

Assignments in Science Class IX (Term I)

6

Tissues

IMPORTANT NOTES

1. Multicellular organisms consist of many groups of specialised cells making up their tissues and organs.
2. **Differentiation** is the process by which unspecialised structures become modified and specialised for performing specific functions.
3. Differentiation results in **division of labour**.
4. The study of the structure of tissues and organs is known as **histology**.
5. Based on ability to divide, plant tissues may be classified as **meristematic tissue** and **permanent tissue**.
6. Meristematic tissues are responsible for **growth** in plants.
7. The part of the plant body where meristematic tissues are present is called **meristem**.
8. Meristematic cells possess the power of cell division.
9. Permanent tissues are those which have lost the capacity to divide.
10. Based on function, permanent tissues are classified as **protective tissues, supporting tissues, conducting tissues** and **secretory tissues**.
11. **Parenchyma** is a widely distributed, simple plant tissue.
12. **Collenchyma** is a strong and flexible mechanical tissue.
13. Like collenchyma, sclerenchyma is also a strengthening and protective tissue.
14. **Xylem** and **phloem** are the conducting tissues or vascular tissues, also called complex tissues.
15. Xylem is popularly known as **wood**.
16. Xylem is composed of tracheids, vessels, xylem parenchyma and xylem fibres.
17. In higher plants, xylem and phloem usually occur together forming **vascular bundle**.
18. Phloem is composed of sieve tubes, companion cells, phloem parenchyma and phloem fibres.
19. Protective tissues include **epidermis** and **cork**.
20. In old roots and stem, the epidermal tissue at the periphery is replaced by cork.
21. Four basic types of animal tissues are — **epithelium** or **epithelial tissue, connective tissue, muscular tissue** and **nervous tissue**.
22. The epithelial cells lie close together with little or no **intercellular substances**.
23. The main function of epithelium is to give protection to the underlying tissues.
24. **Connective tissue** serves to 'connect' or 'bind' the cells of other tissues in the body and gives them rigidity and support.
25. Areolar connective tissue is of two types – white fibres (made of collagen) and yellow fibres (made of elastin).
26. **Tendon** is made up of white fibres and connects muscles to bones.
27. **Ligaments** consist of yellow fibres and connect one bone to another bone.
28. **Cartilage** is a non-porous connective tissue.
29. **Bone** is very strong, rigid and porous tissue.
30. Bone is surrounded by a connective tissue known as **periosteum**.
31. Bones make up approximately 15% of body mass of an adult.
32. **Blood** is a bright, red-coloured fluid connective tissue consisting of plasma and blood cells (erythrocytes, leucocytes and platelets).
33. **Lymph** is another fluid connective tissue consisting of plasma and mainly white blood cells.
34. **Muscular tissue** is a **contractile tissue** which possesses myofibrils, sarcoplasm, sarcolemma, etc.
35. The main function of muscular tissue is to bring about movement of body parts and locomotion of individual.
36. Muscular tissue is of three types – **striated** or **voluntary, smooth** or **involuntary** and **cardiac** muscles.
37. **Nervous tissue** is a very specialised tissue for receiving stimuli or sensations and transmitting messages.
38. **Nerve cells** or **neurons** form the most important elements of nervous tissue.
39. The three main parts of a neuron are **cell body** or **cyton, dendron** and the **axon**.

ASSIGNMENTS FOR SUMMATIVE ASSESSMENT

I. VERY SHORT ANSWER QUESTIONS

(1 Mark)

