the vascular bundles are scattered. No distinction between pitch & cortex. Cambium is not present. Vascular bundles are closed whereas, dicot stem shows epidermis, cortex & stele. Epidermis bears appendages-trichomes. The vascular bundles are open & are arranged in rings. Cortex & pith are distinct cambium present.

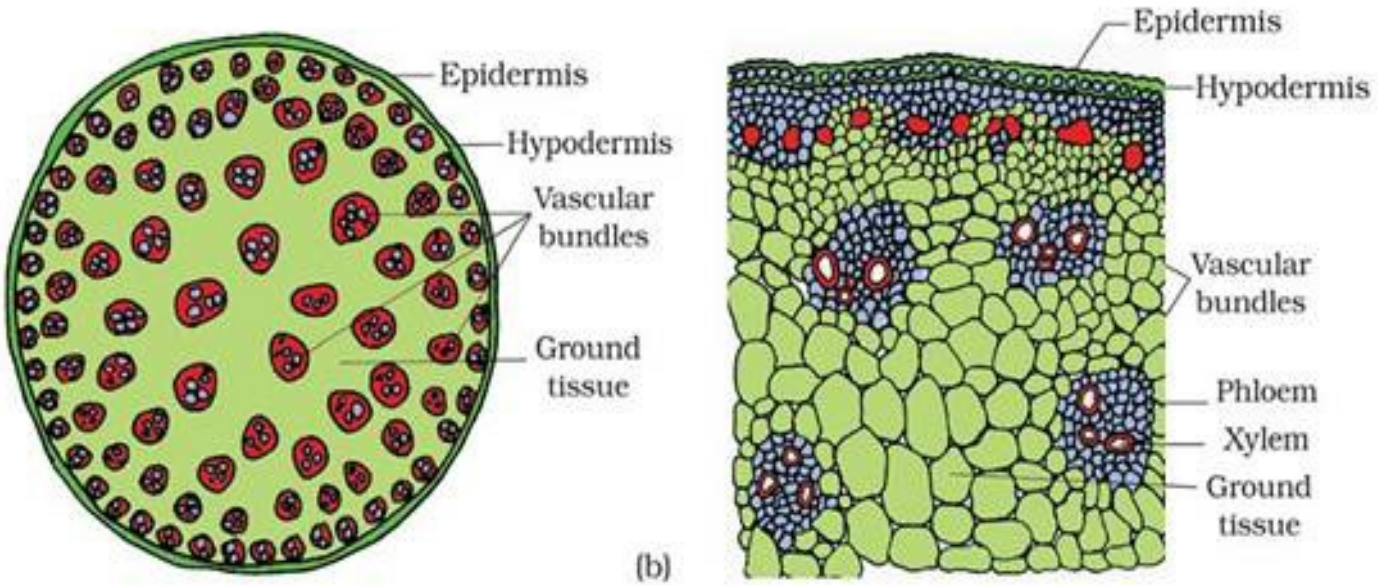
14. Differentiate between xylem & phloem.

Ans.

PHLOEM	**XYLEM**
i) conduction of food	i) conduction of water & minerals
ii) Phloem fibres are dead, sieve tube, companion. Cells and phyoem pareuchyma are living	ii) Tracheids, vessels & sclerenchyma are dead. Xylem parenchyma are living.
iii) It occurs in small quantity	iii) It occurs in large quantity.

15. Draw a well labeled diagram of T.S. of monocot stem.

Ans.



16. What is phellogen? What does it produce?

Ans. Phellogen is called cork cambium. It is developed to protect the inner tissues in dicot stems it develops from hypodermal cells which are collenchymatous or even from epidermal cells near to cortex. Phellogen or cork cambium produce secondary tissue more on outer side then inner side.

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3 Marks Questions

1. Differentiate between enderch and exarch conditions.

Ans.

Endarch condition	**Exarch condition**
1.Protoxylem towards pith and metaxylem towards periphery **2.Found in Stem**	1. Protoxylem to wards periphery and metaxylem towards pith 2. Found in root.

2. If you am provided with microscopic preparation of transverse section of a meristemie tissue and permanent (issue, howwou1dyoudistin.

Ans. Meristematic tissues am composed of cells that have the capability to divide. These cells are exist in different shapes without intercellular space. Cells are thin walled, rich in protoplasm, with out vacuoles.

