

Chapter 6 Tissues

1. What is a tissue?

Solution:

A tissue is defined as a cluster of cells which are similar in structure and work together to perform a particular function.

2. What is the utility of tissues in multicellular organisms?

Solution:

The use of tissues in multicellular organisms is to provide structural and mechanical strength as well as to allow division of labour.

2. How many types of elements together make up the xylem tissue? Name them.

Solution:

The xylem tissue is made up of four main elements, namely:

- Vessels
- Tracheids
- Xylem fibres
- Xylem parenchyma

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

Solution:

The following are the differences:

Simple tissues	Complex tissues
They are made up of a single type of cell that performs only one common function	They are made up of more than one kind of a cell that coordinate to perform one particular function

Question 3:

How are simple tissues different from complex tissues in plants?

ANSWER:

Simple tissue	Complex tissue
These tissues consist of only one type of cells.	These tissues are made up of more than one type of cells.
The cells are more or less similar in structure and perform similar functions.	Different types of cells perform different functions. For example, in the xylem tissue, tracheids help in water transport, whereas parenchyma stores food.
Three types of simple tissues in plants are parenchyma, collenchyma, and sclerenchyma.	Two types of complex permanent tissues in plants are xylem and phloem.

Question 4:

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

ANSWER:

Parenchyma	Collenchyma	Sclerenchym
Cell walls are relatively thin, and the cells in parenchyma tissues are loosely packed.	The cell wall is irregularly thickened at the corners, and there is very little space between the cells.	The cell walls are uniformly thickened, and there are no intercellular spaces.
The cell wall in this tissue is made up of cellulose.	Pectin and hemicellulose are the major constituents of the cell wall.	An additional layer of the cell wall composed mainly of lignin is found.

5. What are the functions of the stomata?

Solution:

Stomata are the tiny pores present on the outer layer of the cells, the epidermis. Stomata bring about the exchange of gases and transpiration.

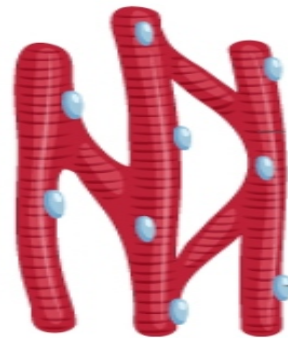
6. Diagrammatically show the difference between the three types of muscle fibres.

Solution:

There are three types of muscle fibres, they are:

1. Cardiac muscles

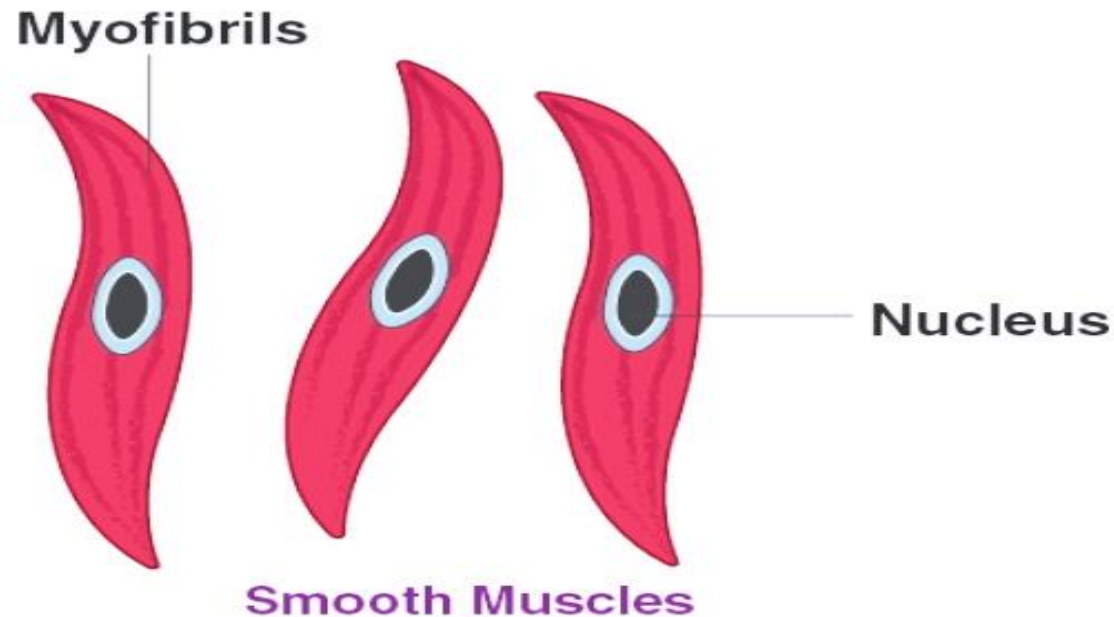
- Present in the heart.
- Involuntary in nature.
- They have 1 nucleus.
- The muscle fibers are branched.