OTHER IMPORTANT QUESTIONS

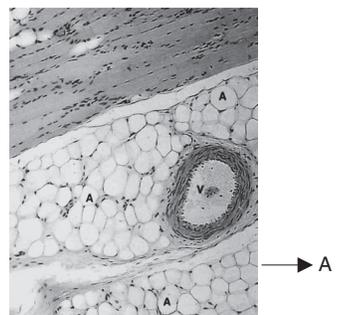
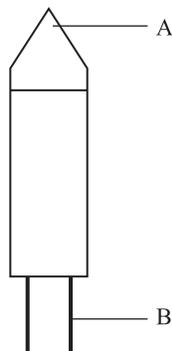
1. Name the tissue which is present at the growing tips of stem and roots.
2. What do you mean by aerenchyma?
3. Name the tissue which allows easy bending in various parts of a plant.
4. Which structure protects the plant body against the invasion of parasites?
5. Where is intercalary meristem found?
6. Name the tissue that stores fat in our body.
7. Based on ability to divide, how many types of plant tissues are found?
8. Name the tissue which forms the lining of kidney tubules and ducts of salivary glands.
9. Name the fibrous tissue with great strength but limited flexibility.
10. Name the tissues which makes up the husk of coconut.
11. What do you mean by glandular epithelium?
12. Where is cuboidal epithelium found?
13. Which tissue is responsible for movement in our body?
14. Where is involuntary muscles found in our body?
15. Name the tissue by which two bones can be connected with each other.
16. Name the tissue found in the iris of our eye.
17. Name the enucleate thin walled plant cells with perforated end walls.
18. Name the tissue present at the growing tips of root and stem.
19. What is the function of xylem?
20. What is the function of connective tissue?

II. SHORT ANSWER QUESTIONS – I

(2 Marks)

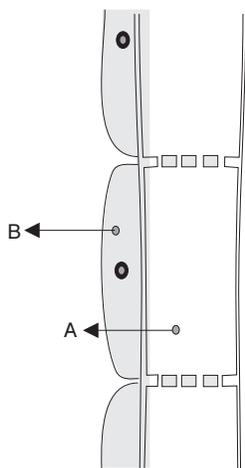
PREVIOUS YEARS' QUESTIONS

1. List two characteristics of cork cells which help them to function as protective tissue?
[2010 (T-I)]
2. Why does the growth of a plant occur in specific regions? Where are the following found?
(a) Intercalary Meristem
(b) Lateral Meristem
[2010 (T-I)]
3. Name the connective tissue which helps in repair of tissues. State where this tissue is found.
[2010 (T-I)]
4. (a) In the diagram of location of meristematic tissue in plant body given below, identify the type of meristematic tissue found in the regions marked 'A' and 'B' of a stem.
(b) State one function of each. [2010 (T-I)]
5. (a) Identify the region of the stem marked 'A' in the diagram given below and the type of simple permanent tissue found in this region. [2010 (T-I)]
(b) Mention any two characteristic features of the cells found in this tissue. [2010 (T-I)]



6. List any four salient features of meristematic tissue. [2010 (T-I)]
7. Which elements of xylem :
(i) help in transport of water and minerals,
(ii) store food and
(iii) provide mechanical support? [2010 (T-I)]
8. How does cork act as a protective tissue? [2010 (T-I)]

9. Draw diagram of a neuron showing nucleus and cell body. [2010 (T-I)]
10. In a temporary mount of a leaf epidermis we observe small pores.
 (a) What are the pores present in leaf epidermis called?
 (b) How are these pores beneficial to the plant? [2010 (T-I)]
11. Differentiate between aerenchyma and chlorenchyma. [2010 (T-I)]
12. Name the tissue that smoothens bone surfaces at joints. Describe its structure with the help of a diagram. [2010 (T-I)]
13. (a) Identify the type of plant tissue given below. Where in the stem of a plant would you find this tissue?
 (b) Label the parts marked 'A' and 'B'. [2010 (T-I)]



14. What is epidermis? What is its role? [2010 (T-I)]
15. (a) Draw a labelled diagram of a neuron.
 (b) Give two differences between tendon and ligament. [2010 (T-I)]
16. (a) State two important functions of areolar tissue.
 (b) Why are skeletal muscles known as striated muscles? [2010 (T-I)]
17. Write any two points of difference between structure and location of striated and unstriated muscles. [2010 (T-I)]
18. Give two points of difference between striated and cardiac muscle with respect to structure and location. [2010 (T-I)]
19. What is the role of epidermis in plants? [2010 (T-I)]
20. Blood is considered to be a connective tissue. Give reason. [2010 (T-I)]
21. Mention two functions of stomata. [2010 (T-I)]
22. What is ligament? Which type of tissue ligament is? [2010 (T-I)]
23. Give the other name of dividing tissue in plants. In which part of plants, apical meristem is present. Also mention its function. [2010 (T-I)]
24. Name the simple permanent tissue which :
 (a) forms the basic packing tissue
 (b) provide flexibility in plants [2010 (T-I)]

OTHER IMPORTANT QUESTIONS

1. How does fluid connective tissue differ from other connective tissues?
2. Mention the type of tissues present in the following parts :
 (a) Wall of ducts (b) Bridge of nose
3. How many types of elements are present in phloem?
4. In which part of the plant the following tissues are located?
 (a) Parenchyma (b) Sclerenchyma
5. List two structural characteristics of connective tissue.
6. How many types of tissues are found in animals?
7. Give two differences between striated and unstriated muscles.
8. Water hyacinth floats on water surface. Explain.
9. Why is epidermis important for plant?
10. Differentiate between columnar epithelium and cuboidal epithelium.

