

SUBJECT : BIOLOGY

QUESTION BANK

CHAPTER 06: ANATOMY OF FLOWERING PLANTS

I. ANSWER THE FOLLOWING IN ONE WORD OR IN ONE SENTENCE (1 MARK EACH):

1. Name the associated structure of companion cell.
2. Name an enucleated plant cell.
3. Name the conductory elements of xylem.
4. What is periderm?
5. What is annual ring?
6. Name the meristem which is responsible for growth in diameter of the cortex.
7. What is intrafascicular cambium?
8. What is interfascicular cambium?
9. Name the outermost layer of stele.
10. What is plant anatomy?
11. Mention the different types of meristems.
12. What is simple permanent tissue?
13. What is complex permanent tissue?
14. What are sclereids?
15. Name a dead mechanical tissue.
16. Name a living mechanical tissue.
17. Mention the components of Xylem tissue.
18. Mention the components of phloem tissue.
19. What is endarch xylem?
20. What is exarch xylem?
21. Name the outermost layer of the primary plant body.
22. What are trichomes?
23. What are casparian strips?
24. Mention the components of stele.
25. Which layer is also referred to as the starch sheath?
26. Mention the two types of parenchyma that make up the mesophyll of a dicot leaf.
27. Where are bulliform cells present?
28. Mention the various cell layers which constitute the bark.
29. What are lenticles?
30. What constitutes the stomatal apparatus?

ANSWER THE FOLLOWING IN 3-5 SENTENCES (2 MARK EACH):

1. Explain the structure of lenticel.
2. Differentiate between spring wood and autumn wood.

3. Differentiate Tracheids and Trachea.
4. Mention any two differences between cork cambium and vascular cambium.
5. What are Annual rings?
6. Explain the terms phellem and phelloderm.

ANSWER THE FOLLOWING IN 200-250 WORDS (5 MARKS EACH):

1. Explain briefly secondary growth in dicot stem.
2. Draw a neat labelled diagram of t/s young dicot stem.
3. Describe the different types of vascular bundles you have studied.
4. Describe the structure of water conducting tissue.
5. Describe the structure of phloem
6. Describe briefly simple dead mechanical tissue.
7. Draw a neat labelled diagram of the cross section of dicot stem after secondary growth.

CHAPTER SIX: ANATOMY OF FLOWERING PLANTS = ANSWERS

ANSWER THE FOLLOWING IN ONE WORD OR IN ONE SENTENCE (1 MARK EACH):

- 1A:** Sieve tube cell
- 2A:** sieve tube cell
- 3A:** Tracheary elements- Tracheids and Vessels (tracheae)
- 4A:** Phellogen, Phellum and Phelloderm are collectively called as Periderm
- 5A:** Spring wood and autumn wood that appear as alternate concentric rings constitute an annual ring.
- 6A:** Cork Cambium
- 7A:** Cells of cambium present between primary xylem and primary phloem.
- 8A:** The cells of the medullary rays, adjoining the intrafascicular cambium become meristematic to form interfascicular cambium.
- 9A:** Endodermis
- 10A:** Study of internal structure of plants.
- 11A:** apical meristem, intercalary meristem and lateral meristem.
- 12A:** The cells of the permanent tissue having all cells similar in structure and function are called simple tissues.
- 13A:** Permanent tissues having many different types of cells are called complex tissues.
- 14A:** Sclereids are spherical, oval or cylindrical, highly thickened dead cells with very narrow cavities.
- 15A:** Sclerenchyma.
- 16A:** Collenchyma.

17A: Tracheids, tracheae (vessels), xylem parenchyma and xylem fibres

18A: Sieve tubes, companion cells, phloem parenchyma, phloem fibres.

19A: the condition where protoxylem lies towards the pith and metaxylem towards periphery is called as endarch xylem.

20A: the condition where protoxylem lies towards periphery and metaxylem towards pith is known as exarch xylem.

21A: epidermis

22A: multicellular epidermal hairs on the dicot stem are known as trichomes.

23A: the tangential and the radial wall of the endodermal cells of the dicot and monocot root are deposited with impermeable waxy material, suberin. These form the casparian strips.

24A: pericycle, vascular bundles and pith.

25A: endodermis of dicot stem.

26A: spongy parenchyma and palisade parenchyma.

27A: monocot leaf epidermis.

28A: periderm (phellogen, phellum, phelloderm) and the secondary phloem.

29A: lens shaped openings in the epidermal layer or the outer most layer of the bark.

30A: stomatal aperture, guard cells, and subsidiary cells.

ANSWER THE FOLLOWING IN 3-5 SENTENCES (2 MARK EACH):

1A: LENTICEL

Diagram = 1 mark

Labelling = 1 mark; at least 4 correct labelling.

2A:

AUTUMN WOOD	SPRING WOOD
In winter the cambium is less active and forms fewer xylem elements that have narrow vessels. These are called as autumn wood or late wood	In the spring season the cambium is more active and produces a large number of xylary elements having vessels with wider/broader cavities. These are called as spring wood or early wood.

3A:

TRACHEIDS	TRACHEAE/VESSELS
These are elongated tube-like cells with thick lignified walls and tapering ends.	These are long cylindrical tube-like structures made up of many cells called vessel members.
These are dead cells with narrow lumen (central cavity).	Each vessel member has lignified walls and a large central cavity.
In gymnosperms, tracheids are the main water conducting elements.	The vessel members are interconnected through perforations in their common walls.

	Presence of vessels is a characteristic feature of angiosperms.
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4A:

VASCULAR CAMBIUM	CORK CAMBIUM
The meristematic layer that is present between the vascular tissues in a vascular bundle (of a dicot stem) is called as vascular cambium.	The meristematic layer in the cortex region developed during secondary growth in the stem is called as cork cambium.
During secondary growth it forms a cambial ring.	It is also called phellogen, and it forms phellem/cork on the outer side and phelloderm/secondary cortex on the inner side.

5A: The activity of the vascular cambium produces spring wood/early wood and autumn wood/late wood in one year during spring season and autumn season respectively. These together constitute the annual ring.

6A: Phellem: The cells outer to the phellogen layer differentiates into cork or phellem, and they have suberin depositions on their cell walls.

Phelloderm: the cells inner to the phellogen layer differentiate into secondary cortex or phelloderm, and are made up of simple parenchyma.

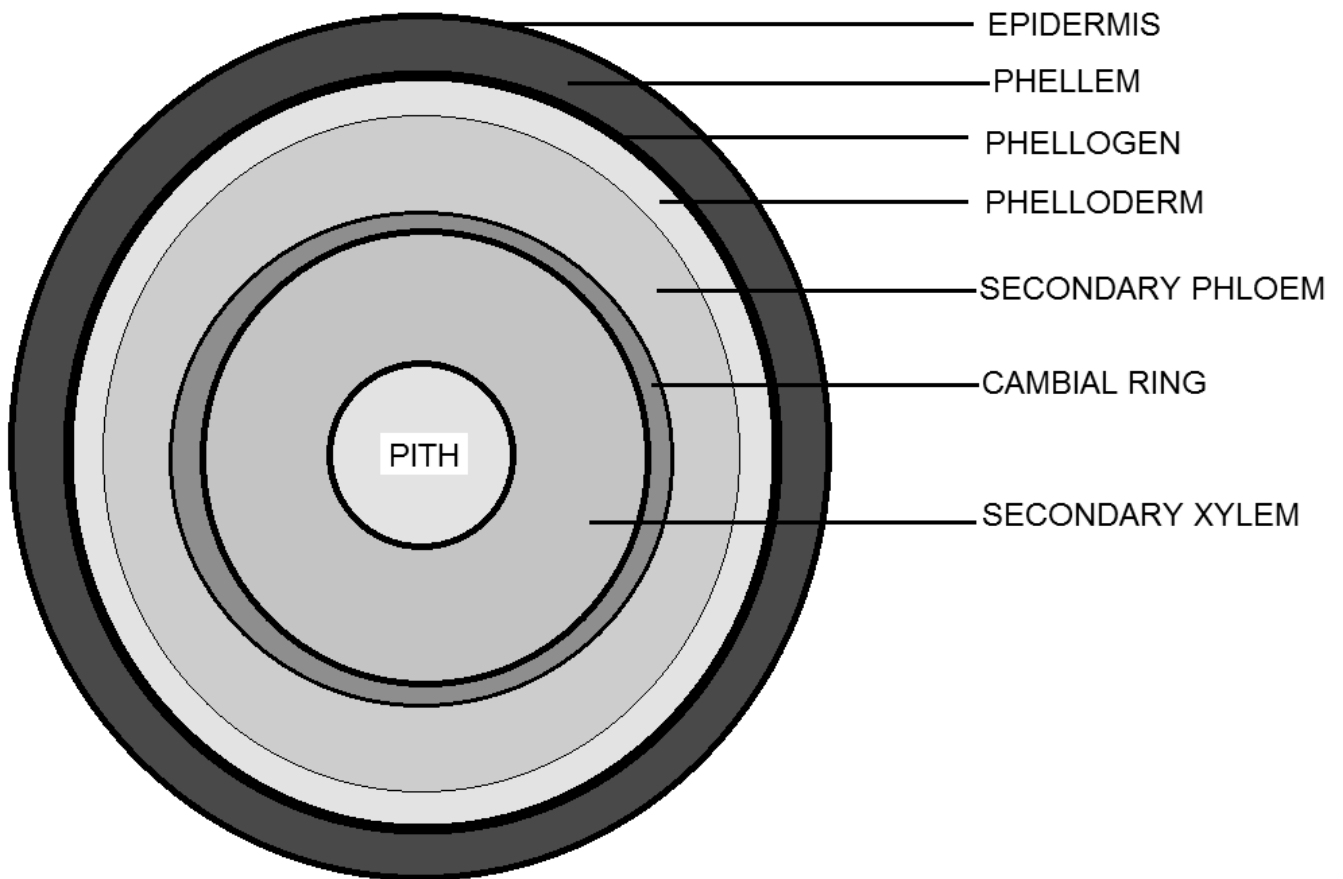
ANSWER THE FOLLOWING IN 200-250 WORDS (5 MARKS EACH):

1A: {explanation = 2 ½ marks; schematic representation = 2 ½ marks}

Most dicot plants exhibit an increase in girth as they grow older. This increase is called as secondary growth. The tissues involved in secondary growth are the two lateral meristems-vascular cambium and cork cambium.

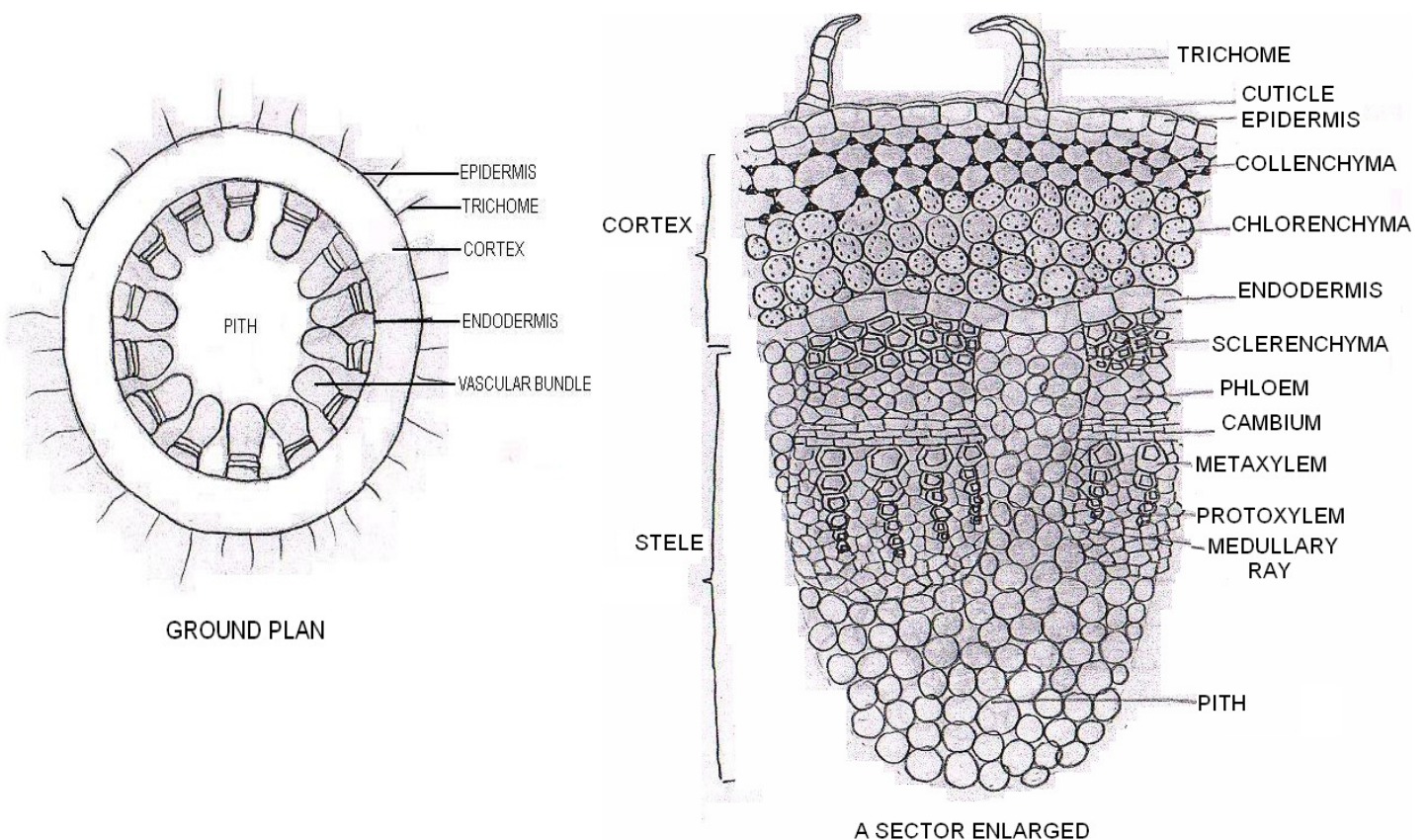
The vascular cambium present between xylem and phloem along with the cells of the medullary rays develop the cambial ring. The activity of the cambial ring produces secondary phloem and secondary xylem on either side. During spring and autumn season, cambium produces spring wood and autumn wood respectively. They together form an annual ring. The secondary xylem can be differentiated into heartwood and sapwood.

The cortical cells develop the secondary meristematic tissue called as the cork cambium or phellogen. On the outer side it gives rise to cork or phellogen. Towards the inner side it develops phelloderm or secondary cortex. Phellogen, phellem and phelloderm together constitute the periderm. At certain regions phellogen cuts off loosely arranged parenchymatous tissue on the outer side, rupturing the epidermis, forming lens shaped openings called the lenticels. These permit exchange of gases.

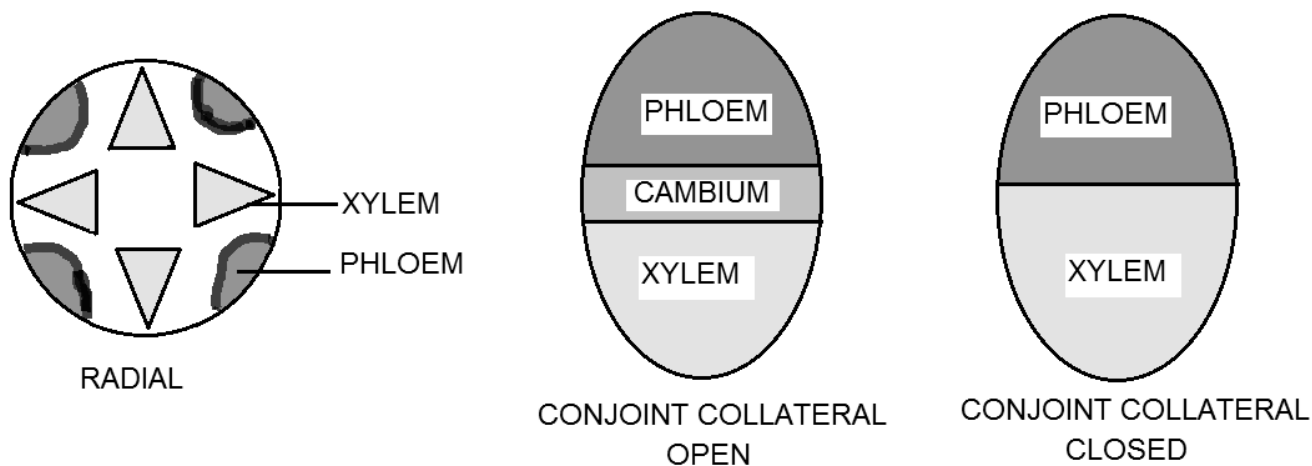


SCHEMATIC REPRESENTATION OF SECONDARY GROWTH IN A DICOT STEM

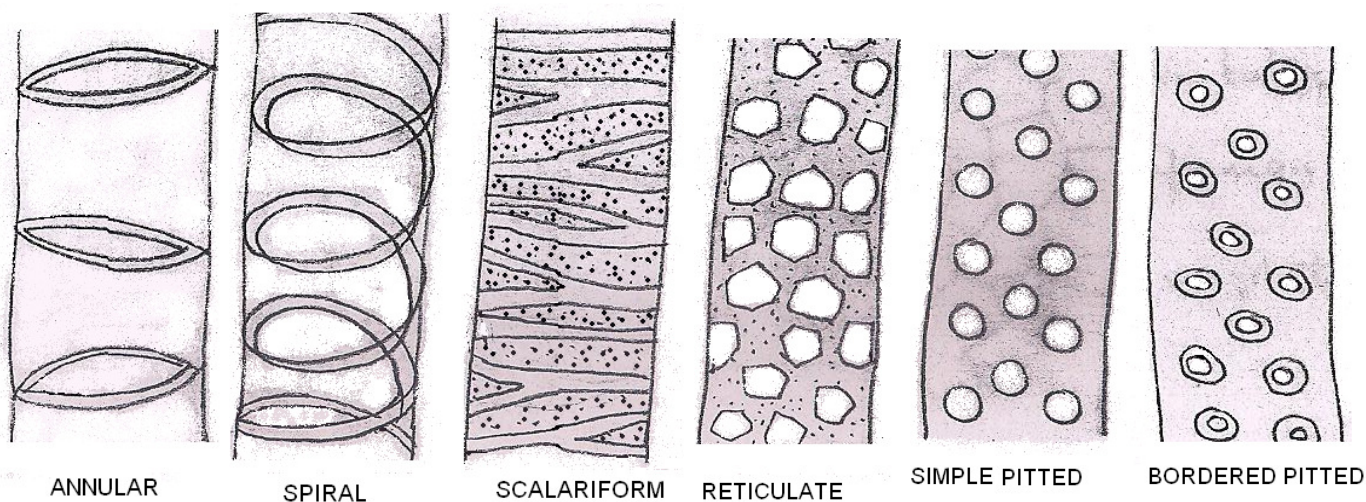
2A: Ground plan = 2 marks; at least 5 correct labelling.
Sector enlarged = 3 marks; at least 8 correct labelling.



3A: Explanation = 2 marks
Diagrams = 3 marks

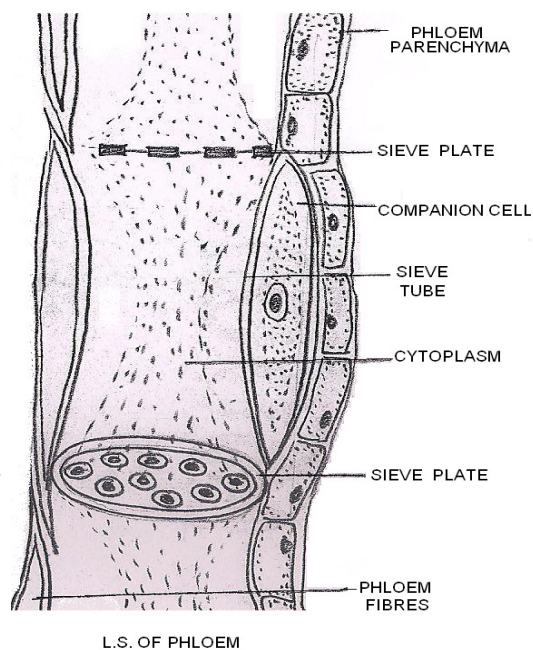
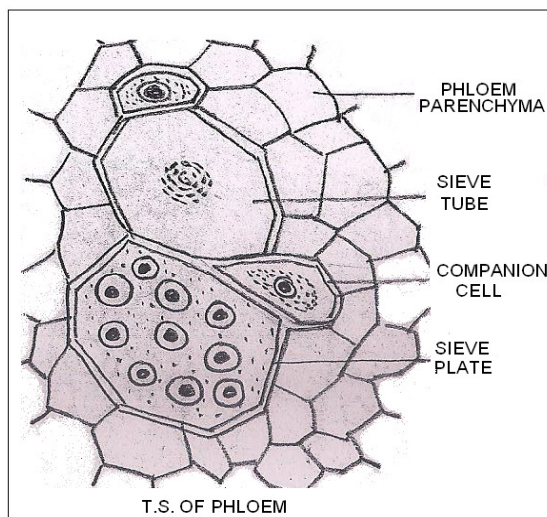


4A: Explanation = 2 marks
Diagram = 3 marks

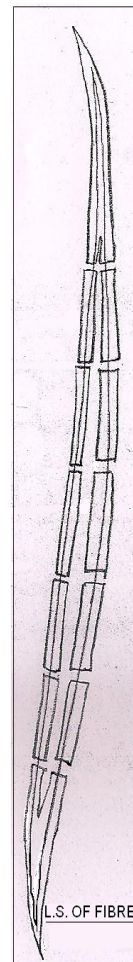
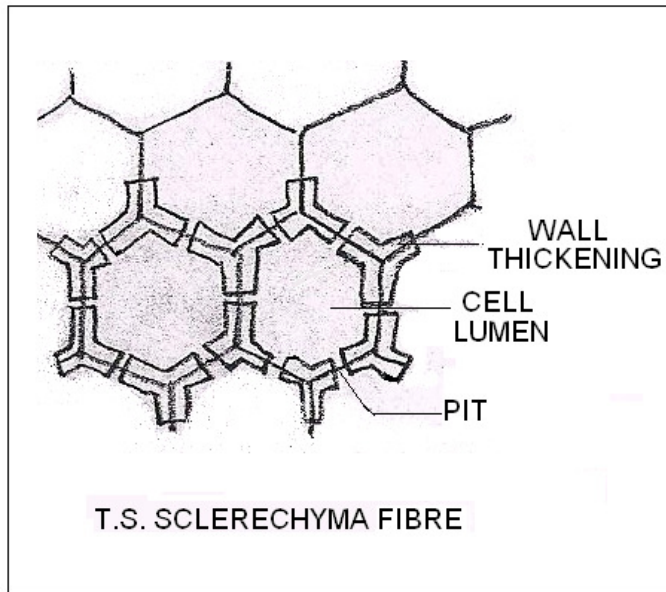


PATTERNS OF THICKENINGS IN TRACHEARY ELEMENTS

5A: Explanation = 2 marks
Diagram = 3 marks



6A: Explanation = 2 marks
Diagram = 3 marks



1. Draw a neat labelled diagram of the cross section of dicot stem after secondary growth.
- 7A:** Diagram = 2 marks
Labelling = 3 marks; at least 6 correct labelling.

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