Cardiac Muscles

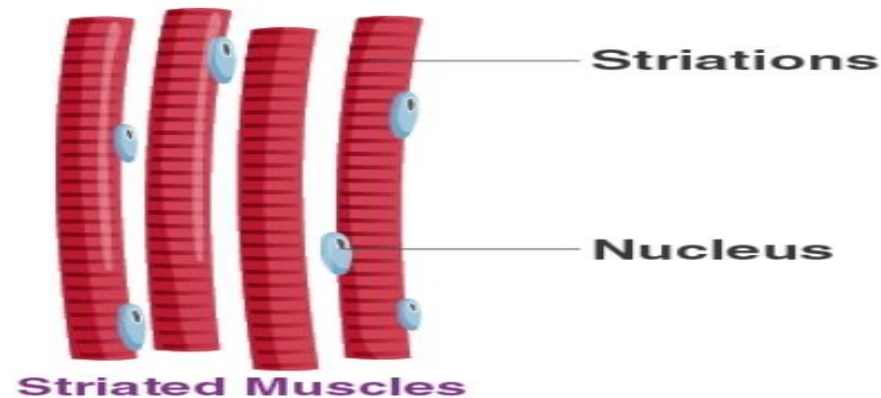
2. Smooth muscles

- Found in lungs and alimentary canal.
- Involuntary in nature.
- They have 1 nucleus.
- They are spindle shaped.



3. Striated muscles

- They are connected with bones
- Voluntary in nature.
- They are long and cylindrical muscle fibers.
- They possess many nuclei.
- Striated muscles are unbranched.



7. What is the specific function of the cardiac muscle?

Solution:

The cardiac muscles are branched and cylindrical. They are uninucleated and are involuntary in nature. Throughout one's lifetime, the cardiac muscles bring about the rhythmic contraction and relaxation.

10. Name the following.

- (a) Tissue that forms the inner lining of our mouth.**
- (b) Tissue that connects muscle to bone in humans.**
- (c) Tissue that transports food in plants.**
- (d) Tissue that stores fat in our body.**
- (e) Connective tissue with a fluid matrix.**
- (f) Tissue present in the brain.**

Solution:

- (a) Tissue that forms the inner lining of our mouth – The epithelial tissue, Squamous epithelium.
- (b) Tissue that connects muscle to bone in humans – Tendon
- (c) Tissue that transports food in plants – Phloem
- (d) Tissue that stores fat in our body – Adipose tissue
- (e) Connective tissue with a fluid matrix – Blood, it is a fluid connective tissue
- (f) Tissue present in the brain – Nervous tissue

11. Identify the type of tissue in the following:

Skin, bark of tree, bone, lining of kidney tubule, vascular bundle.

Solution:

- Skin: Striated squamous epithelial tissue
- Bark of tree: Protective tissue and cork
- Bone: Connective tissue
- Lining of kidney tubule: Cuboidal epithelial tissue
- Vascular bundle: Conducting tissue(xylem and phloem). Complex permanent tissue

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

Solution:

The parenchyma is found in:

- The pith of stems and roots
- When parenchyma contains chlorophyll it is called as chlorenchyma, it is found in green leaves
- Parenchyma found in aquatic plants has large air cavities which enables them to float and are hence called aerenchyma.

13. What is the role of epidermis in plants?

Solution:

The epidermis in plants forms an uninterrupted and continuous layer that has no intercellular spaces. It provides protection.

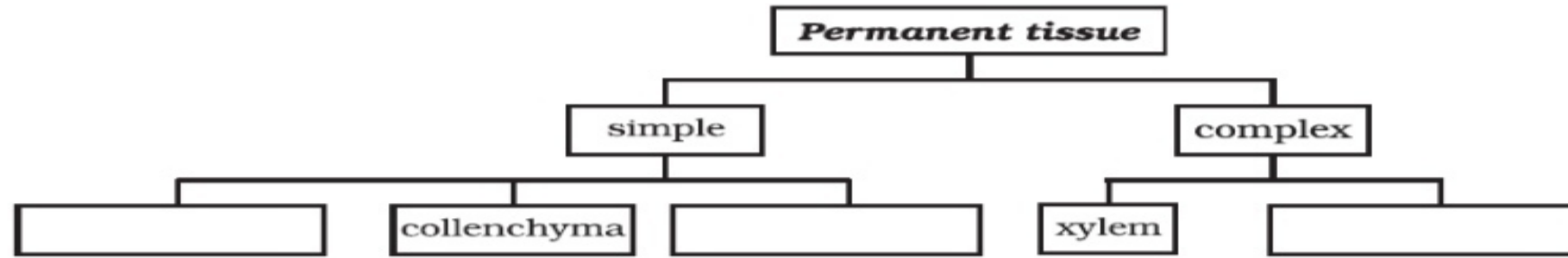
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14. How does the cork act as a protective tissue?

Solution:

Cork cells are dead. The arrangement of cells is so dense, that there is no intercellular space. Deposition of suberin is observed on the walls of the cells that make them impervious to water and gases.

15. Complete the following chart.



Solution:

The completed chart is as follows:

