Plant Tissue

(English Medium)

Exercise 77:

Solution 1.1:

D. Complex tissue
Tissues containing more than one type of cells are known as complex tissue. Xylem and phloem are two important complex tissues in plants.

Solution 1.2:

C. Chlorenchyma
Chlorenchyma tissues perform the function of photosynthesis in plants.

Solution 1.3:

B. Hypodermis
Collenchyma tissue is mainly found below the epidermis and hence, it forms the hypodermis.

Solution 1.4:

B. Transport of food
Phloem is a complex tissue in plants, mainly concerned with transport of food material from leaves to different parts of the plant.

Exercise 78:

Solution 1.5:

C. Xylem parenchyma
Xylem parenchyma stores food and conducts water sideways in xylem tissues. It is the only living component of xylem tissue.

Solution 1.6:

D. Phloem fibre
Phloem fibre is the only dead component of phloem tissue. Other components are living cells.

Solution 1.7:

Collenchyma
Collenchyma provides mechanical strength and also renders elasticity to different parts of the plant. Hence, it is known as living mechanical tissue.

Solution 2.1:

Tissue is defined as a group of cells that have similar structure and that work together in coordination to perform a specific function.

Solution 2.2:

Three simple permanent tissues of plants are:

- Parenchyma
- Collenchyma
- Sclerenchyma

Solution 2.3:

The components of phloem are:

- Sieve cells
- Sieve tubes
- Companion cells
- Phloem fibres
- Phloem parenchyma

Solution 2.4:

The components of xylem are:

- Tracheids
- Vessels of tracheae
- Xylem parenchyma
- Xylem fibres

Solution 2.5:

The function of phloem is to conduct organic food material from green parts of the plant to the other parts of the plant.

Solution 2.6:

Deposition of pectin is present in collenchyma cells.

Solution 2.7:

Lateral meristem helps in secondary growth in plants.

Solution 2.8:

Characteristics of meristematic tissue are:

- They are constantly dividing cells.
- They produce new cells and help in growth.
- They are compactly arranged cells and intercellular spaces are absent.
- Cytoplasm is present in abundance.
- Nucleus is large and prominent in cells of meristematic tissues.

Solution 3.1:

Complex tissues are those tissues that posses more than one type of cell.
Xylem is composed of tracheids, vessels of tracheae, xylem parenchyma and xylem fibres.
Thus, xylem is a complex tissue.

Solution 3.2:

Collenchyma	Chlorenchyma
Collenchyma cells are found beneath the epidermis and form hypodermis.	Chlorenchyma cells are found in the green part of the plants.
They contain pectin deposition.	They show the presence of chloroplast containing chlorophyll.
Collenchyma provides mechanical support and also, renders elasticity and flexibility to plant parts.	Chief function of chlorenchyma is photosynthesis.

Solution 3.3:

Xylem	Phloem
Xylem conducts water and dissolved salts upwards from the roots to the other parts of the plant.	Phloem conducts organic food material from the leaves to the other parts of the plant.
Xylem is composed of tracheids, vessels of tracheae, xylem parenchyma and xylem fibres.	Phloem is composed of sieve cells, sieve tubes, companion cells, phloem fibres and phloem parenchyma
The components of xylem are dead cells except xylem parenchyma.	The components of phloem are living cells except phloem fibres.

Solution 3.4:

Parenchyma	Sclerenchyma

Parenchyma is made up of thin walled living cells.	Sclerenchyma is made up of thick walled dead cells.
Intercellular spaces are present.	Intercellular spaces are absent.
Parenchyma functions to store organic food, other nutrients and water.	Sclerenchyma functions to provide mechanical support to the plants.

