



Class: IX	DEPARTMENT OF SCIENCE -2023-24 SUBJECT: BIOLOGY	DATE OF COMPLETION: 05.09.23
WORKSHEET NO:3 WITH ANSWERS	TOPIC: PLANT TISSUE	A4 FILE FORMAT (PORTFOLIO)
CLASS & SEC	NAME OF THE STUDENT:	ROLL NO.

I. MULTIPLE CHOICE QUESTIONS:

1. A mature sieve tube is different from a vessel in
 - a) Lacking a functional nucleus
 - b) Absence of lignin in walls
 - c) Being dead
 - d) Lacking cytoplasm
2. The conducting cells of xylem are:
 - a) Tracheid and xylem fibres
 - b) Vessels and xylem fibres
 - c) Tracheid and vessels
 - d) Vessels and sieve tubes
3. The substance found in cell wall of cork or bark that makes it impervious to water is:
 - a) Lignin
 - b) Cutin
 - c) Suberin
 - d) Pectin
4. Meristematic tissues in plants are
 - a) localised and permanent
 - b) not limited to certain regions
 - c) localised and dividing cells
 - d) growing in volume
5. Cells of intercalary meristem lacks
 - a) vacuoles
 - b) nuclei
 - c) cytoplasm
 - d) cell wall

6. Parenchyma cells are
- relatively unspecified and thin walled
 - thick walled and specialised
 - lignified
 - None of the above
7. The permanent tissue, collenchyma provides ...(A)... and ...(B)... to plants.
- (A)-food, (B)-water
 - (A)-flexibility, (B)-mechanical support
 - (A)-buoyancy, (B)-support
 - (A)-flexibility, (B)-buoyancy
8. In desert plants, rate of water loss gets reduced due to the presence of
- cutin
 - stomata
 - lignin
 - suberin
9. Cork cells are made impervious to water and gases by the presence of
- cellulose
 - lipids
 - suberin
 - lignin
10. A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is
- collenchyma
 - xylem parenchyma
 - parenchyma
 - xylem vessels
11. The dead element present in the phloem is
- companion cells
 - phloem fibres
 - phloem parenchyma
 - sieve tubes

II. **ASSERTION AND REASONING:**

For the questions 9 to 8, two statements are given-one labelled Assertion (A) and the other labelled Reason(R). Select the correct answer to these questions from the options (i), (ii), (iii) and (iv) as given below:

- Both A and R are true, and R is the correct explanation of the assertion.
- Both A and R are true, but R is not the correct explanation of the assertion.

- iii. A is true but R is false.
- iv. A is false but R is true.

12. **Assertion (A):** The growth of plants occurs only in certain specific regions.

Reason (R): The meristematic tissue is found all over the plant body.

- a) Both A and R are true, and R is correct explanation of the A
- b) Both A and R are true, but R is not the correct explanation of the A
- c) A is true, but R is false
- d) A is false, but R is true

13. **Assertion (A): Apical meristem is present at shoot and root tips.**

Reason (R): It helps in the longitudinal growth of plants.

- a) Both A and R are true, and R is correct explanation of the A
- b) Both A and R are true, but R is not the correct explanation of the A
- c) A is true, but R is false
- d) A is false, but R is true

14. **Assertion (A): Sclerenchyma tissue are long, narrow and thick wall.**

Reason (R): The walls of these tissue are thickened due to presence of lignin.

- a) Both A and R are true, and R is correct explanation of the A
- b) Both A and R are true, but R is not the correct explanation of the A
- c) A is true, but R is false
- d) A is false, but R is true

15. **Assertion (A): Epidermal cells aids in protection against loss of water and mechanical injury.**

Reason (R): They secrete waxy, water resistance layer on their outer surface.

- a) Both A and R are true, and R is correct explanation of the A
- b) Both A and R are true, but R is not the correct explanation of the A
- c) A is true, but R is false
- d) A is false, but R is true

16. **Assertion (A): Water hyacinth can float on water surface.**

Reason (R): Aerenchyma tissue is present in water hyacinth.