Permanent tissues arc derived from meristematic tissue and are composed of cells have (heir definite shape, size and function. These cells may be thin walled (living) or thick waited (dead).

3. Differentiate(e between arenchyma and collenchyma on (he basis of (heir structure and function.

Ans.

Arenchyma	**Collenchyma**
(a)Parenchymatous tissue containing large	(a) Tissure contains deposits of cellulose and large pectin at the corner of cells.

air space. **(b)Thin walled cells, isodiametric in shape with intercellular space.** **(c)Provides buoyancy to the plant.**	(b) Consists of oval and polygonal cells without intercellular space. (c) Provides elasticity and mechanical strength.

4. Are there any tissue elements of phloem which arc comparable to (hose of xylem? Explain.

Ans. (a) The sieve elements of phloem is comparable to the vessel of the xylem because both tack nucleus.

(b) Phloem fibre is similar to the xylem fibre because both provide tensile strength to the tissue.

(c) Phloem parenchyma and xylem parenchyma is the living components of phloem and xylem respectively.

5. PaIm is monocotyledonous plant, yet it increases in girth. How is it possible?

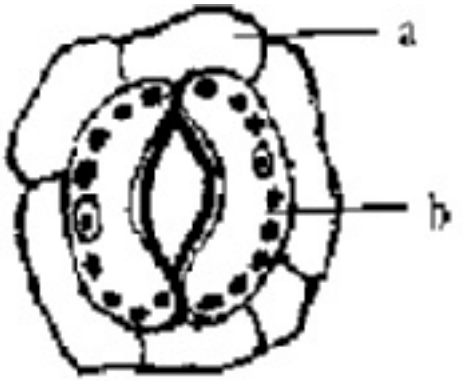
Ans. A pain lice is not plant, hence do not have primary cambium in the vascular bundles of stem. However, with a the tree grows in diameter. A secondary cambium may be for,uc4 in the hypodermal region of the stem. The later forms the conjuctive tissue and patches of met cells. The activity of meristmatic cells results in the formation of secondary vascular bundles.

6. Observe the figure and answer the following questions:

(i) Name parts (a)and(b)

(ii) Are those types of stomata observed in monocot or in dicot plants?

(iii) Which parts of stomata constitute the stomata apparatus?



Ans. (i) a: epidermal cell b: guard cell

(ii) In dicot plants.

(iii) The stomatal apparatus includes the stomata! aperture, guard cells and the surrounding subsidiary cells.

7.Explain the structure & function of collenchyma.

Ans. Collenchymas has polygonal cells & has unevenly thickened walls which are prominent at the corners. It is an example of simple tissue. Cells are more or less elongated with primary, non-lignified cell wall. The wall thickening is primary in nature & is composed of cellulose, hemicelluloses & pectin materials with high percentage of water. The thickening may be primarily at the corners or angles of the cells. They are found mostly in the hypodermis of herbaceous dicots in the form of homogenous layers or in the patches.

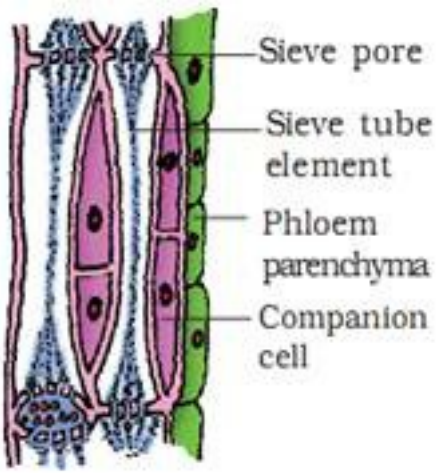
FUNCTION:- The main function of this tissue is to give strength to the plant parts. They also provide elasticity & support to the growing organs.

8.What are sieve elements? Explain their types & functions.

Ans. Sieve elements are the parts of phloem. They are meant for translocation & conduction of food material. Sieve elements are of two types:-

(a) Sieve cells:- sieve cells are present in pteridophytes and gymnosperms. The cell wall is perforated. There are sieve plates throughout end walls & lateral walls.

(b) Sieve tubes:- sieve tubes are present in angiosperms. Many sieve cells are connected to each-other to form a channel. There are sieve plates of the walls.