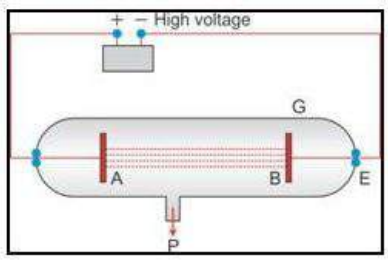
Solution 3.5:

Functions of parenchyma are:

- It provides support to plants.
- It stores organic food, other nutrients and water.
- It also stores tannins, gums, resin and other useful inorganic substances.
- It acts as a ground tissue by filling up the spaces between different tissues.
- As chlorenchyma, it performs the function of photosynthesis.
- As aerenchyma, it provides buoyancy to the plants.

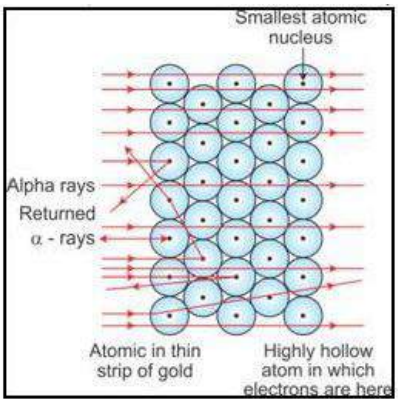
Solution 3.6:

Xylem is a complex permanent tissue in plants.
It is composed of tracheids, vessels of tracheae, xylem parenchyma and xylem fibres.
The components of xylem are dead cells except xylem parenchyma.
Function:
Chief function of xylem is to conduct water and dissolve minerals upwards from roots to the other parts of the plant.
Tracheids are unicellular and tracheae are multicellular tubular structures that allow transport of water and minerals vertically.
Xylem parenchyma stores food and facilitates sideways conduction of water.
Xylem fibres provide mechanical strength to the plants.



Solution 3.7:

Phloem is a complex permanent tissue in plants.
It is composed of sieve cells, sieve tubes, companion cells, phloem fibres and phloem parenchyma.
Sieve tubes are tubular structures. The transverse walls of the sieve tubes are perforated and are called as sieve plates.
The components of phloem are living cells except phloem fibres.
Function:
The chief function of phloem tissue is to translocate organic food prepared by leaves to other parts of the plant.
Phloem fibres provide mechanical support to the tissue.



Solution 3.8:

Meristematic tissues are the tissues where the cells are constantly dividing. They produce new cells and help in the growth of the plants. Depending on the position of the tissues, meristematic tissues are of three types:

- Apical meristem: Apical meristem is the meristematic tissues present at the apical parts of the plants like root tips and shoot tips. As the meristem produces new cells, the growth of the plant part just below the tips takes place. Thus, the length of the roots and shoots will grow. This is also known as primary growth of plants.
- Lateral meristem: Lateral meristem is the meristematic tissue present in the lateral parts of the plants. They help in secondary growth of plants. The increase in the girth of plants is an example of secondary growth in plants.
- Intercalary meristem: Intercalary meristem is the meristematic tissues present at the internodal parts of the plants. They are present between the masses of permanent tissues. They are seen at internodes and in sheathing leaf bases of grasses. Intercalary meristem is short lived and soon merges with the permanent tissues.

Solution 3.9:

Sclerenchyma is a tissue made up of dead cells.
During the formation of the tissue, the cytoplasm and the nucleus of the cells disintegrate; the primary wall of the cell made up of cellulose becomes thick along with lignin and forms a secondary wall.
The lumen of the cells of sclerenchyma is reduced.
Sclerenchyma cells is of two types:

- Sclerenchyma fibres – long, narrow, fibre-like cells found in the stem around vascular bundles and in veins of leaves.
- Sclerides or stone cells – isodiametric or variously shaped cells found in the outer seed coat of bean, pea, green gram and nuts and in the pulp ofchikoo and pear.

Function:

Sclerenchyma tissue makes plant hard and stiff.

It provides mechanical strength to the plants.

Solution 3.10:

The cells of collenchyma are spherical, polygonal or oval in shape.
The cell wall of collenchyma cells is made up of cellulose and also shows pectin deposition.

Intercellular spaces between the cells of collenchyma are generally absent.
They are found beneath the epidermal layer, thus, forming hypodermis.
Function:It provides mechanical strength to the organs.
It also renders elasticity and flexibility to the organs.