- a) Both A and R are true, and R is correct explanation of the A
- b) Both A and R are true, but R is not the correct explanation of the A
- c) A is true, but R is false
- d) A is false, but R is true

III. PASSAGE BASED QUESTIONS:

The outermost layer of the cells is called epidermis. The epidermis is usually made of a single layer of cells. In some plants living in very dry habitats, epidermis may be thicker since protection against water loss is critical. The entire surface of a plant has an outer covering of epidermis. It protects all the parts of the plant. Epidermal cells on the aerial parts of the plant

often secrete a waxy, water-resistant layer on their outer surface. That aids in protection against loss of water, mechanical injury and invasion by parasitic fungi. Since, it has a protective role to play, cells of epidermal tissue form a continuous layer without intercellular spaces. Most epidermal cells are relatively flat. Often their outer and side walls are thicker than the inner wall. Woody stems and structures like potato tubers, produce a second covering called periderm.

17. Walls of epidermal cells contain

- a) chloroplast
- b) chlorophyll
- c) cutin
- d) lignin

18. Which of the following is not a function performed by epidermis?

- a) Protection against mechanical injury
- b) Protection against insects
- c) Protection against waterless
- d) Regulation of gaseous exchange

19. Epidermal tissue system consists of

- a) epidermal cells
- b) stomata
- c) roots
- d) All of these

The growth of plants occurs only in certain specific regions. This is because the dividing tissue, also known as meristematic tissue, is located only at these points. The meristematic tissues are classified as apical, lateral and intercalary depending on the region where they are present. Apical meristem is present at the growing tips of stems and roots, and it increases the length of the stem and root. The girth of the stem and root increases due to lateral meristem (cambium). Intercalary meristem is located near the node in grasses.

20. How many types of meristematic tissue are found in plants? Name them.

21. The increase in the length of stem and root occurs due to which type of meristem.

22. How elongation occurs in sugarcane stem?

IV. a) SHORT ANSWER TYPE QUESTIONS (2M):

23. Name the tissue which is present at the growing tips of stem and roots.

24. Name the tissue which allows easy bending in various parts of a plant.

25. Which structure protects the plant body against the invasion of parasites?

26. What is lignin.

27. What do you mean by differentiation?

28. Which type of permanent tissue does carrot contain?

29. Which type of permanent tissue help the aquatic plants to float?
 30. i) Identify the tissue shown in the figure.
 (ii) Specify any parts of the plant where such cells are present.



IV. b) SHORT ANSWER TYPE QUESTIONS (3 M):

31. (i) Identify this tissue.
 (ii) Infer the characteristic features of these cells.
 (iii) Specify the function of this tissue.
 (iv) Name any one part of the plant where these cells are present.



32. Name the different components of xylem and draw a living component.
 33. List the constituents of phloem. What will happen if the phloem at the base of branch is removed?
 34. Write four important characteristics of meristematic tissues.
 35. Give difference between the following
 i. Simple and complex tissues
 ii. Chlorenchyma and Aerenchyma
 36. What are cork tissues? How are they formed?
 37. Name the type of tissue
 a) Supplies a plant with food
 b) Transport water in a plant.
 c) Lines the surface of a leaf.
 38. Why are xylem and phloem called complex tissue? How are they different from one another?
 39. Water hyacinth floats on water surface. Explain.
 40. Give reasons
 a) We get a crunchy and granular feeling, when we chew guava fruit.
 b) Branches of a tree move and bend freely in high wind velocity
 41. Cells of epidermal tissue form a continuous layer without intercellular space. Why?

V. LONG ANSWER TYPE QUESTIONS (5M):

42. Give reasons for
 a) Meristematic cell has prominent nucleus and dense cytoplasm, but they lack vacuole.
 b) Intercellular spaces are absent in sclerenchymatous tissue.
 c) We get crunchy and granular feeling when we chew pear fruit.
 d) Branches of tree moves and bend freely in high wind velocity.
 e) It is difficult to pull out husk of coconut.
 43. Describe the structure and function of stomata.
 44. Make a table showing, the structure, location, function of parenchyma, collenchyma and sclerenchyma respectively.
 45. Draw a well labelled diagram, showing the location of meristematic tissue in plant body. Explain the function of each part in detail.

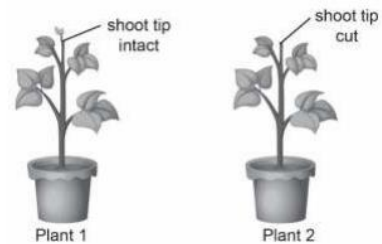
46. i) Name the outermost layer present in plants
 ii) Give the characteristic features of this layer.
 iii) What are the different roles played by this layer?

VI. BOARD BASED QUESTIONS

47. Multicellular organisms show division of labour. Explain with the help of an example.
 48. What are the different elements present in xylem? Give the functions performed by each one.
 49. Explain the following terms:
 a) Cuticle
 b) Cork
 50. a) Differentiate between xylem and phloem based on the following features:
 i. Nature of cell elements
 ii. Function
 b) Draw a neat, labelled diagram of xylem elements
 51. If a potted plant is covered with a glass jar, water vapours appear on the wall of glass jar. Explain.

VII. COMPETENCY BASED QUESTIONS

52. Apical meristem is a type of tissue that helps plants grow in length. Tina took two identical potted plants and cut the shoot tip of one of them. She observed if the two plants grew in height after a week.



- i) What was Tina trying to find about shoot tips through her experiment?
 ii) Which of these conditions would have made Tina’s experiment invalid? Circle ‘Yes’ or ‘No’ to mark your responses.

Would this have made the experiment invalid?	Yes/No
Keeping one plant in sunlight and the other in a dark room	Yes/No
Watering both the plants equally	Yes/No
Adding manure to the soil of plant 1 only	Yes/No

- iii) Why do cells of apical meristem lack vacuoles
 a) They store food materials.
 b) They have thin cell walls
 c) They contain dense cytoplasm
 d) They are actively dividing cells.

53. Stomata are minute openings found in the epidermis of plant leaves. Each stoma allows carbon dioxide, oxygen and water vapour to diffuse in and out of a plant's internal tissues.

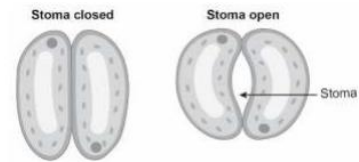


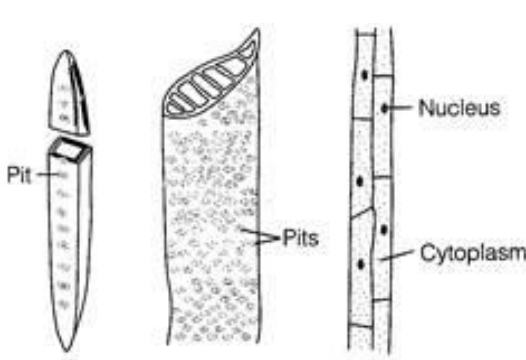
Figure 1

Figure 2

- i) Each stoma is surrounded by a pair of elongated cells. What is this pair of cells known as?
- ii) Why do desert plants have smaller and fewer stomata as compared to rainforest plants? Explain your answer.

ANSWERS

1.	b) absence of lignin in walls
2.	c) tracheid and vessels
3.	c) suberin
4.	c) localized and dividing cells
5.	a) vacuoles
6.	a) relatively unspecified and thin walled
7.	b) (A)-flexibility, (B)-mechanical support
8.	a) Cutin
9.	c) Suberin
10.	b) xylem parenchyma
11.	b) phloem fibres
12.	c) A is true, but R is false
13.	b) Both A and R are true, but R is not the correct explanation of the A
14.	a) Both A and R are true, and R is correct explanation of the A
15.	a) Both A and R are true, and R is correct explanation of the A
16.	a) Both A and R are true, and R is correct explanation of the A
17.	c) cutin
18.	b) Protection against insects
19.	d) All of these
20.	Apical, lateral, intercalary
21.	Apical meristem

22.	Sugarcane stem elongates due to intercalary meristem which is present at the base of internode
23.	apical meristem
24.	Collenchyma is a kind of Simple permanent tissues Provides flexibility to plant parts which allows easy bending in various parts of a plant.
25.	The dermal tissue of plants and hard cuticle covering protect the plant body from invasion of parasites and other harmful agents.
26.	Lignin is a complex polymer that is present in Schlerenchymatic tissues. Lignin is waterproof material.
27.	The cells of permanent tissue loose the capacity to divide and attain a permanent shape, size and function
28.	Parenchyma. Parenchyma is the type of plant tissue that stores food. So, carrot and all other fruits and vegetables contain parenchyma tissue.
29.	Aerenchyma is that type of parenchyma tissue that contains air cavities which help the aquatic plants to float.
30.	(i) Sclerenchyma matous cells are found in (ii) (a) Vascular bundles
31.	(i) It is collenchyma. (ii) The cells of collenchyma are living, elongated, thickened at the corners and have very little intercellular space. (iii) It provides mechanical support to the plant. (iv) It is present in leafstalk.
32.	<p>Components of xylem are tracheid, vessels, xylem fibres and xylem parenchyma.</p>  <p>Living component of Xylem (a) Tracheid (b) Vessel (c) Xylem parenchyma</p>
33.	Constituents of phloem are Sieve tubes, companion cells, phloem fibres and phloem parenchyma. If the phloem at the base of branch is removed, then lower area of the branch will not receive food from the leaves. But the plant will not die, as it will continue to receive food from other branches as food can move in phloem in both the directions.

34.	Meristematic tissues lose the ability to divide. As a result, they form a permanent tissue. This process of taking up a permanent shape, size and a function is called differentiation.
35.	i) Simple Tissues: Tissues made up of one type of cells, which look like each other. Complex tissues: Complex tissues are made up of more than one type of cells. All these cells coordinate to perform a common function ii) Chlorenchyma: In some situations. Parenchyma cells contain chlorophyll and perform photosynthesis known as chlorenchyma. Aerenchyma: In aquatic plants. Large air cavities are present in parenchyma to give buoyancy to the plants to help them flow known as Aerenchyma.
36.	As plants grow older, the outer protective tissue undergoes certain changes. A strip of secondary meristem. replaces the epidermis of the stem. Cells on the outside are cut off from this layer. This forms the several layer thick cork or bark of the tree. They are compactly arranged without intercellular space.
37.	a) Phloem b) Xylem. c) Stomata.
38.	Xylem and phloem are called complex tissues because they are made up of different types of cells. Phloem transports food and Xylem transports water. Xylem tissue consists of a variety of specialized, water-conducting cells known as tracheary elements. The basic function of xylem is to transport water from roots to stems and leaves.
39.	Presence of aerenchyma, explanation of aerenchyma and mention the functions
40.	a) Due to the presence of sclerenchyma cells in the pulp b) Collenchyma is present, provides flexibility and easy bending
41.	Single layered and compactly arranged to perform their functions, mention the functions
42.	(i) Meristematic cells undergo division and do not store food. (ii) Because their walls are lignified and form bundles for mechanical function. (iii) Due to presence of sclerenchymatous cell (stone cell) or sclereids we get a crunchy feeling when we chew pear fruit. (iv) Presence of collenchyma provides flexibility to the branches of tree. (v) Husk of coconut is made up of sclerenchymatous fibres which are closely packed.
43.	Stomata are present in the epidermis of leaves as pores are enclosed by two kidney-shaped cells called guard cells. Function of stomata: (a) Necessary for exchanging gases with the atmosphere during photosynthesis and respiration. (b) Transpiration, i.e., loss of water takes place through them.

		Parenchyma	Collenchyma	Sclerenchyma
44.	Structure	Relatively unspecialized cells. Thin cell wall, live cells, Loosely packed , large space in between the cells	Living, elongated, irregularly thickened	Dead tissue, They are long and narrow, Walls are thickened due to lignin, cells are closely packed, no intercellular space in between the cells.
	Location	Stem, root, leaves. Flower	In leaf stalks below the epidermis	In the veins of the leaves, in stems, around vascular bundles, in the hard coverings of seeds and nuts.
	Function	Stores nutrients and water, provides support to the plant	It allows easy bending in various parts of a plant without breaking.	Makes the plant hard and stiff, Provides strength to the plant parts.
45.	Diagram from tb			
46.	i) Epidermis ii) Features – single layered, compactly arranged, no intercellular space, outer and lateral walls are thick iii) Functions – any four			
47.	Formation of organ which is a part of an organ system of an individual Performs a specialised activity or function. It increases the efficiency of the individual. It shows division of labour. Increases the chances of survival of individual.			
48.	Tracheid and vessels – transport of water and minerals, parenchyma- storage and lateral conduction, fibres – mechanical support			
49.	Cuticle – outermost waxy coating, prevents water loss Cork – Replaces epidermis, impervious			
50.	a) Elements of xylem and phloem, functions b) Diagram			
51.	Due to transpiration, loss of water in the form of water vapour through stomata			

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