Chapter 3. Tissues: Plant And Animal Tissues

Exercise 1

Solution A.

1. (c) Parenchyma
2. (a) Fibrous connective tissue
3. (a)Meristem- Actively dividing cells

Solution B.1.

(a) Apical or terminal meristematic tissue
(b) Protective tissue
(c) Columnar epithelium (Epithelial tissue)
(d) Ligament (Connective tissue)
(e) Conducting tissue
(f) Sclerenchyma (Supporting tissue)

Solution B.2.

Sclerenchyma composed of long, narrow and thick cells, which have become dead, forms the least specialized tissue in plants. This tissue forms the walls and boundaries of plant cells and provides strength to tissue plant parts.

Solution B.3.

(a) Tissue
(b) Permanent tissue cells
(c) Cambium

Solution B.4.

(a) Tips of roots
(b) Nose
(c) Lining of mouth
(d) Veins of leaves
(e) Lining of trachea
(f) Bones

Solution B.5.

(a) Squamous epithelium
(b) Cuboidal epithelium
(c) Neuron
(d) Ciliated columnar epithelium

Solution C.1.

Ciliated columnar epithelium is found in the lining of trachea. This epithelium has thread-like projections called cilia at their free ends. The cilia constantly keep lashing and move the materials which enter this organ.

Solution C.2.

Nervous tissue or neurons are specialized group of cells. This tissue is concerned with perception and responses of animals.
The nervous tissue constitutes the nervous system, which is an organ system. It controls and coordinates all the systems of the body.

Solution C.3.

1. Muscular tissue (Cardiac muscles)
2. Epithelial tissue (Lining of blood vessels of the heart)
3. Connective tissue (Fluid connective tissue in the form of red blood corpuscles)

Solution C.4.

A tissue is a group of similar cells from the same origin that together carry out a specific function. An egg is a zygote or a cell but a cluster of eggs cannot be considered as a tissue as it does not form an organ like a tissue. Instead it gives rise to a new individual organism if gets fertilised.

Solution C.5.

1. **Striated muscles:** Provide the force for locomotion and all voluntary movements of the body. These muscles are found in the limbs.
2. **Unstriated muscles:** Provide movements for the passage of food in the intestines. These muscles are found in iris of the eye, lining of blood vessels, urinary bladder, etc.
3. **Cardiac muscles:** Provide rhythmic contraction and relaxation movements. These muscles are found only in the heart.

Solution D.1.

(a) Cell and tissue

Cell	Tissue
A cell is the structural and functional unit of all living beings. E.g. epithelial cell	A tissue is a group of similar cells which perform a specific function. E.g. nervous tissue

(b) Organ and organism

Organ	Organism

Several tissues together contribute to specific functions inside the body and constitute an organ. E.g. stomach	Several organ systems together constitute the organism. E.g. human being

(c) Organ and organelle

Organ	Organelle
Several tissues together contribute to specific functions inside the body and constitute an organ. E.g. stomach	Parts of the cell that have a definite function in the cell. E.g. mitochondria

(d) Organ and organ system

Organ	Organ system
Several tissues together contribute to specific functions inside the body and constitute an organ. E.g. stomach	Many organs act together to perform a specific life process and constitute an organ system. E.g. digestive system

Solution D.2.

(a) Parenchyma and Collenchyma

Parenchyma	Collenchyma
(i) Consists of large thin-walled living cells with a single large vacuole (ii) Intercellular spaces may or may not be present	(i) Consists of elongated cells having thickening in their cell walls (ii) Intercellular spaces are totally absent

(b) Meristematic tissue and Permanent tissue

Meristematic tissue	Permanent tissue
(i) Have the capacity to divide (ii) Do not have intercellular spaces	(i) Have lost the capacity to divide (ii) Have large intercellular spaces

(c) Sclerenchyma and Parenchyma

Sclerenchyma	Parenchyma
(i) Consist of dead cells (ii) Have thick cell walls	(i) Consist of living cells (ii) Have thin cell walls

(d) Cells of involuntary muscle and voluntary muscle

Cells of involuntary muscle	Cells of voluntary muscle
(i) Small and spindle-shaped	(i) Long and cylindrical
(ii) Uninucleate	(ii) Multinucleate
(iii) Lack stripes or striations	(iii) Show stripes or striations
(iv) Found in the walls of the intestine and lining of blood vessels	(iv) Found in the arms, legs, face and neck

(e) Fibres of voluntary muscle and cardiac muscle

Fibres of voluntary muscle	Fibres of cardiac muscle
(i) Long and cylindrical	(i) Short and branched
(ii) Multinucleate	(ii) Uninucleate
(iii) Under the control of one's own will or volition	(iii) Not under the control of one's own will or volition
(iv) Found in the arms, legs, face and neck	(iv) Found in the heart

Solution E.1.

(a) The given diagram is of the phloem tissue because the cells show cellular contents unlike the xylem tissue which contains hollow cells without any cellular contents.
(b)
1 → Sieve cell
2 → Phloem parenchyma cell
3 → Companion cell
4 → Sieve plate
(c) The phloem is a food-conducting tissue and is likely to be found in the leaves and stem of plants to carry the food manufactured in the leaves to various parts of the plant.
(d)
1 → Sieve cells: Help in the transport of food from leaves to storage organs and other parts of the plant.

2 → Phloem parenchyma cells: Storage of starch, fat and other organic food material.
3 → Companion cells: Help in the functioning of the sieve tube cells.
4 → Sieve plate: Perforations in the sieve plates allow water and dissolved organic solutes to flow along the sieve tube.

Solution E.2.

(a) The given diagram shows a nerve cell or neuron.
(b)
1 → Dendrites/Dendrons
2 → Axon
3 → Nucleus
4 → Cyton/Perikaryon
5 → Neurolemma
6 → Axon endings
(c) The nerve cell is likely to be found in the nervous system of the human body. The function of the nerve cell is to transmit messages from one part of the body to another. It is associated with perception and responses of animals.