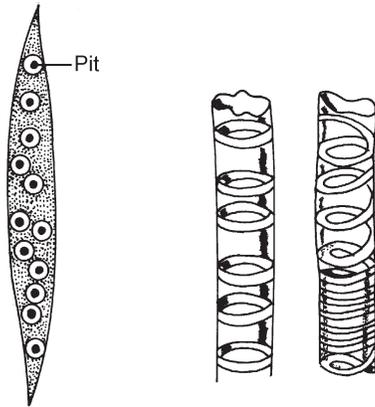
III. SHORT ANSWER QUESTIONS – II

(3 Marks)

PREVIOUS YEARS' QUESTIONS

1. Name the tissue responsible for flexibility in plants? How would you differentiate it from other permanent tissues? [2010 (T-I)]
2. What is a connective tissue? State its any two basic components. Differentiate between ligament and tendon. [2010 (T-I)]

3. (a) Identify the given figures.
 (b) State in brief their structure.
 (c) Describe the role performed by the two.
[2010 (T-I)]



4. (a) Draw labelled diagram of striated muscles.
 (b) Mention any two characteristic features of the cells that form the above muscular tissue.
[2010 (T-I)]

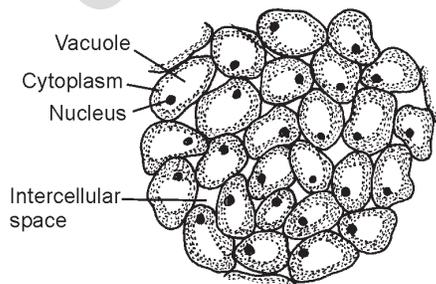
5. (a) Draw the adipose connective tissue.
 (b) Mention one region in the body where this tissue is present and state one function of this tissue.
[2010 (T-I)]

6. Draw diagrams to show the difference between the structures of the three types of muscle fibres.
[2010 (T-I)]

7. List any six characteristics of parenchyma tissue.
[2010 (T-I)]

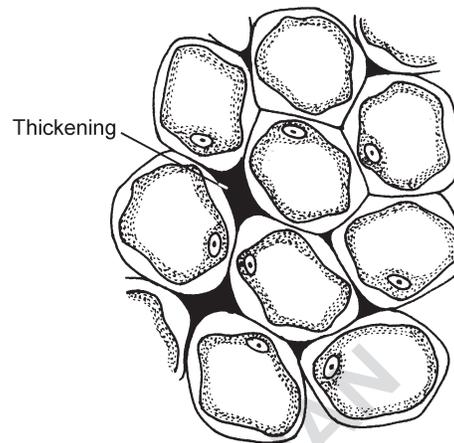
8. Draw labelled diagrams to show the difference between the structures of any two types of muscle fibres.
[2010 (T-I)]

9. (a) Identify the tissue.
 (b) Infer the characteristic features of these cells
 (c) Specify the function of the tissue
 (d) Name any one part of the plant where these cells are present
[2010 (T-I)]

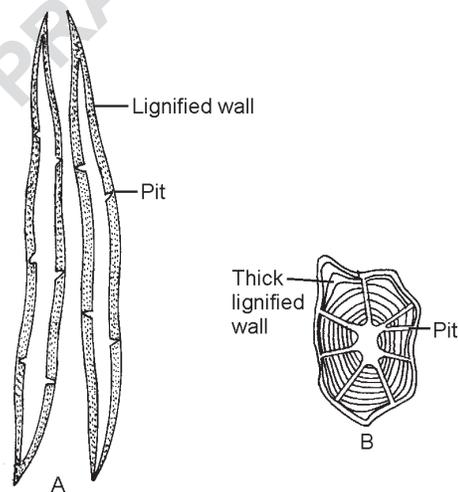


10. (a) Identify this tissue.
 (b) Infer the characteristic features of these cells.

- (c) Suggest any two parts of the plant where such cells are present.
[2010 (T-I)]



11. (a) Identify the tissue.
 (b) Infer the characteristic features of these cells.
 (c) Specify any two parts of the plant where such cells are present.
[2010 (T-I)]



12. How is meristematic tissue classified on the basis of its location? Draw a well labelled diagram to show the location of meristematic tissue in a plant body.
[2010 (T-I)]

13. (a) Draw a labelled diagram of a neuron. (Three labellings)

- (b) Identify the tissue which is made up of these cells.

- (c) Name one organ that is made of this tissue.
[2010 (T-I)]

14. Make a table to show the difference between striated, unstriated and cardiac muscles on the basis of their structure and location in the body.
[2010 (T-I)]

15. What do you understand by complex tissue? Name the two types of complex permanent tissue present

- in plants? Give one function of each complex tissue. [2010 (T-I)]
16. Name the fat storing tissue in our body. Describe its structure and function with the help of a diagram. [2010 (T-I)]
17. Draw a labelled diagram of a neuron and label any four parts. [2010 (T-I)]
18. Mention one function of each of the following :
- (i) Meristematic tissue (ii) Areolar tissue
(iii) Cork [2010 (T-I)]
19. Identify the type of tissue in the following : Skin, bark of tree, bone. [2010 (T-I)]
20. Identify the type of tissue in the following : Lining of kidney tubules, vascular bundle, skin. [2010 (T-I)]
21. Draw a well labelled diagram of phloem tissue. [2010 (T-I)]
22. Give two examples of complex tissues. Mention the function of each. [2010 (T-I)]
23. Draw a neuron-unit of nervous tissue and label axon, nucleus, dendrite, nerve ending. [2010 (T-I)]
24. Which permanent tissue :
- (a) forms husk of coconut.
(b) stores nutrients and water in stems and root.
(c) is irregularly thickened at corners. [2010 (T-I)]
25. (a) Name the following structures of a neuron :
Single long part which arises from cell body
part of neuron which bears many short, branched parts.
(b) What is nerve?
(c) Name two involuntary muscles. [2010 (T-I)]

OTHER IMPORTANT QUESTIONS

1. Animals of colder regions and fish of cold water have thicker layer of subcutaneous fat. Why?
2. Name the different components of xylem and draw a living component.
3. Differentiate between voluntary and involuntary muscles. Give one example for each type.
4. Where are companion cells located in plants? Mention their functions.
5. List the characteristics of cork. How are they formed? Mention their role.
6. Fill in the blanks
- (a) Lining of blood vessels is made up of _____ .
- (b) Lining of small intestine is made up of _____ .
- (c) Lining of kidney tubules is made up of _____ .
7. Differentiate the following activities on the basis of voluntary or involuntary muscles.
- (a) Jumping of frog (b) Pumping of the heart
(c) Passing of food in your intestine.
8. Draw and identify different elements of phloem.

IV. LONG ANSWER QUESTIONS

(5 Marks)

PREVIOUS YEARS' QUESTIONS

1. Describe the structure and function of different types of epithelial tissues.
Draw diagram of each type of epithelial tissue.
2. Draw well labelled diagrams of various types of muscles found in human body.
3. Give reasons for
- (a) Meristematic cells have a prominent nucleus and dense cytoplasm but they lack vacuole.
(b) Intercellular spaces are absent in sclerenchymatous tissues.
- (c) We get a crunchy and granular feeling, when we chew pear fruit.
(d) Branches of a tree move and bend freely in high wind velocity.
(e) It is difficult to pull out the husk of a coconut tree.
4. Why are xylem and phloem called complex tissues? How are they different from one other?
5. (a) Differentiate between meristematic and permanent tissues in plants.

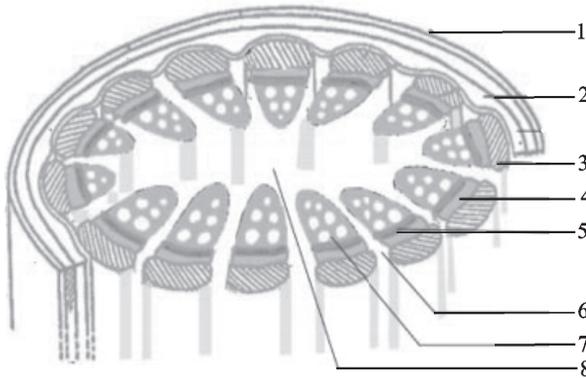
- (b) Define the process of differentiation.
 - (c) Name any two simple and two complex permanent tissues in plants.
6. Where are the following types of tissues located in an organism?

- (a) Ciliated epithelium
- (b) Columnar epithelium
- (c) Cuboidal epithelium
- (d) Sensory epithelium
- (e) Adipose connective tissue

ASSIGNMENTS FOR FORMATIVE ASSESSMENT

A. Group Activities

1. Observe the given diagram of 'Section of Stem' and name its different parts :



2. To learn about the tissues (meristematic tissues) responsible for growth in plants.

Materials Required

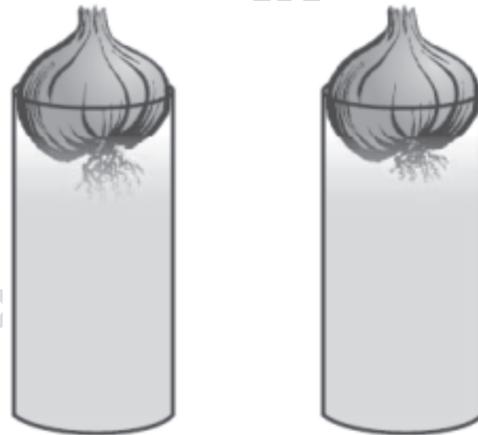
Two glass jars filled with water, two onion bulbs, scissors, ruler.

Procedure :

- (i) Take two glass jars filled with water.
- (ii) Take two onion bulbs and place one on each jar in such a manner that the base of the bulb is dipped in water.
- (iii) Observe on a daily basis what happens to the bulbs in the two jars. You will observe the roots coming out of the bulbs. Now measure the length of roots on day 1 and 2. On 3rd day, cut the tips of the roots of onion bulb in jar A and leave jar B as such. Observe the growth of roots in both the jars for a few more days. Record your

observation in the table given below :

From the above activity, you note that, the growth of roots continues in the jar B. But in jar A, the roots stop growing. As a result, the length of roots in jar A is less than in jar B. Why so?