9.State the location & function of different types of meristems.

Ans. A meristem is a group of cells that are in a continuous state of division and thus continuously produce new cells on the basis of location & function, the meristem are of following types:-

(a)APICAL MERISTEM:- These are present at the apices of stems, roots & branches the activity of apices of stem adds to length of plant or its parts.

(b)INTERCALARY MERISTEM:- These meristems are intercalated in between the permanent tissues. They may be present cither at the base of internode as in stem of various grasses & wheat, the activities of these meristems also add, to length of plant or its organ.

(c)LATERAL MERISTEMS:- These meristems are present along the side of the stem these include cambium & cork cambium. The activity of lateral meristem adds to thickness of plan.

10.Describe the internal structure of a dicot root.

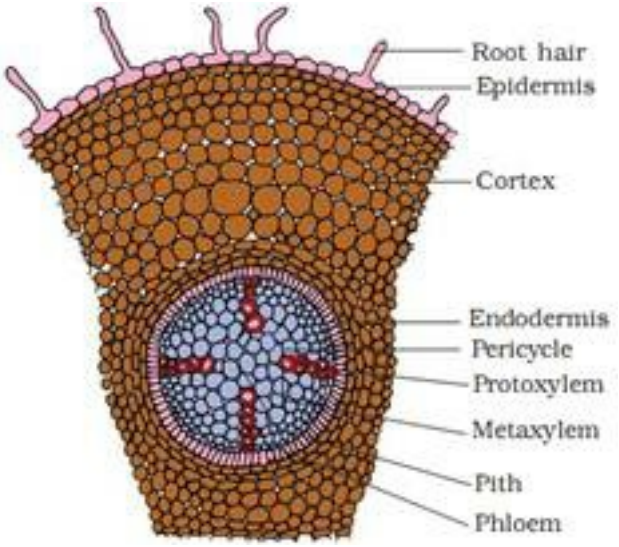
Ans. A T.S. of dicot root shows the following structures:-

(a)EPIBLEMA:- It is called piliferous layer. Unicellular root hairs extend to outside from the epiblema.

(b)CORTEX:- It is the main part of root having many layers of rounded parenchymatous cells contain starch grains. Intercellular spaces are present in between them. It stores formed substances.

(c)ENDODERMIS:- It lies inner to cortex & contain barrel shaped cells having no intercellular spaces. Radial walls of its cells may have lignified casparian strip water & minerals pass through passage cells to phloem.

(d)STELE:- It is the central part of dicot root. Inner to endodermis lays pericycle which is single layered thick only. Phloem & xylem are present in different radii to form separate bundles.



11.Describe the elements of xylem with the help of suitable diagram.

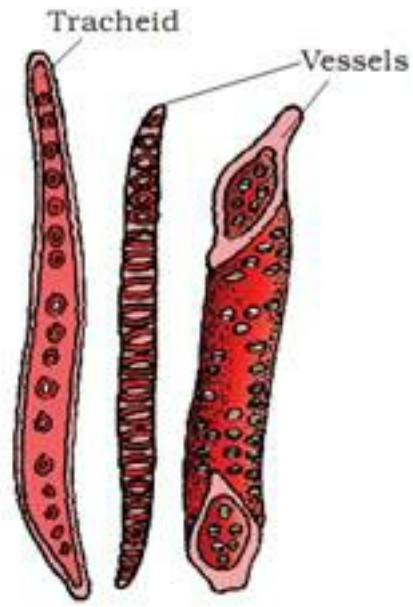
Ans. Xylem being a complex tissue is made up of different types of cells as follows:-

(a)TRACHEIDS:- They are elongated tube like structures. They do not have perforation or openings at their ends. They are dead. They help in conduction of water & minerals.

(b)VESSELS:- They are narrow tube like structures having annular & spiral thickening in protoxylem. They are wider & have spiral, reticulate & pitted thickening in metaxylem. They are dead. They help to conduct water & mineral from roots to upper parts of plant.

(c)XYLEM PARENCHYMA:-They are living cells. They are called as wood parenchyma they help in storage of food & lateral transport of substances.

(d)XYLEM FIBRES:- They are long, slender, pointed, dead sclerenchymatous cells. They are called wood fibres. They have small pits & thickened walls they give strength & support to plants.



12.Distinguish between dicot root & monocot root.

Ans.

DICOT ROOT	**MONOCOT ROOT**
i) diarch/ triarch/ telrarch/ pentarch or hexarch	i) always polyarch
ii) Cortex narrow	ii) Cortex very wide.
iii) The casparian strips are more prominent in endodermal cells.	iii) The casparian strips are not very prominent in endodermal cells.
iv) Pericycle gives rise to primordial of lateral roots, cork cambium as well as part of vascular cambium	iv) Pericycle give rise to lateral roots only
v) Vessels & tracheids polygonal in T.S	v) vessels & tracheiols oval in T.S
vi) Secondary growth is present	vi) Secondary growth is absent
vii) Conjuctive parenchyma makes vascular cambium.	vii) Conjuctive parenchyma do not make vascular cambium.
viii) Pith very small or absent.	viii) Pith is very large
ix) Passage cells are absent in endodermis	ix) Passage cells are present in endodermis
x) conjuctive tissue is parenchymatous	x) conjuctive tissue can be parenehymatous or sclerenchymatous.

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5 Marks Questions

1.Describe the internal structure of a monocot root with the help of a labeled diagram.

Ans.A T.S. of monocot root shows the following tissues:-

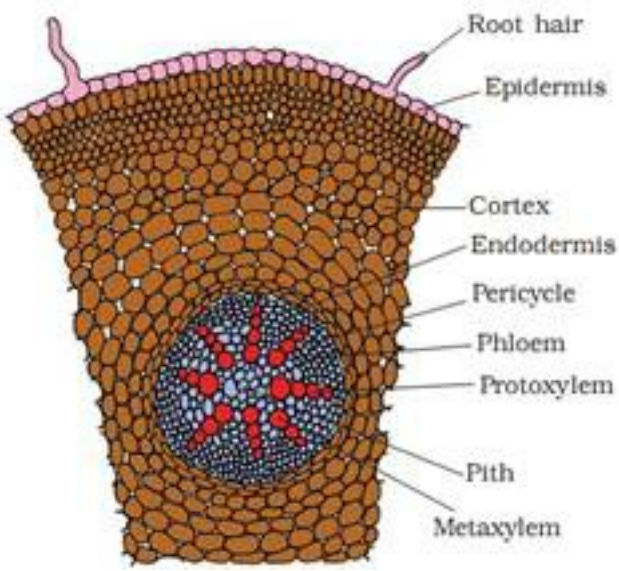
(a)EPIDERMIS:- It is the outermost layer of root having no intercellular spaces stomata & cuticle. It bears unicellular root hairs.

(b)CORTEX:- It is present beneath the epidermis. It consists of many layers of parenchymatous cells with large intercellular spaces.

(c)ENDODERMIS:- It is the innermost layer of cortex. Its cells are barrel shaped with casparian strips on their antinunal walls. The passage cells are seen just opposite the protoxylem ends.

(d)PERICYCLE:- It consists of single layer of thin walled parenchymatous cells.

(e)VASCULAR BUNDLE:- The vascular bundles are radial, alternating xylem & phloem. The xylem & phloem bundles are always more than six. The xylem is exarch in condition. The central portion is occupied by large pith of parechyomatous cells. The conjuctive tissue is found between the xylem & phloem strand.



2.What is wood? What are its different types?

Ans. Botanically, a secondary xylem is called as wood. It is formed by the metabolism of the plant i.e. secondary growth by cambium & constitutes the bulk of plant body in dicot stem & dicot root. Wood can be classified into following categories.

(i) Hardwood:- It is wood produced by angiosperms. It consists mainly of xylem vessels & hence called porous wood.

(ii) Soft wood:- It is wood produced by gymnosperm. It consists mainly of xylem trachieds & hence called non-porous wood.

(iii) Heart wood:_ It is the central core of wood formed during secondary growth. It consists of dead cells. The cells are dark in color due to the presence of extractives like gums, resins, tannins, etc.

(iv) Sap wood:_ It is the peripneral part of wood formed during secondary growth. It consists of living cells. The cells are lighter in colour as extractives are absent.

(v) Early wood:- It is the wood formed during favorable season. Vessels & tracheids formed are larger in dimensions.

(vi) Late wood:- It is the wood formed during unfavorable seasons. The vessels & tracheids formed are smaller in dimensions.