Std IX. BIOLOGY

Instructions-- Read the chapter. Then read the summary given below. Solve the exercise.

Chapter 3

Tissues

A tissue is a group of similar cells performing a specific function and have common origin.

Plant tissur-Plants have two types of tissues i.e. meristematic tissue and permanent tissue.

1Meristematic tissue—These have ability to divide actively.

- **Location—**Apical meristem found at the shoot tip and root tip. Intercalary meristem found at the base of nodes , internodes and leaves. Lateral meristem is found in between the bark and the wood.
- **Characteristics—**Cells are living , small, compactly arranged with thin cell wall and large nuclei. Cells are actively dividing and are undifferentiated.

2Permanent tissue—Lost the ability to divide, may be dead or alive.

- **Protective plant tissue—**Epidermis consists of cells with thick walls . It is the outermost protective tissue of plant. They secrete cutin and wax which act as water proof.
- **Supportive plant tissue-**
- **Parenchyma-** found in cortex , pith and leaf mesophyll. Cells are thin walled, with single large vacuole. They provide rigidity to the plant. They may store food.
- **Collenchyma—**elongated cells with thickenings at the corners Of the cells. They are found in the leaf stalks. They provide rigidity and elasticity.
- **Sclerenchyma—** They are long, narrow , dead cells. Cell walls are thick due to lignin deposition. Occur in stems and veins of leaves. They provide mechanical strength.

3Conducting tissue—

- **Xylem tissue—**It forms a continuous conducting channel from roots to leaves. They are concerned with ascent of sap and also provide mechanical strength.
  Xylem vessels and tracheids are concerned with ascent of sap. Xylem fibres give mechanical strength. Xylem parenchyma, the only living component of xylem, stores food.
- **Phloem tissue—**They conduct food from leaves to different parts of plant. Basic components of phloem are:- sieve tubes:- elongated cells placed end to end forming a long tube. The transverse walls are perforated and called sieve plates. They conduct food. Companion cells :- living parenchyma cells, associated with sieve tubes. They help in functioning of sieve tubes. Phloem parenchyma:- associated with phloem, concerned with storage of organic food. Phloem fibres :- sclerenchyma tissue , they provide support.

Meristematic tissue

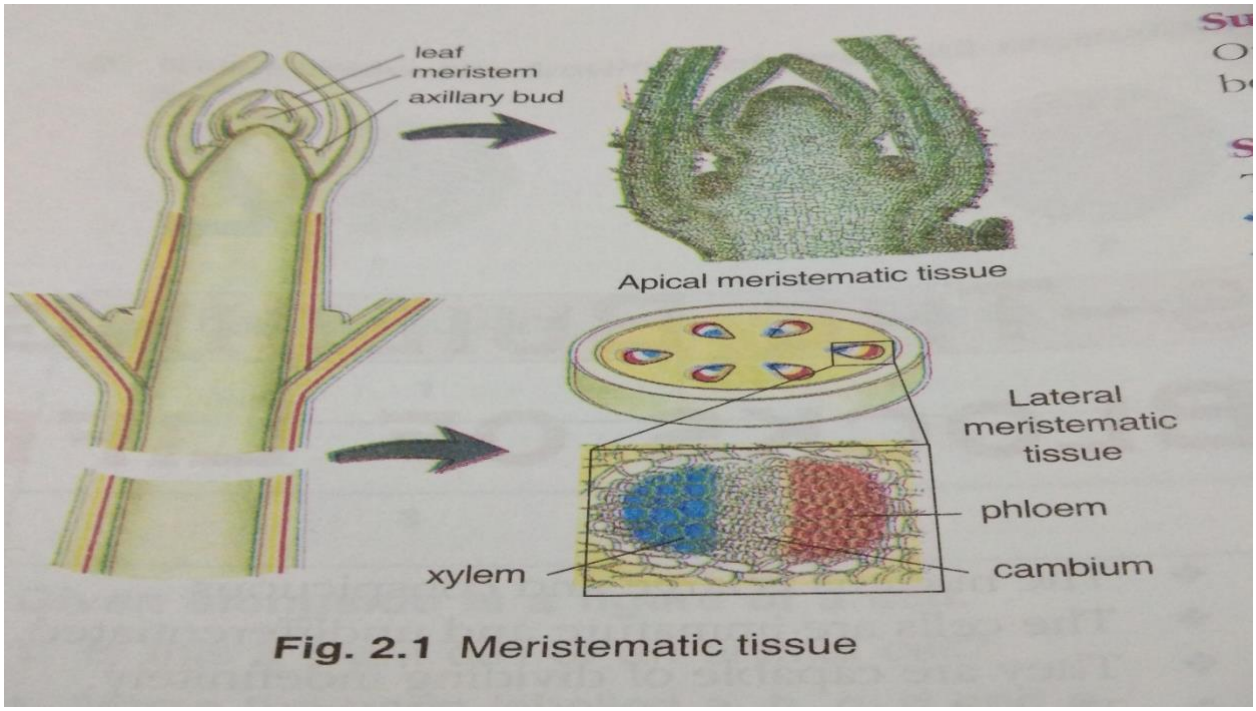

Fig. 2.1 Meristematic tissue

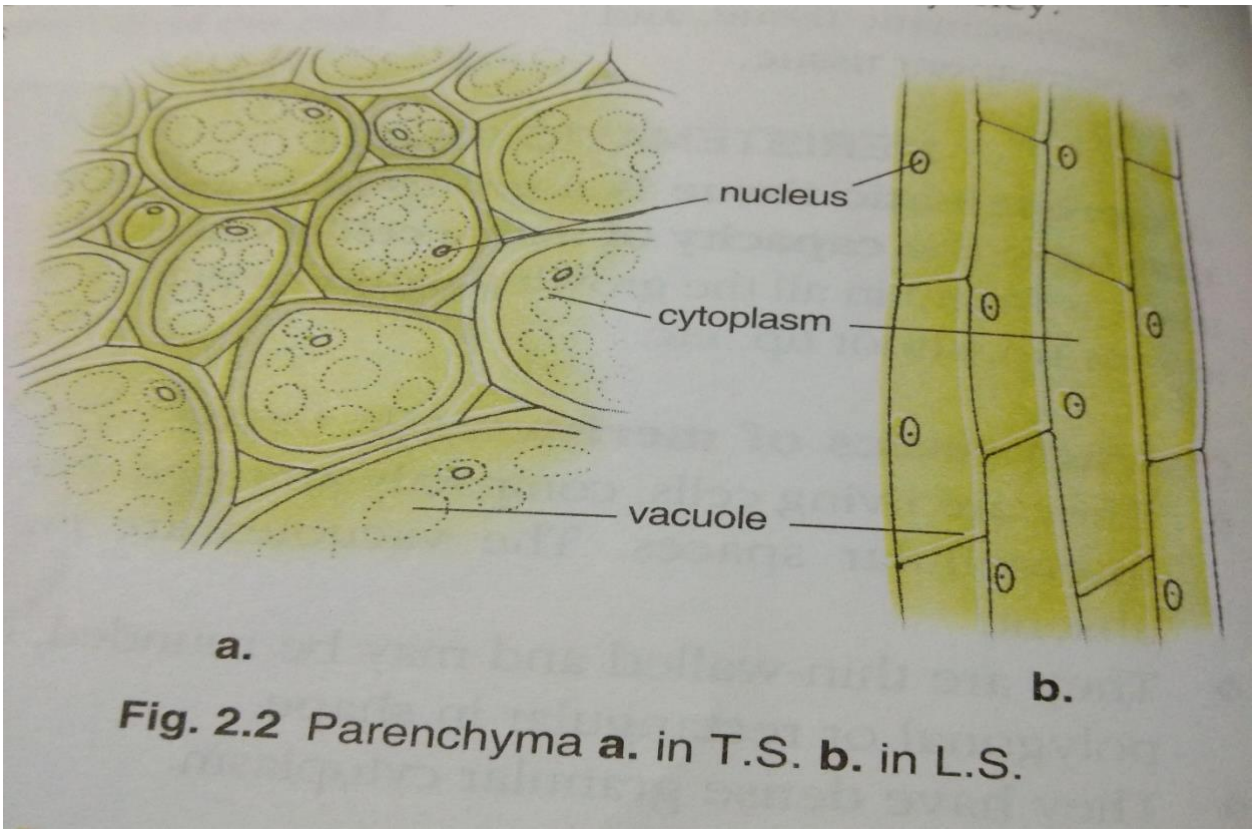

Fig. 2.2 Parenchyma **a.** in T.S. **b.** in L.S.

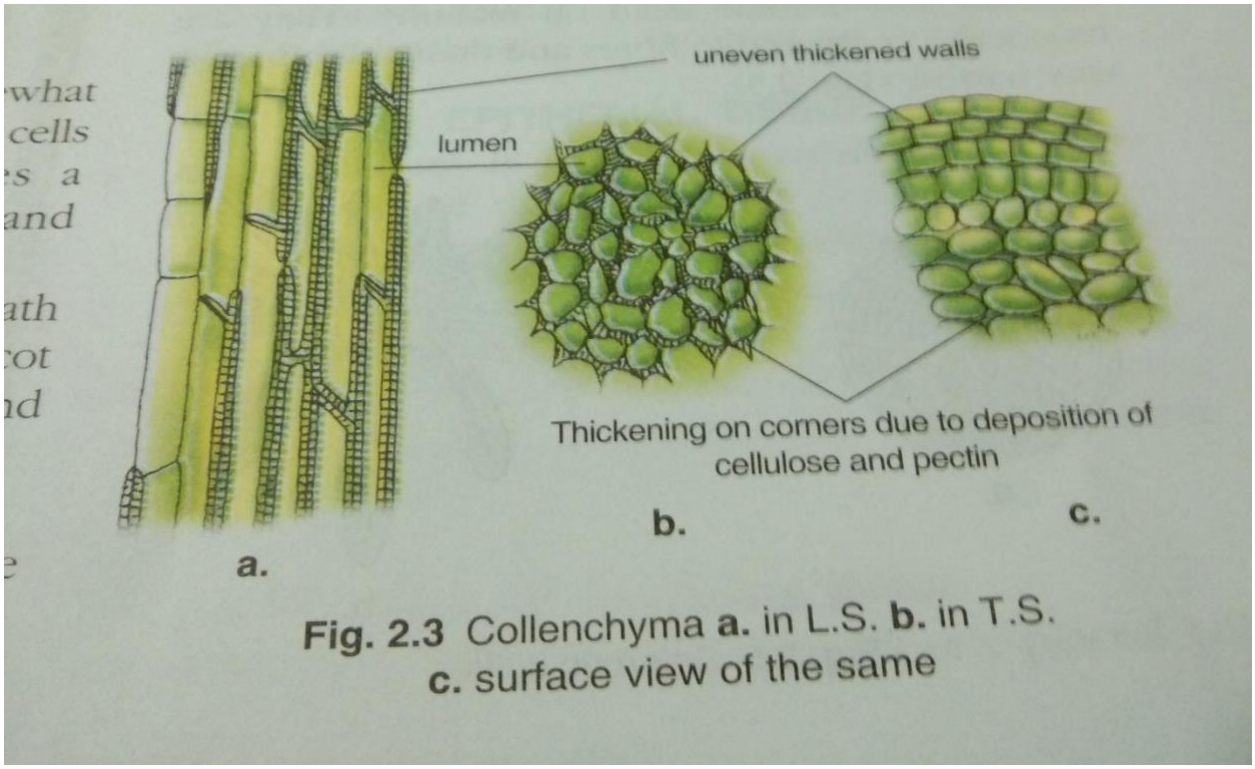

Fig. 2.3 Collenchyma **a.** in L.S. **b.** in T.S. **c.** surface view of the same

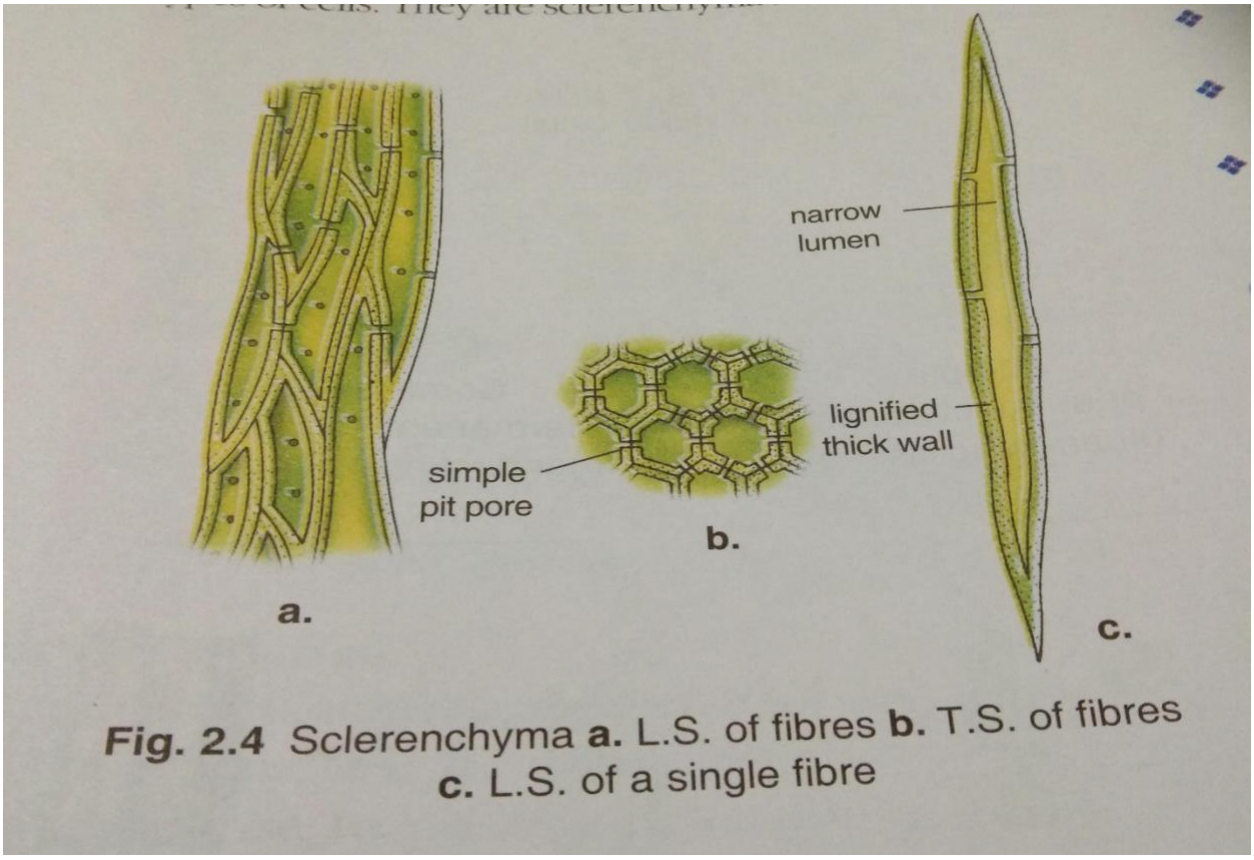

Fig. 2.4 *Sclerenchyma* **a.** L.S. of fibres **b.** T.S. of fibres **c.** L.S. of a single fibre

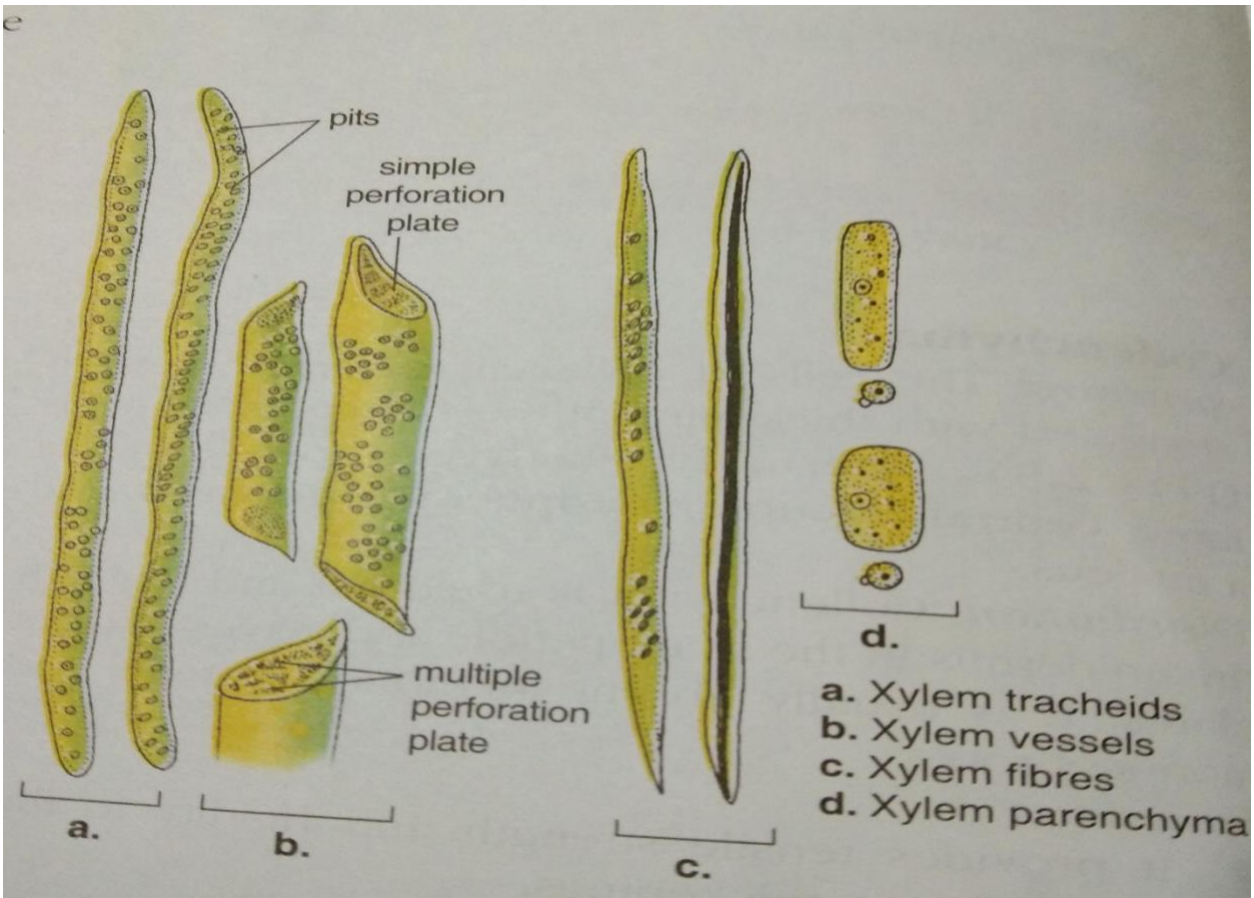

Fig. 2.6 Xylem tissue

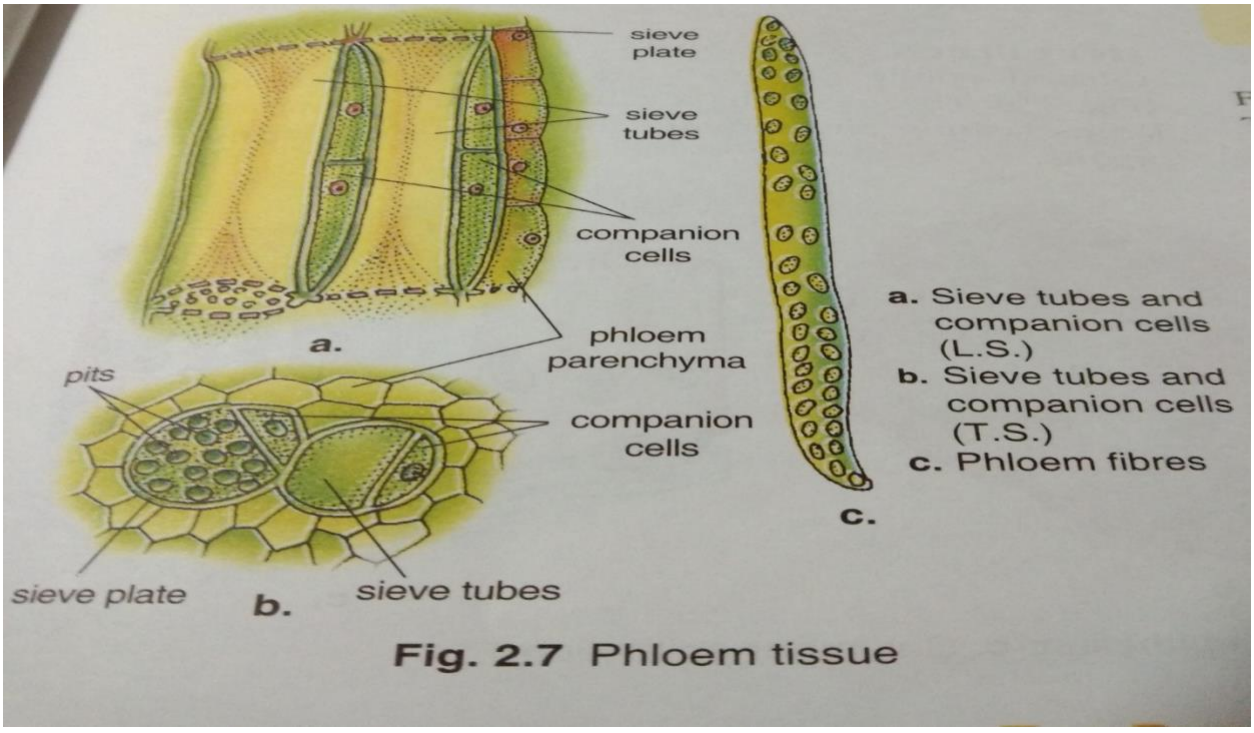

Fig. 2.7 Phloem tissue

ANIMAL TISSUE

Animal tissues are of 4 kinds- epithelial tissue , connective tissue , muscle tissue and neural tissue.

1 Epithelial tissue→ thin , protective, continuous sheet of cells.

Location—covers the external surface of the body and lining of internal body organs.

Function-- protection , absorption , secretion , sensory perception.

Types of epithelial tissue

- **Squamous epithelial tissue**—composed of flattened , polygonal cells which are closely fitted. It lines the mouth , nasal cavities , blood vessels etc .
- **Cuboidal epithelium—**made up of cuboidal cells, present in kidney tubules , sweat glands and salivary glands.
- **Columnar epithelium—**formed of pillar like or brick like cells. Found in the inner lining of stomach and intestines. In the lining of trachea , columnar epithelium is ciliated. The cilia keeps lashing to remove the foreign substances.
  Glandular columnar epithelium secrete chemicals. Found in the lining of the stomach.

Stratified epithelium – cells are arranged in several layers. Found in skin and cornea.

2 Connective tissue→ binds tissues and connects organs .

Characteristics— abundance of matrix

Fewer cellular elements.

Fibres are present.

- **Connective tissue proper—Areolar tissue –** is widely distributed , found beneath the epidermis of skin. **Adipose tissue --** forms padding under the skin , cells store fat and provides insulation.
- **Fibrous connective tissue—Tendons** connects muscles with bones and **ligaments** connects bone with bone.
- **Supportive connective tissue—cartilage**- non porous tissue, no blood or nerve supply , semi transparent and elastic. Cells are chondrocytes. **Bones—**porous tissue , good supply of blood and nerves , rigid and opaque. Cells are osteocytes.
- **Fluid connective tisssue—**consist of blood and lymph.

3 Muscle tissue→ muscles contracts and relax to make the bones to move.

- **Striated muscles—**consist of long narrow , cylindrical , unbranched fibres. Cytoplasm shows alternate light and dark bands. They are voluntary in action.
- **Unstriated muscles—**cells are spindle shaped and are arranged in bundles. They are involuntary in action.
- **Cardiac muscles—**muscles are short , striated and branched. Exclusively present in the heart.

4 Nervous tissue→ consist of neurons. A typical neuron consist of cyton , axon , dendrons and dendrites. Cyton has a prominent nucleus and cytoplasm. From cyton arises dendrons and dendrites.

One of the branch is comparatively long , this branch is called axon. Axon terminates into axon endings. A fine gap between axon ending and dendrite of next neuron is called synapse.

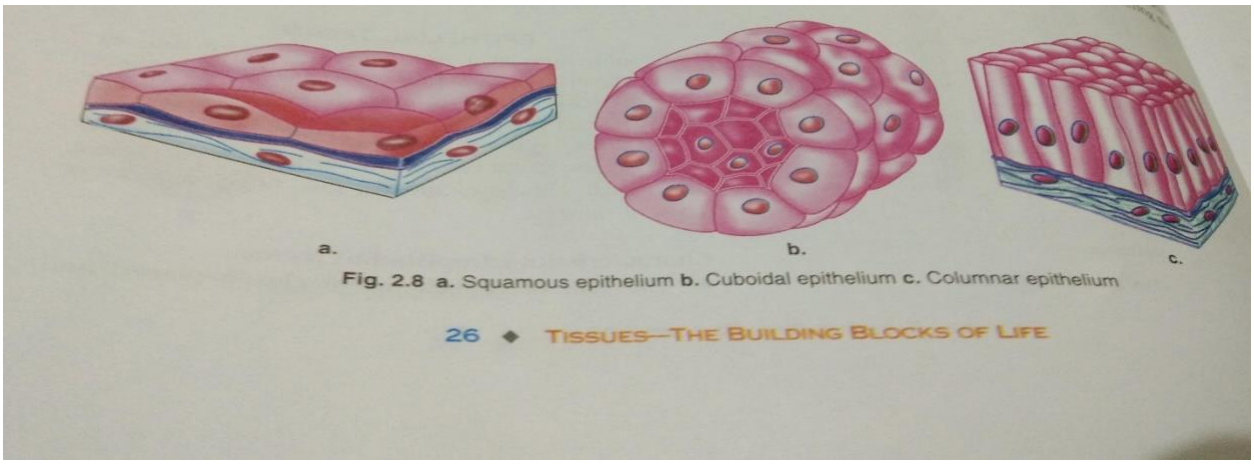

Fig. 2.8 a. Squamous epithelium b. Cuboidal epithelium c. Columnar epithelium

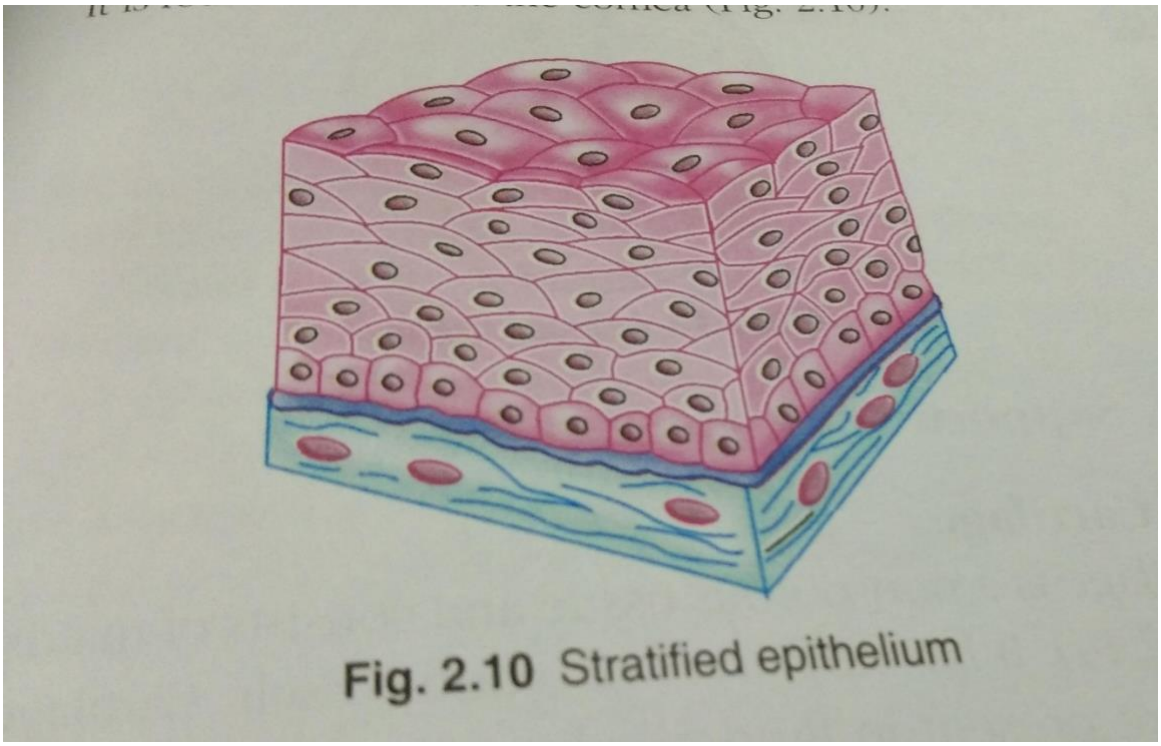

Fig. 2.10 Stratified epithelium

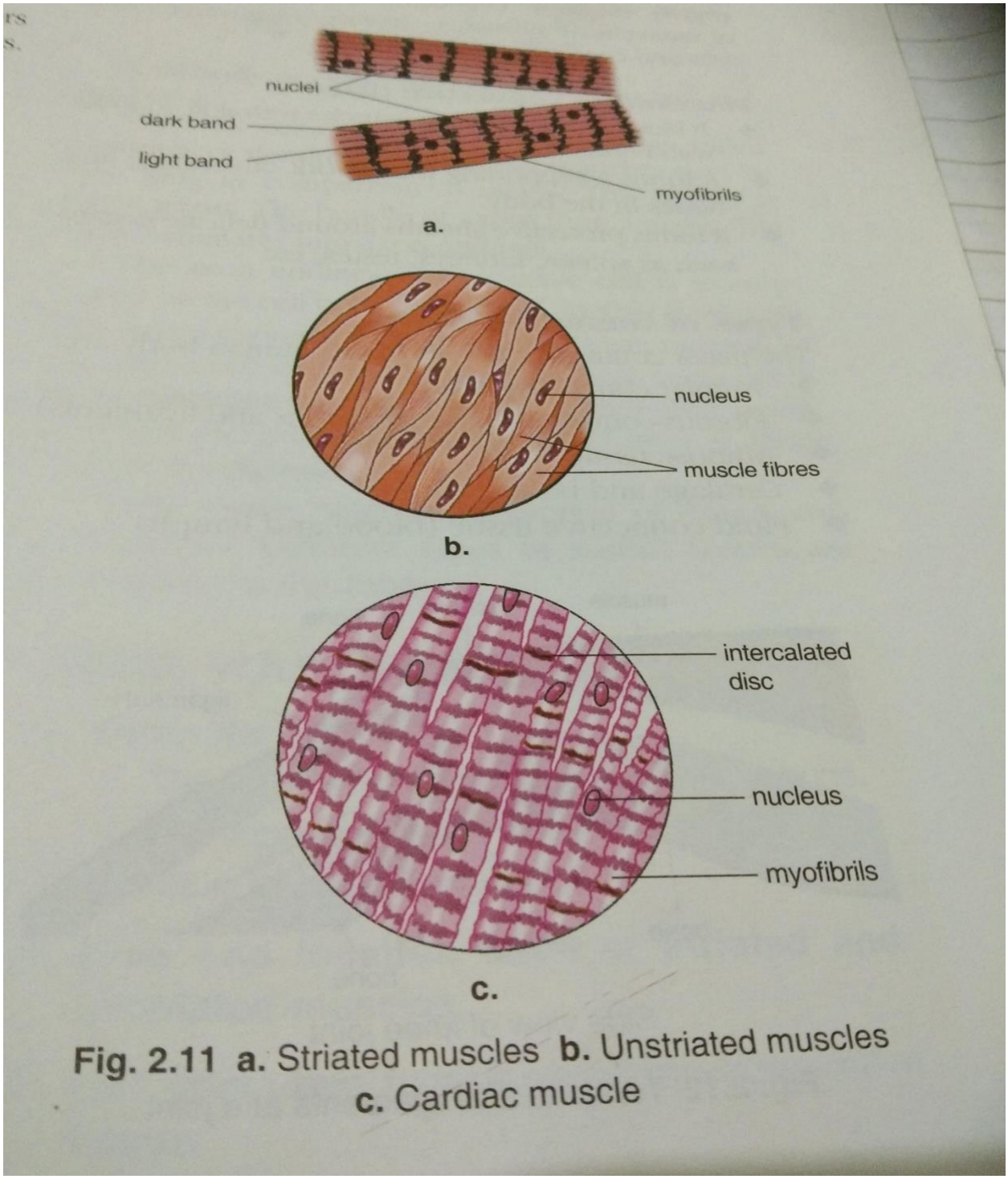

Fig. 2.11 **a.** Striated muscles **b.** Unstriated muscles **c.** Cardiac muscle

Home work

Solve exercise A,B and C in your book with pencil. Write down the answers of E in your copy.