

CHAPTER 6

ANATOMY OF FLOWERING PLANTS



CLASS 11TH

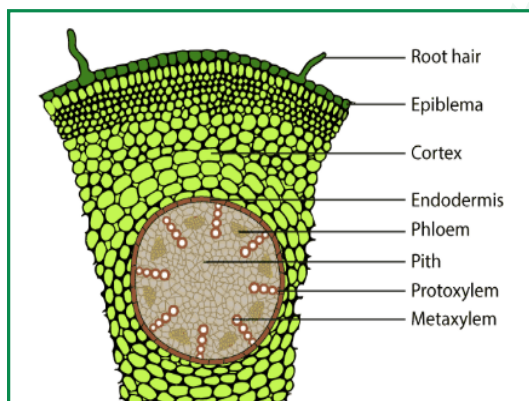
NCERT EXERCISE AND SOLUTIONS - BIOLOGY

Q. 1. Draw illustrations to bring out the anatomical difference between

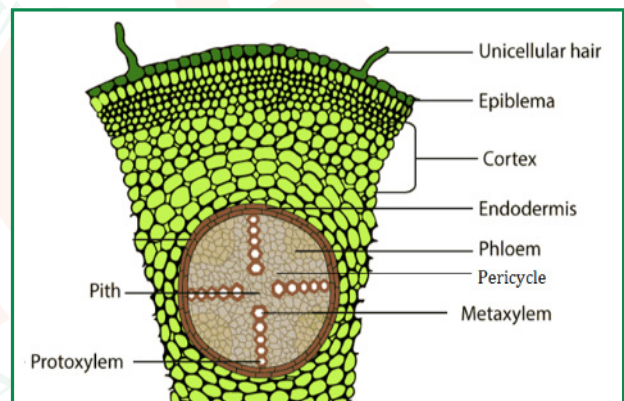
- (a) Monocot root and Dicot root
- (b) Monocot stem and Dicot stem

ANSWER:-

- (a) Monocot root and Dicot root

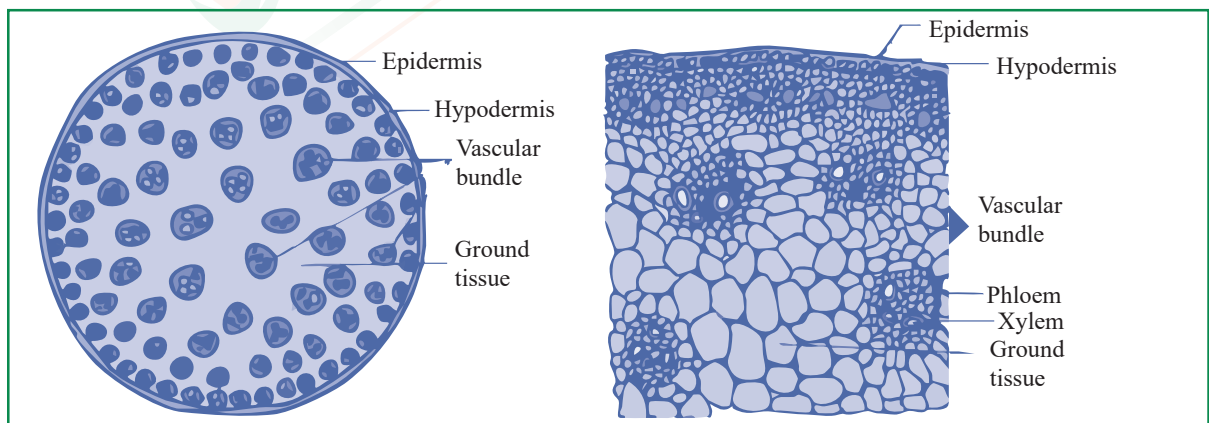


Monocot root



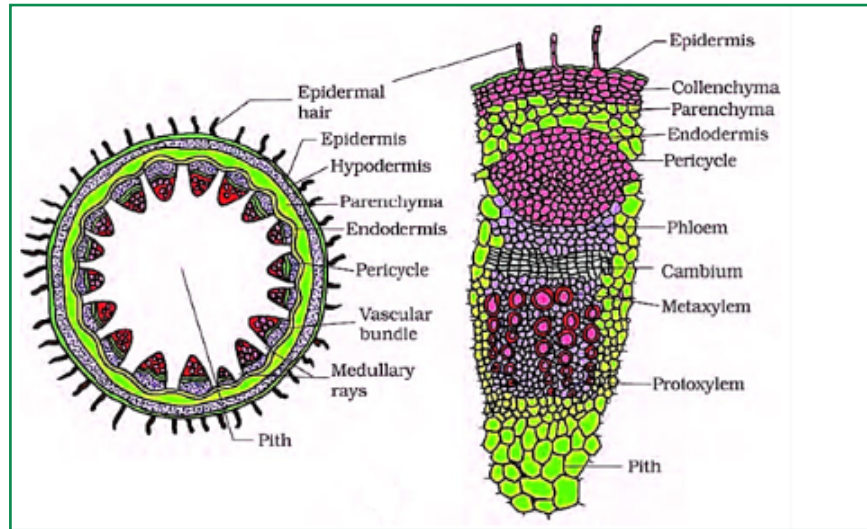
Dicot root

- (b) Monocot stem and Dicot stem



Monocot stem





Dicot stem

Q. 2. Cut a transverse section of young stem of a plant from your school garden and observe it under the microscope. How would you ascertain whether it is a monocot stem or a dicot stem? Give reasons.

ANSWER:-

Dicot Stem	Monocot stem
Vascular bundles are arranged in a ring formation	Vascular bundles are scattered throughout
Vascular bundles are open	Vascular bundles are closed and surrounded by a bundle sheath
Vascular bundles are collateral, conjoint, and open, with a cambium strip between xylem and phloem	Vascular bundles are collateral, conjoint, and closed, dispersed within ground tissue containing parenchyma
Ground tissue is differentiated into parenchyma, collenchyma, endodermis, pith, and pericycle, with medullary rays between vascular bundles	Phloem parenchyma is absent, and water-filled cavities are present

Q. 3. The transverse section of a plant material shows the following anatomical features - (a) the vascular bundles are conjoint, scattered and surrounded by a sclerenchymatous bundle sheaths.

(b) phloem parenchyma is absent. What will you identify it as?

ANSWER:-

The transverse section of a monocot stem shows that vascular bundles are dispersed throughout. Additionally, phloem parenchyma is absent in monocot stems.

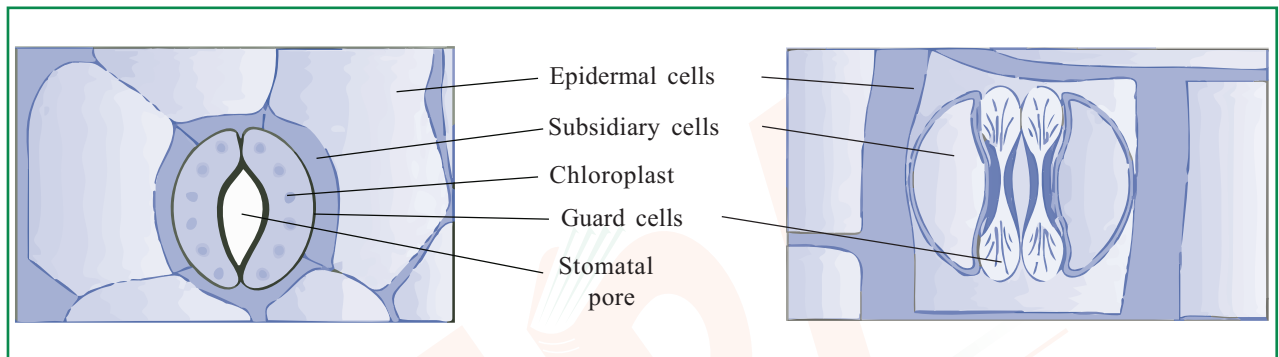


Q. 4. What is stomatal apparatus? Explain the structure of stomata with a labelled diagram.

ANSWER:-

Stomata are structures found in the epidermis of leaves that control transpiration and gas exchange. Each stoma consists of two bean-shaped guard cells that surround the stomatal pore.

The guard cells are dumbbell-shaped, with thin outer walls and thickened inner walls. These cells contain chloroplasts and are responsible for regulating the opening and closing of the stomata. In some cases, the epidermal cells adjacent to the guard cells are specialized in structure, shape, and size, and are known as subsidiary cells. The guard cells, stomatal pore, and surrounding subsidiary cells together form the stomatal apparatus.



Q. 5. Name the three basic tissue systems in the flowering plants. Give the tissue names under each system.

ANSWER:-

The three fundamental tissue systems in flowering plants are:

Epidermal Tissue System

This system consists of the epidermis and its appendages. The epidermis is made up of epidermal cells and guard cells, while the epidermal appendages include root hairs, stem hairs, stinging hairs, and glandular hairs.

Ground Tissue System

The ground tissue system is composed of simple tissues like parenchyma, collenchyma, and sclerenchyma.

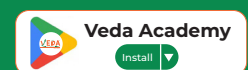
Vascular Tissue System

The vascular tissue system comprises complex tissues such as xylem, phloem, and vascular cambium.

Q. 6. How is the study of plant anatomy useful to us?

ANSWER:-

- The study of plant anatomy provides several benefits, including:
- Understanding how plants adapt structurally to various climatic conditions.



- Assisting in the identification of monocots, dicots, and gymnosperms.
- Enabling the study of physiological conditions, which aids in crop improvement.
- Facilitating the commercial use of plant fibers like flax and jute by predicting the strength of wood, allowing for its optimal utilization.

Q. 7. Describe the internal structure of a dorsiventral leaf with the help of labelled diagrams.

ANSWER:-

Dicots have dorsiventral leaves. A vertical section of a dorsiventral leaf reveals three distinct parts:

- **Epidermis:** Present on both the adaxial (upper) and abaxial (lower) surfaces. The epidermis is covered by a thick cuticle on the outside, with a higher number of stomata on the abaxial surface compared to the adaxial surface.
- **Mesophyll:** Located between the adaxial and abaxial epidermis, the mesophyll is divided into two types: palisade mesophyll and spongy mesophyll. The palisade mesophyll consists of tall, tightly packed cells, while the spongy mesophyll contains round or oval, loosely arranged cells with intercellular spaces. The mesophyll contains chloroplasts, which are responsible for photosynthesis.
- **Vascular system:** The vascular bundles in leaves are closed and conjoint, surrounded by a thick layer of bundle-sheath cells.