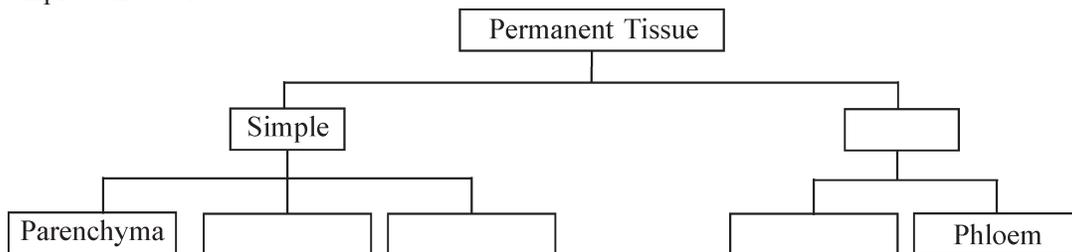
Jar A

Jar B

Length of root (in cm)	Jar A	Jar B
Day 1		
Day 2		
Day 3		
Day 4		

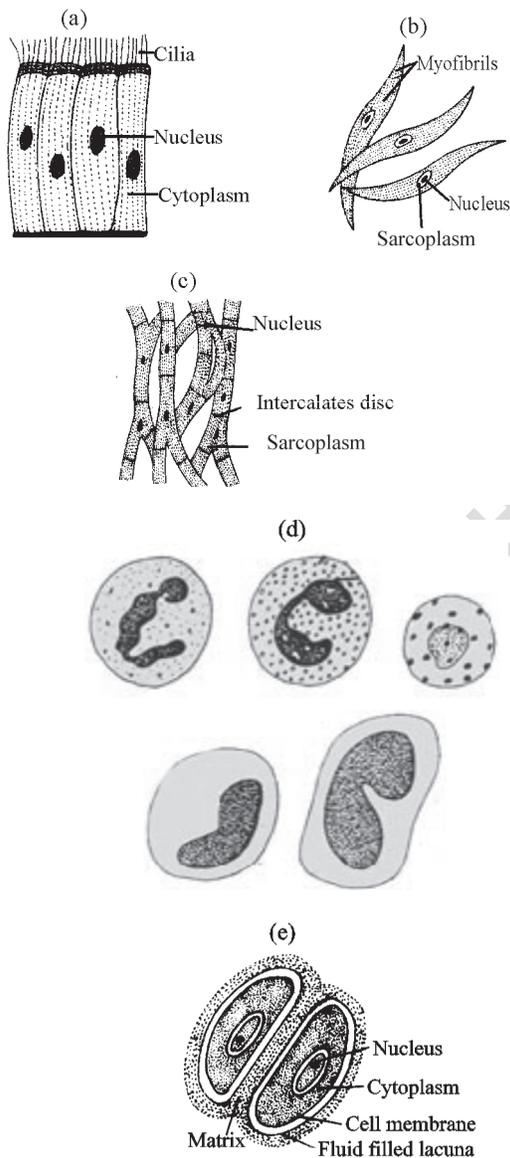
This is because the growth of plants occurs only at certain specific regions, where the dividing tissue called the **meristemic tissue** is present. When the tips of the roots in jar A are cut, this tissue is cut. Hence, the growth stops.

3. Complete the table :



B. Quiz

- Name the following :
 - Tissue that forms the inner lining of our mouth.
 - Tissue that connects muscle to bone in humans.
 - Tissue that transport food in plants.
 - Tissue that stores fat in our body.
 - Connective tissue with a fluid matrix.
 - Tissue present in the brain.
- Name the different body organs of humans where the following tissues are found :



C. Puzzle

Search the name of 6 types of cells found in blood from the given table vertically, horizontally or diagonally.

- _____
- _____
- _____
- _____
- _____
- _____

L	C	X	N	S	T	L	A	S	P
E	Y	U	S	E	Q	M	C	O	L
U	I	M	D	P	L	A	S	M	A
C	H	T	P	U	X	E	R	T	T
O	P	H	T	H	F	S	B	S	E
C	O	B	A	S	O	P	H	I	L
Y	M	M	O	N	O	C	Y	T	E
T	S	O	S	E	T	G	Y	F	T
E	O	N	A	L	T	N	H	T	S
I	E	K	E	U	I	C	O	P	E

D. Seminar

Topic — Fluid Connective Tissue.

(Hints : Following topics should be covered

- Contribution of plasma
- Transport of food materials
- Role in temperature regulation within the body
- Blood clotting
- Maintaining the blood pressure.

Class IX Chapter 6 – Tissues Science

Question 1:

What is a tissue?

Answer:

Tissue is a group of cells that are similar in structure and are organised together to perform a specific task.

Question 2:

What is the utility of tissues in multi-cellular organisms?

Answer:

In unicellular organisms, a single cell performs all the basic functions such as respiration, movement, excretion, digestion, etc. But in multicellular organisms, cells are grouped to form tissues. These tissues are specialised to carry out a particular function at a definite place in the body. For example, the muscle cells form muscular tissues which helps in movement, nerve cells form the nervous tissue which helps in transmission of messages. This is known as division of labour in multicellular

organisms. It is because of this division of labour that multicellular organisms are able to perform all functions efficiently.

Name types of simple tissues.

Answer:

Simple permanent tissues are of three types: Parenchyma, Collenchyma, and Sclerenchyma. Parenchyma tissue is of further two types – aerenchyma and chlorenchyma.

Question 2:

Where is apical meristem found?

Answer:

Apical meristem is present at the growing tips of stems and roots. Their main function is to initiate growth in new cells of seedlings, at the tip of roots, and shoots.

Question 3:

Which tissue makes up the husk of coconut?

Answer:

The husk of a coconut is made up of sclerenchyma tissue.

Question 4:

What are the constituents of phloem?

Answer:

Phloem is the food conducting tissue in plants. It is made up of four components:

- (i) Sieve tubes
- (ii) Companion cells
- (iii) Phloem parenchyma
- (iv) Phloem fibres

Name the tissue responsible for movement in our body.

