INTERNATIONAL INDIAN SCHOOL BURAIDAH

TISSUES L#6

Question 1. What is a tissue?
Answer: A group of cells that are similar in structure and work together to do a peculiar function is called tissue.

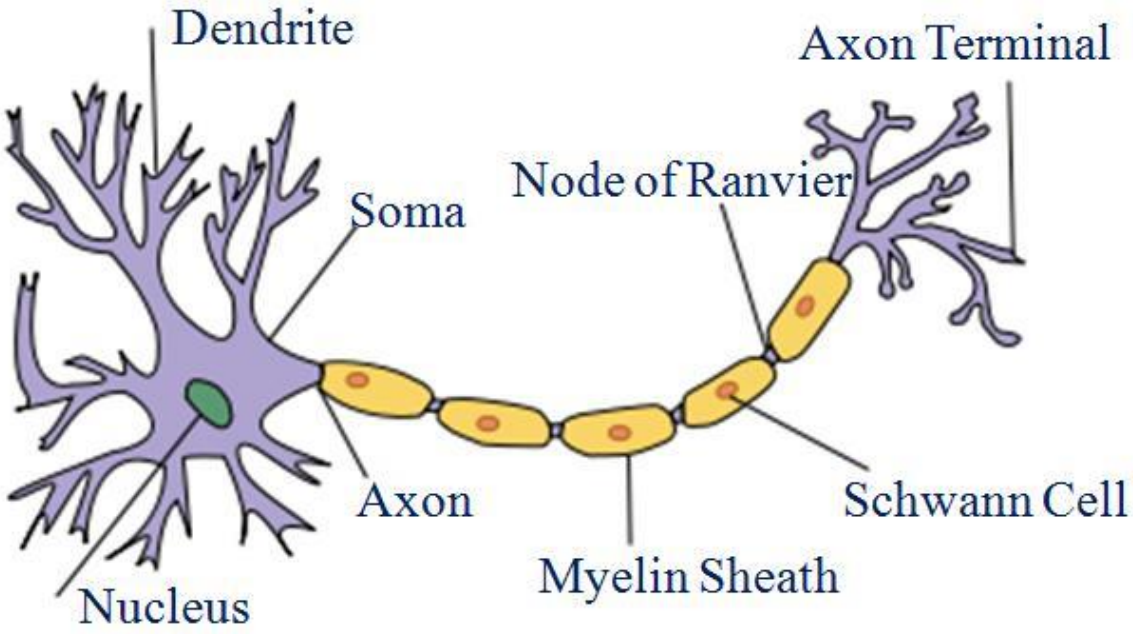
Question 2. What is the utility of tissues in multicellular organisms?
Answer: Tissues provide structural strength, mechanical strength, show division of labour. Tissues in multicellular organisms are differentiated to perform a specific function at a given location, a process known as division of labor. Nerve cells, for example, make up the neurological tissue that aids in message transmission, whereas muscular cells make up the muscle tissue and muscle tissue is a type of tissue that aids in movement.

Question 3. Which tissue makes up the husk of coconut?
Answer: The husk of coconut is made of sclerenchymatous tissue.

Question 4. What are the constituents of phloem?
Answer: Phloem is made up of four types of elements sieve tube, companion cells, phloem fibres and phloem parenchyma.

Question 5. Name the tissue responsible for movement in our body.
Answer: 1. Muscular tissue, 2. Nervous tissue, combination of both the tissues are responsible for movement in our body.

Question 6. What does a neuron look like?
Answer: A neuron consists of a cell body with a nucleus and cytoplasm, from which long thin hair like parts arise. Each neuron has a single long part called the axon, and many small, short branched parts called dendrite. An individual nerve cell is called neuron, it may be up to a metre long.



NEURON

Question 7. Give three features of cardiac muscles.
Answer: Feature of cardiac muscles
(1) Heart muscles (cardiac muscles) are cylindrical, branched and uninucleated
(2) They are striated muscle fibres.
(3) They are involuntary muscles, cannot be controlled by us.

Question 8. What are the Junctions of areolar tissue?
Answer: Areolar tissue are connective tissues found in animal. It is found between skin and muscles, around blood vessels and nerves and in the bone marrow.
It fills the space inside the organs, supports internal organs and helps in the repair of tissues.

Question 9. Define the term "tissue".
Answer: Group of cells that are similar in structure and perform same function is called a tissue.

Question 10. How many types of elements together make up the xylem tissue? Name them.
Answer: The xylem is made up of vessels, trachieds, xylem fibres and xylem parenchyma.

Question 11. How are simple tissues different from complex tissues in plants?
Answer: Simple tissues are made up of one type of cells which coordinate to perform a common function.
Complex tissues are made up of more than one type of cells. All these coordinate to perform a common function.

Question 12. Differentiate between parenchyma, collenchyma and sclerenchyma on the basis of their cell wall.
Answer: Parenchyma: The cells have thin cell walls made up of cellulose.
Collenchyma: The cells have cell walls thickened at the comers due to pectin deposition.
Sclerenchyma: Their walls are thickened due to lignin deposition.

Question 13. What are the functions of stomata?
Answer: The outermost layer of the cell is called epidermis and is very porous. These pores are called stomata. These stomata help in transpiration and exchange of gases.

Question 14. Diagrammatically show the difference between the three types of muscle fibres.
Answer: Striated muscles
(1) They are connected to bones (Skeletal muscles).
(2) They are voluntary muscles.
(3) The cells are long, cylindrical with many nucleus and are unbranched.
Smooth muscles
(1) They are found in alimentary canal and lungs.
(2) They are involuntary muscles.
(3) They are spindle in shape and have single nucleus.
Cardiac muscles
(1) They are found in heart.
(2) They are involuntary in action.
(3) They are branched and have one nucleus.

Question 15. What is the specific function of the cardiac muscle?
Answer: (1) Cardiac muscles cells are cylindrical, branched and uninucleated.
(2) They are involuntary muscles.
(3) They show rhythmically contraction and relaxation throughout life.
(4) Their rhythmic contraction and relaxation helps in pumping action of heart.

Question 16. Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and location in the body.
Answer:

Character	Striated Muscles	Unstriated Muscles	Cardiac Muscles
1. Shape	Cells are long, cylindrical, non-tapering and are unbranched.	Cells are long with tapering ends and are unbranched.	Cells are non-tapering and cylindrical in shape and are branched.
2. Location in body	In hands, legs and skeletal muscles.	The wall of stomach, intestine, ureter and bronchi, etc.	In the heart.
3. Light and dark bands	Present.	Absent.	Present but less prominent.

Question 17. Name the following:
(1) Tissue that forms the inner lining of our mouth.
(2) Tissue that connect muscle to bone in humans.
(3) Tissue that trar-carts food in plants.
(4) Tissue that siwea j'ut in our body.
(5) Connective tissue with a fluid matrix.
(6) Tissue present in the brain.
Answer: (1) Squamous epithelium (2) Tendons
(3) Phloem (4) Areolar tissue
(5) Blood (6) Nervous tissue

Question 18. Identify the type of tissue in the following: Skin, bark of tree, bone, lining of kidney tubule, vascular bundle.
Answer: (a) Skin—Striated squamous epithelium
(b) Bark of tree—Cork, protective tissue
(c) Bone—Connective tissue
(d) Lining of kidney tubule—Cuboidal epithelium tisse
(e) Vascular bundle—Conducting tissue

Question 19. Name the regions in which parenchyma tissue is present.
Answer: In the pith of the roots and stems. When it contains chlorophyll, it is called chlorenchyma, found in green leaves. In aquatic plants, parenchyma contains large air cavities and help them to float. Such type of parenchyma is called aerenchyma.

Question 20. What is the role of epidermis in plants?
Answer: Cells of epidermis forms a continuous layer without intercellular spaces. It protects all the parts of plants.

Question 21. How does the cork act as a protective tissue?
Answer: Cork acts as a protective tissue because its cells are dead and compactly arranged without intercellular spaces. They have deposition of suberin on the walls that make them impervious to gases and water.

22. What are the functions of areolar tissue?

Ans: Areolar tissues are commonly seen in animals. They are connective tissues that exist between the skin and the muscles. They can also be found in the bone marrow and around blood arteries and nerves. These tissues take up a lot of room inside the organs. They protect the internal organs and aid in tissue restoration in the event of harm.

23.How are simple tissues different from complex tissues in plants?

Ans:

Simple Tissues	Complex Tissues
Simple tissues consist of only one type of cell.	They are composed of various types of cells
The structures of all the cells are similar, and they perform similar duties.	The roles and structures of different types of cells vary.
Plants have three types of simple tissues: parenchyma, collenchyma, and sclerenchyma.	Xylem and phloem are two types of complex permanent tissues found in plants.

24. **Differentiate between parenchyma, collenchyma and sclerenchyma, on the basis of their cell wall.**

Ans:

Parenchyma	Collenchyma	Sclerenchyma
Thin cell walls, cells are loosely packed.	The cell wall is thickened irregularly at the corners, and there is very little space between the cells.	There are no intercellular spaces because the cell walls are evenly thickened.
The cell wall is made up of cellulose.	Pectin and hemicellulose are the two most important components of the cell wall.	There is an extra layer of the cell wall that is mostly made up of lignin.

25. What are the functions of the stomata?

Ans: Stomata functions include the exchange of gases with the atmosphere. The stomata are responsible for transpiration.

26.Diagrammatically show the difference between the three types of muscle fibres.

Ans: Striated muscles, smooth muscles (unstriated muscle fibre), and cardiac muscles are the three types of muscular fibres.

(Draw the diagrams of all the types of muscles)

27.Differentiate between striated, unstriated, and cardiac muscles on the basis of their structure and site/location in the body.

Ans: Differences between striated, unstriated and cardiac muscles are:

Striated Muscles	**Unstriated Muscles**	**Cardiac Muscles**
On The Basis of Structure:		
Cylindrical	Long	Cylindrical
Not branched	Not branched	Branched
Multinucleate	Uninucleate	Uninucleate
Its ends are blunt	Its ends are tapering	Its ends are flat and wavy
Colored alternate light and dark bands	There are no bands present	Faint bands are present
On The Basis of Location:		
These muscles are present in different body parts such as hands, legs, tongue, etc.	The contraction and relaxation of blood vessels, as well as the movement of food in the alimentary canal, are all controlled by these muscles.	These muscles control the heart's contraction and relaxation.

28.Name the following:

a. Tissue that forms the inner lining of our mouth.

Ans: Epithelial tissue

b. Tissue that connects muscle to bone in humans.

Ans: Dense regular connective tissue (tendons)

c. Tissue that transports food in plants.

Ans: Phloem

d. **Tissue that stores fat in our body.**

Ans: Adipose tissue

e. **Connective tissue with a fluid matrix.**

Ans: Blood

f. **Tissue present in the brain.**

Ans: Nervous tissue

29. Identify the type of tissue in the following: skin, the bark of a tree, bone, lining of kidney tubule, vascular bundle.

Ans:

- **Skin:** Stratified squamous epithelial tissue
- **The Bark of a Tree:** Simple permanent tissue
- **Bone:** Connective tissue
- **The Lining of Kidney Tubule:** Cuboidal epithelial tissue
- **Vascular Bundle:** Complex permanent tissue

30. Name the regions in which parenchyma tissue is present.

Ans: Leaves, fruits, and flowers.

31. What is the role of the epidermis in plants?

Ans: Role of the epidermis:

- Protection of different parts of the plant.
- Epidermal cells present in roots, help in the absorption of water.

- For protection against loss of water, mechanical injury, and parasitic fungus by producing a waxy, water-resistant covering called the cuticle, which is made of cutin, on the outer surface of the plant.

32. How does the cork act as a protective tissue?

Ans: The cork, which is made up of dead cells, is the bark of a tree. It protects the plant from mechanical damage and temperature extremes, as well as it prevents water loss through evaporation.

Question 1.
List any four salient features of meristematic tissue.
Answer:
The salient features of meristematic tissue are:

- This tissue consists of cells which continuously divide to produce new cells.
- The cells of this tissue lack vacuoles.
- The cells of this tissue have dense cytoplasm.
- The cells of this tissue have thin cellulosic cell walls and prominent nuclei.

Ques 33. Write the four elements of xylem.
Answer:
The four elements of xylem are tracheids, vessels, xylem parenchyma and xylem fibres.

Ques 34.How is ligament different from tendons?
Or
Differentiate between tendon and ligament.
Answer: Ligament is a connective tissue which joins bone to bone and is elastic in nature.

Tendons join bone to muscles and are less elastic as compared to the ligaments.

Ques35.
Write a short note on the different types of meristematic tissue with their location and functions in the plants.
Answer:
The meristematic tissues are classified as apical, lateral and intercalary meristematic tissue based on the region where they are present.

Apical meristem – It is present at the growing tips of stem and roots and results in increase in the length of the stem and the root. Lateral meristem (cambium): It is

present on the lateral sides of stem and roots. It helps to increase the girth of the stem or root.

Intercalary meristem – It is present at the base of the leaves or internodes. It helps in the longitudinal growth of plants.

35. Explain how the bark of a tree is formed. How does it act as a protective tissue?
Answer:
In the older stem, a strip of secondary meristem replaces the epidermis. The secondary meristem cuts off cells towards outside to form a several-layer thick tissue; This is called the cork or the bark of the tree.

Cells of cork or bark are dead, compactly arranged without intercellular spaces and have a chemical called suberin in their walls that makes them impervious to gases and water. In this way it acts as a protective tissue.

36. What are the two main components of blood? Why is blood considered a type of connective tissue?
Answer:
Blood is a special connective tissue consisting of a fluid matrix, plasma, and formed elements. The formed elements are red blood cells (RBCs), white blood cells (WBCs) and blood platelets. Blood is considered as a type of connective tissue as they have the same origin as other types of connective tissue and helps to connect the different parts of the body to facilitate exchange of various components like nutrients and gases.

37.Give one function of each of the following.
(i) Stomata
(ii) Root nodules
(iii) Cardiac muscle fibres
Answer:
(i) Stomata: Help in exchange of gases in the plants.

(ii) Root nodules: In leguminous plants, the root nodules harbour nitrogen fixing bacteria which convert atmospheric nitrogen into nitrates.

(iii) Cardiac muscle fibres: They help in rhythmic contraction and relaxation of the heart.

38.Why is epidermis important for the plants?
Answer:
The outermost layer of cells covering an organism is called epidermis. It is usually made up of a single layer of cells and gives protection.

The epidermis may be thicker in some plants living in dry habitats or often secrete a waxy, water- resistant layer on their outer surface called cutin (chemical substance with waterproof quality) to prevent water loss.

The stomata present on the epidermis of leaves helps in gaseous exchange and the loss of water vapour by transpiration.

The epidermal cells of roots bear root hairs that greatly increase the total absorptive surface area of the roots for absorption of water.

39. Differentiate between
(i) Xylem and phloem
(ii) Vessel and sieve tube
(iii) Tracheid and vessel
Answer:
(i) Xylem and phloem –
Xylem:

- Xylem consists of tracheids, vessels, xylem parenchyma and xylem fibres.
- All the cells of xylem except the xylem parenchyma are dead.
- Xylem helps to transport water and minerals.
- The transport is unidirectional through xylem.

Phloem:

- Phloem has four elements called sieve tubes, companion cells, phloem fibres and the phloem parenchyma.
- All cells of phloem are living except the phloem fibres.

- 40. Phloem transports food from leaves to other parts of the plant.
- The transport is bidirectional through the phloem.

(ii) Vessel and sieve tube –
Vessel:

- They are tubular structures having a hollow lumen and composed of dead cells.
- Vessel helps to conduct water and minerals in plants.
- The walls of vessels are lignified.
- They also provide mechanical strength to the plants.
- Their end walls are completely dissolved.

Sieve Tube:

- They are tubular structures having vacuolated cytoplasm and composed of living cells.
- They help to transport food from leaves to other parts of the plant.
- Their walls are not lignified.
- They do not provide mechanical strength to the plants.
- Their end walls have perforations in form of sieve plate.

(iii) Tracheid and vessel

Tracheids:

- Tracheids are elongated or tube-like cells with thick and lignified walls and tapering ends.
- They are in the form of single cells.
- The inner layers of the cell walls are more thickened.
- They have narrow lumen.
- They have pointed ends.

Vessel:

- Vessel is a long cylindrical tube-like structure made up of many cells called vessel members.
- They are composed of a number of cells fused together.
- Their walls are less thickened.
- They have wide lumen.
- They have blunt ends.

Q. What is nervous tissue?

ANS. Nervous tissue is a tissue made of neurons. It is divided into two parts: the central nervous system (CNS) consisting of the brain and spinal cord; and the peripheral nervous system (PNS) which regulates and controls the various functions and activities of the body.

Q. List the characteristics of cork. How are they formed? Mention their role.
Ans. The characteristics of cork are:

- Cells of cork are dead at maturity.
- These cells are compactly arranged.
- Cells do not possess intercellular spaces.
- Cells possess a chemical substance suberin in their walls.
- They are several layers thick.

A strip of secondary meristem replaces the epidermis of the older stem and cuts off the outside cells to form a several-layer thick cork or the bark of the tree. Cells of cork are dead, compactly arranged without intercellular spaces and have a chemical called

suberin in their walls that makes them protective in function and impervious to gases and water.

Ques.
(a) Differentiate between meristematic and permanent tissues in plants.
(b) Define the process of differentiation.
(c) Name any two simple and two complex permanent tissues in plants.
Answer:
(a) Meristematic tissue:

- This tissue consists of cells which continuously divide to produce new cells.
- They are located at specific regions of the plant, i.e., apical, lateral and intercalary.
- The cells of this tissue are very active, lack vacuoles, have dense cytoplasm, thin cell walls and prominent nuclei.

Permanent tissue:

- Consists of cells which have taken up a specific role and lost the ability to divide.
- They are distributed throughout the plant body.
- They are vacuolated, vary in shape and size. Their cell wall may be thick.

(b) The process of taking up a permanent shape, size, and a function by the cells is called differentiation.

(c) Simple: Parenchyma/collenchyma/sclerenchyma Complex: Phloem/xylem

Ques. The walls of the sclerenchymatous cells are thickened and have narrow lumen. Which substance thickens it and what is its role?
Answer: The walls of the sclerenchymatous cells are thickened due to presence of lignin. It helps in providing mechanical strength to the various parts of the plant.

Ques. Which type of muscle fibres will contract to remove your hands instantly when you touch a hot object?
Answer: Striated muscle fibres will contract to remove our hands instantly when we touch a hot object.

Ques. Which tissue helps the leaves of lotus plant to float on water? Why?
Answer: Aerenchyma helps the leaves of lotus plant to float on water. Aerenchyma has large cavities to provide buoyancy to the parts of aquatic plants.

Ques A tissue present in plants helps in storing food and sideways conduction of water. Identify the type of tissue.
Answer: The tissue is xylem parenchyma.

Ques. Which tissue enables the heart to pump blood to various parts of the body? Why?
Answer:The cardiac muscles help the heart to pump blood to various parts of the body as they show rhythmic contraction and relaxation throughout their life.

QuesWhat will be the consequence of
(i) removal of blood platelets from blood?
(ii) removal of cutin from the layer of epidermis?
Answer: (i) Removal of blood platelets from blood will inhibit clotting of blood if an injury occurs and the person may bleed to death.
(ii) Removal of cutin would increase the amount of water loss from the leaves of the plants.

Ques.Some actions of our body are under our control but many of them are not under our control. Why is it so?
Answer: The actions of our body are controlled by our muscles. The voluntary actions are under the control of our will and are caused by the activity of striated muscles, eg., movement of our limbs. The involuntary . actions are not under the control of our will and are performed by the smooth muscles, e.g., the activity of bronchi of lungs. Even the activity of cardiac muscles which helps in the rhythmic contraction and relaxation of heart are involuntary in nature.

Ques.Which kind of meristem can help grasses to regenerate parts removed by the grazing herbivores?
Answer: Intercalary meristem can help grasses to regenerate parts removed by the grazing herbivores.

Ques Name the tissue which replaces the epidermal tissue in older stem and is rich in suberin. What is the function of suberin?
Ans. Cork is the tissue which replaces the epidermal tissue in older stem and is rich in suberin. Suberin present in the walls of cork cells makes them impervious to gases and water.

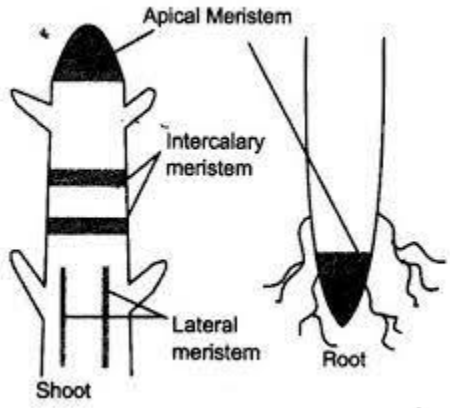
Ques. The process of transpiration does not occur properly when the leaves are covered by a layer of oily substance. Why? Which other functions will get affected due to this covering?
Ans: The layer of oily substance will close the stomata present in leaves and this would decrease the rate of transpiration. The rate of exchange of gases decreases and consequently the rate of photosynthesis would also decrease.

Ques. Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and site/location in the body.

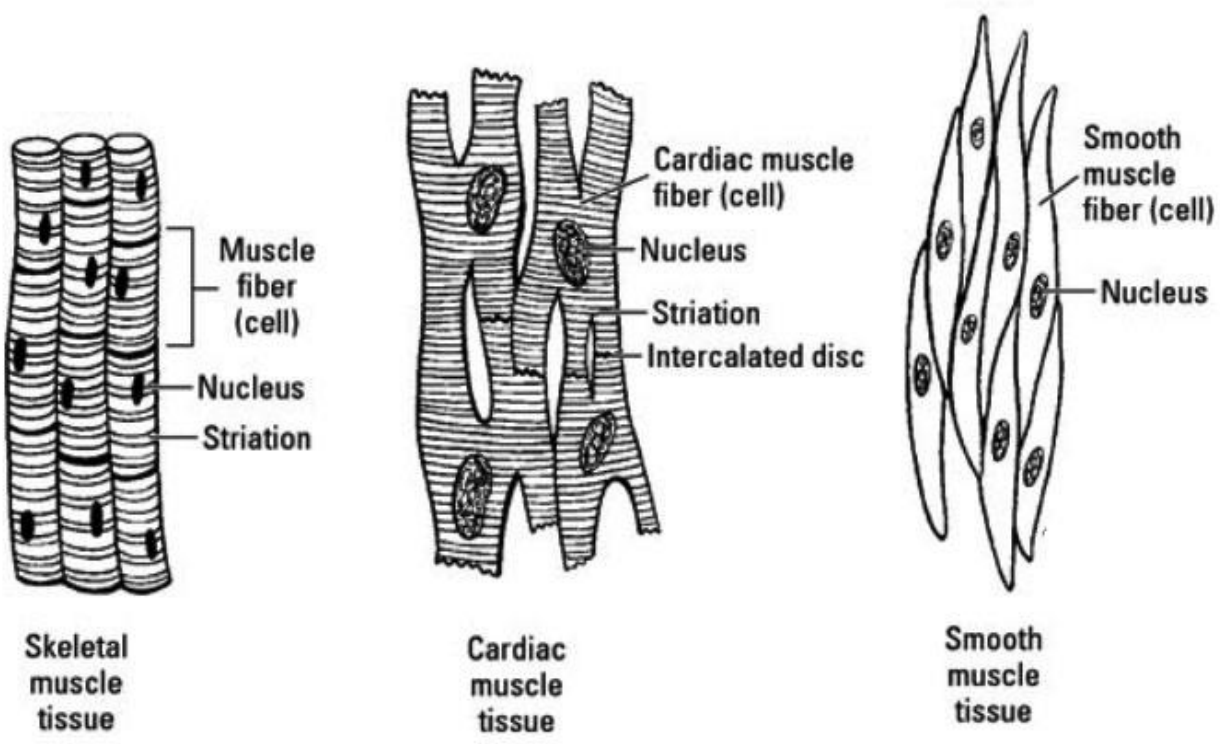
Answer:

Striated Muscle	Unstriated Muscle	Cardiac Muscle
These are voluntary muscles.	These are involuntary muscles.	These are involuntary muscles.
The cells are long, cylindrical.	The cells are long with pointed ends.	The cells are cylindrical.
Cells are unbranched	Cells are unbranched	Cells are branched
Cells are multinucleate.	Cells are uninucleate.	Cells are uninucleate
These muscles are present in limbs and join the bones.	These muscles are found in the alimentary canal, bronchi of the lungs, etc.	These muscles are only found in the wall of the heart.

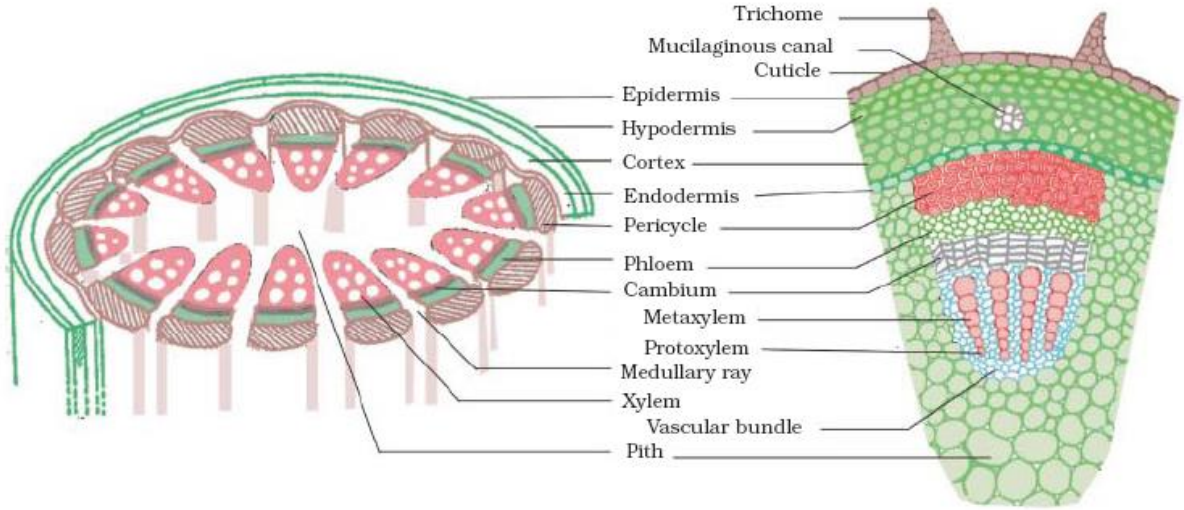
Diagrams:



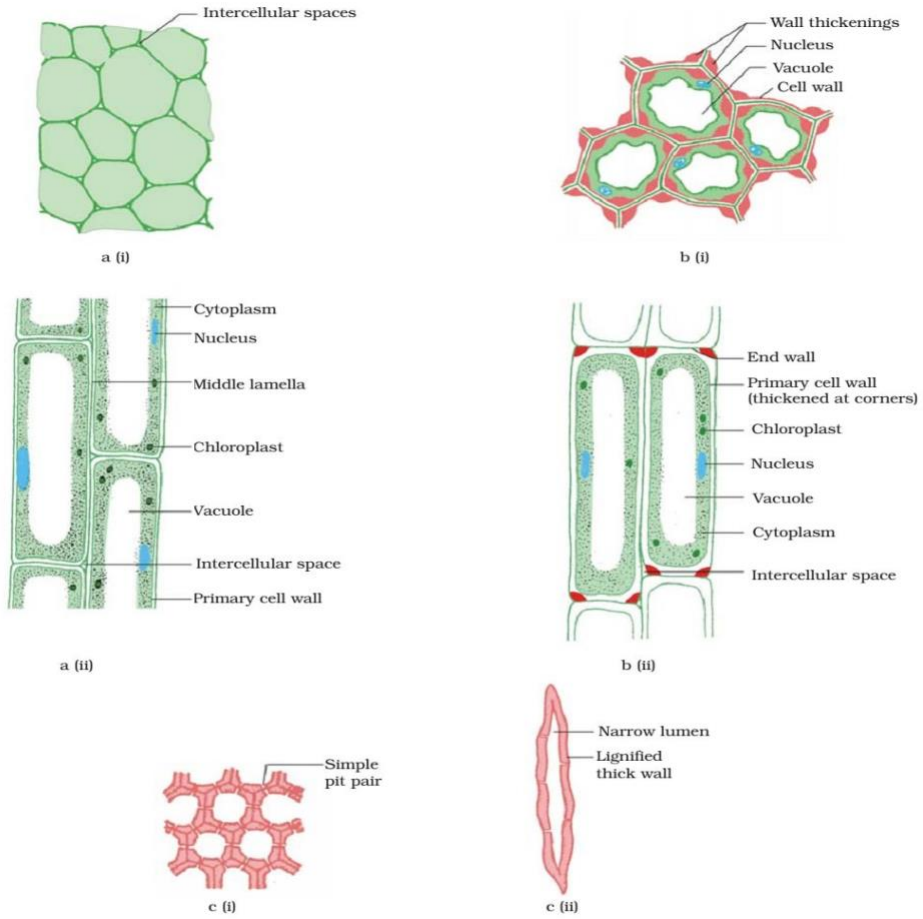
Location and types of Meristematic tissues



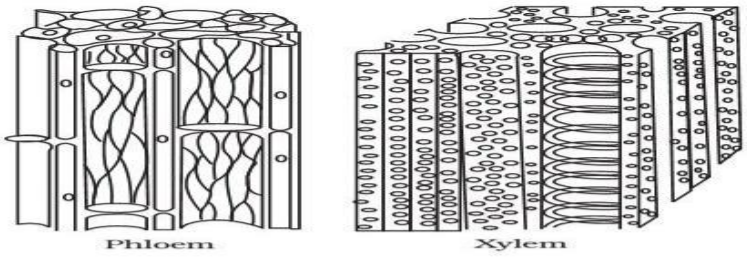
Types of muscular tissues

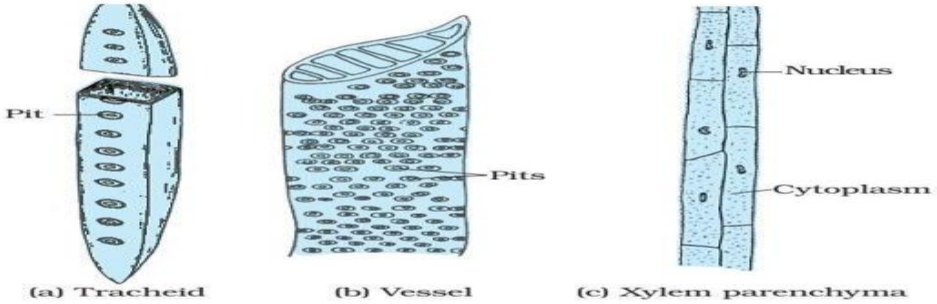


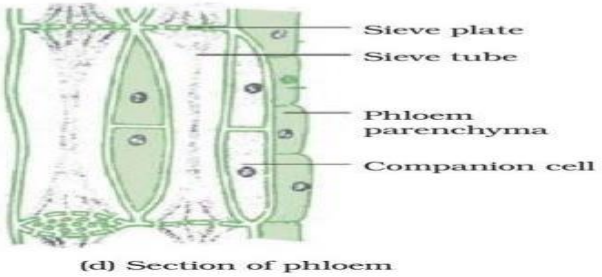
Section of a stem

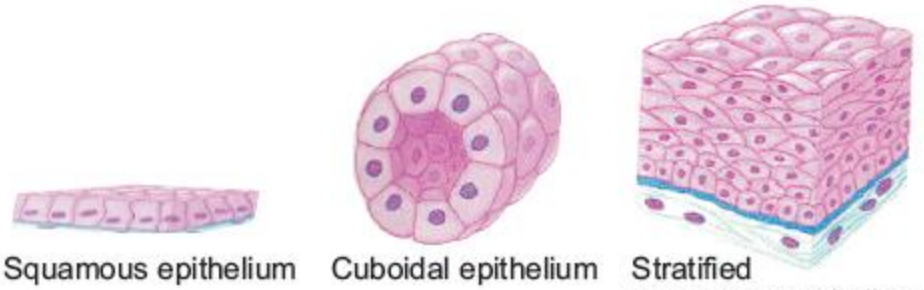


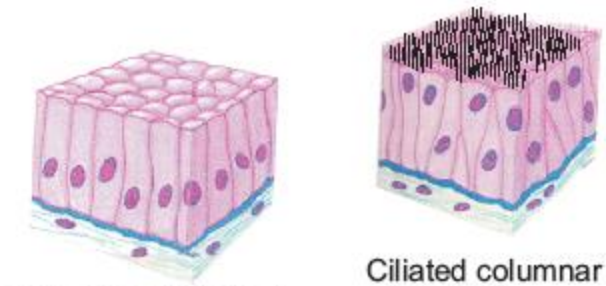
. 6.4: *Various types of simple tissues: (a) Parenchyma (i) transverse section, (ii) longitudinal section; (b) Collenchyma (i) transverse section, (ii) longitudinal section; (c) Sclerenchyma (i) transverse section, (ii) longitudinal section.*


Phloem
Xylem


Pit
Pits
Nucleus
Cytoplasm
(a) Tracheid
(b) Vessel
(c) Xylem parenchyma


Sieve plate
Sieve tube
Phloem parenchyma
Companion cell
(d) Section of phloem


Squamous epithelium
Cuboidal epithelium
Stratified squamous epithelium


Columnar epithelium
Ciliated columnar epithelium