Answer:

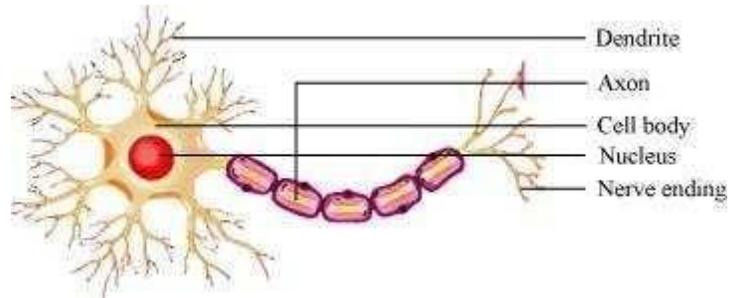
The muscular tissue is responsible for movement in our body.

Question 2:

What does a neuron look like?

Answer:

A neuron consists of a cell body with a nucleus and cytoplasm. It has two important extensions known as the axon and dendrites. An axon is a long thread-like extension of nerve cells that transmits impulses away from the cell body. Dendrites, on the other hand, are thread-like extensions of cell body that receive nerve impulses. Thus, the axon transmits impulses away from the cell body, whereas the dendrite receives nerve impulses. This coordinated function helps in transmitting impulses very quickly.



Nerve cell

Question 3:

Give three features of cardiac muscles.

Answer:

Three features of cardiac muscles are:

- (i) Cardiac muscles are involuntary muscles that contract rapidly, but do not get fatigued.
- (ii) The cells of cardiac muscles are cylindrical, branched, and uninucleate.

(iii) They control the contraction and relaxation of the heart.

Question 4:

What are the functions of areolar tissue?

Answer:

Functions of areolar tissue:

- (i) It helps in supporting internal organs.
- (ii) It helps in repairing the tissues of the skin and muscles.

Question 1:

Define the term "tissue".

Answer:

Tissue is a group of cells that are similar in structure and are organized together to perform a specific task.

Question 2:

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

Answer:

There are four different types of cells that make up the xylem tissue. They are:

(i) Tracheids

(ii) Vessels

(iii) Xylem parenchyma

(iv) Xylem fibres

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.

<p>The cells are more or less similar in structure and perform similar functions.</p>	<p>Different types of cells perform different functions. For example, in the xylem tissue, tracheids help in water transport, whereas parenchyma stores food.</p>
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<p>Three types of simple tissues in plants are parenchyma, collenchyma, and sclerenchyma.</p>	<p>Two types of complex permanent tissues in plants are xylem and phloem.</p>
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Question 4:

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

Answer:

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

Question 5:

What are the functions of the stomata?

Answer:

Functions of the stomata:

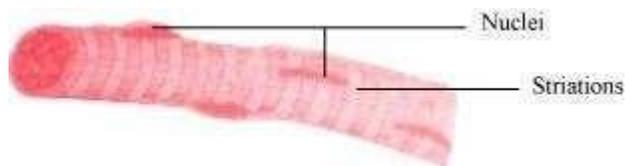
- (i) They allow the exchange of gases (CO_2 and O_2) with the atmosphere.
- (ii) Evaporation of water from the leaf surface occurs through the stomata. Thus, the stomata help in the process of transpiration.

Question 6:

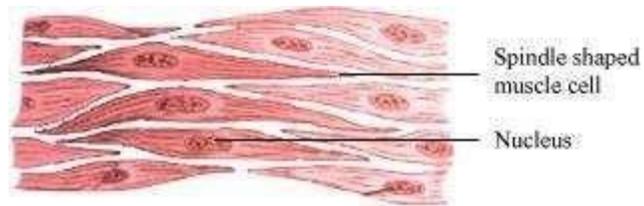
Diagrammatically show the difference between the three types of muscle fibres.

Answer:

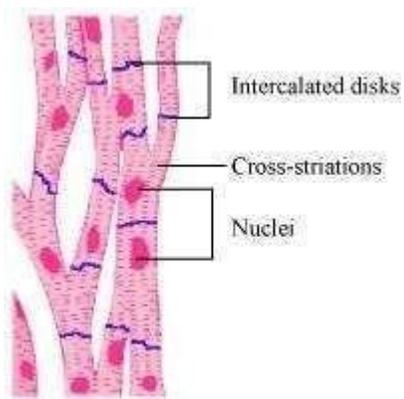
The three types of muscle fibres are: Striated muscles, smooth muscles (unstriated muscle fibre), and cardiac muscles.



Striated muscle fibres



Unstriated muscle fibres



Cardiac muscle fibres

Question 7:

What is the specific function of the cardiac muscle?

Answer:

The specific function of the cardiac muscle is to control the contraction and relaxation of the heart.

Question 8:

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

Answer:

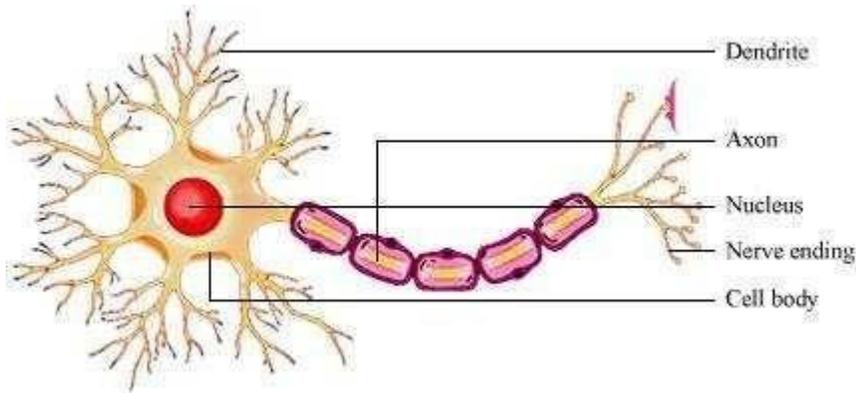
Striated muscle	Unstriated muscle	Cardiac muscle
On the basis of structure:		
Cells are cylindrical	Cells are long	Cells are cylindrical

Cells are not branched	Cells are not branched	Cells are branched
Cells are multinucleate	Cells are uninucleate	Cells are uninucleate
Alternate light and dark bands are present	There are no bands present	Faint bands are present
Its ends are blunt	Its ends are tapering	Its ends are flat and wavy
On the basis of location :		
These muscles are present in body parts such as hands, legs, tongue, etc.	These muscles control the movement of food in the alimentary canal, the contraction and relaxation of blood vessels, etc.	These muscles control the contraction and relaxation of the heart

Question 9:

Draw a labelled diagram of a neuron.

Answer:



Structure of a neuron

Question 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.

Answer:

- (a) Tissue that forms the inner lining of our mouth → Epithelial tissue
- (b) Tissue that connects muscle to bone in humans → Dense regular connective tissue (tendons)
- (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

(f) Tissue present in the brain → Nervous tissue Question 11:

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

Answer:

Skin: Stratified squamous epithelial tissue

Bark of tree: Simple permanent tissue

Bone: Connective tissue

Lining of kidney tubule: Cuboidal epithelial tissue

Vascular bundle: Complex permanent tissue Question 12:

Name the regions in which parenchyma tissue is present.

Answer:

Leaves, fruits, and flowers are the regions where the parenchyma tissue is present.

Question 13:

What is the role of epidermis in plants?

Answer:

Epidermis is present on the outer surface of the entire plant body. The cells of the epidermal tissue form a continuous layer without any intercellular space. It performs the following important functions:

(i) It is a protective tissue of the plant body

(ii) It protects the plant against mechanical injury (iii) It allows exchange of gases through the stomata

Question 14:

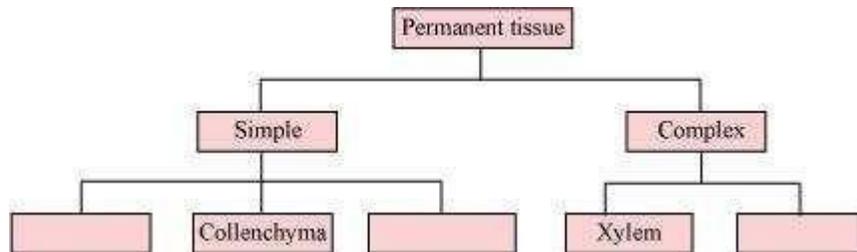
How does the cork act as a protective tissue?

Answer:

The outer protective layer or bark of a tree is known as the cork. It is made up of dead cells. Therefore, it protects the plant against mechanical injury, temperature extremes, etc. It also prevents the loss of water by evaporation.

Question 15:

Complete the table:



Answer:

