INDIAN SCHOOL AL WADI AL KABIR		
Class: IX	**DEPARTMENT OF SCIENCE:2024-25** **SUBJECT: BIOLOGY**	**DATE OF COMPLETION: 22-08-2024**
WORKSHEET NO: 3 WITH ANSWERS	**TOPIC: TISSUES-PLANT TISSUE**	**A4 FILE FORMAT (PORTFOLIO)**
CLASS & SEC	**NAME OF THE STUDENT:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS:

1. Chloroplasts may occur in:
   a. Sclerenchyma
   b. Chlorenchyma
   c. Sieve tubes
   d. Phloem fibres
2. The dead element present in the phloem is:
   a. Companion cells
   b. Phloem fibres
   c. Phloem parenchyma
   d. Sieve tubes
3. The conducting cells of the xylem are:
   a. Tracheid and xylem fibres
   b. Vessels and xylem fibres
   c. Tracheid and vessels
   d. Vessels and sieve tubes
4. The substance found in the cell wall of cork or bark that makes it impervious to water is:
   a. Lignin
   b. Cutin
   c. Suberin
   d. Pectin
5. Girth of stem increases due to:
   a. Apical meristems
   b. Lateral meristems
   c. intercalary meristems
   d. Vertical meristems

6. In desert plants, the rate of water loss gets reduced due to the presence of:
   a. Cutin
   b. Stomata
   c. Lignin
   d. Suberin

7. A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is:
   a. Collenchyma
   b. xylem parenchyma
   c. Parenchyma
   d. Xylem vessels

For the questions 8 to 12, 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:

- ***i. Both A and R are true, and R is the correct explanation of the assertion.***
- ***ii. 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.***

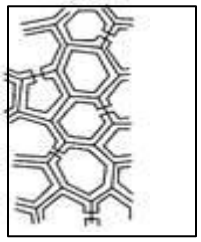
8. **Assertion (A):** The growth of plants occurs only in certain specific regions.
   Reason (R): The meristematic tissue is found all over the plant body.

9. **Assertion (A):** Apical meristem is present at shoot and root tips.
   Reason (R): It helps in the longitudinal growth of plants.

10. **Assertion (A):** Plant tissues are mostly dead.
    Reason (R): Dead tissues can provide mechanical strength and need less maintenance
11. **Assertion (A):** Epidermal cells aid in protection against loss of water and mechanical injury.
    Reason (R): They secrete a waxy, water-resistant layer on their outer surface

12**. Assertion (A):** Water hyacinth can float on the water surface.
    Reason (R): Aerenchyma tissue is present in water hyacinth.

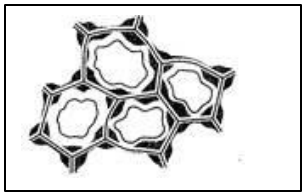
II. SHORT ANSWER TYPE QUESTIONS (2M):



13. Identify the tissue:
    a. Present at the growing tips of the stem and roots.
    b. Allows easy bending in various parts of a plant.

14. Which structure protects the plant body against the invasion of parasites?
15. What is lignin?
16. Which type of permanent tissue does carrot contain? Why?
17. i) Identify the tissue shown in the figure.
    ii) Specify any parts of the plant where such cells are present.

III.SHORT ANSWER TYPE QUESTIONS (3 M):



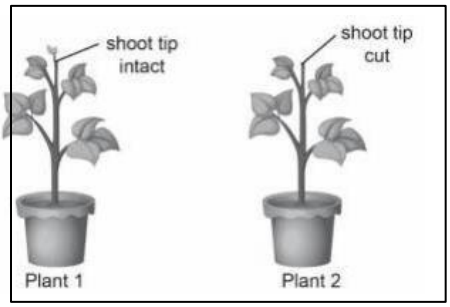
18. Observe the given figure and answer the following questions-
    i) Identify the tissue given alongside
    ii) Mention the characteristic features of these cells.
    iii) Specify the function of this tissue.
    iv) Name any part of the plant where these cells are present.
19. Name the different components of the xylem and draw a living component.
20. List the constituents of phloem. What will happen if the phloem at the base of the branch is removed?
21. Write four important characteristics of meristematic tissues.
22. Give the difference between the following
    i) Simple and complex tissues
    ii) Chlorenchyma and Aerenchyma
23. What are cork tissues? How are they formed?
24. Why are the xylem and phloem called complex tissue? How are they different from one another?
25. Cells of epidermal tissue form a continuous layer without intercellular space. Why?

IV.LONG ANSWER TYPE QUESTIONS (5M):

26. Give reasons for
    a. Meristematic cell has prominent nucleus and dense cytoplasm, but they lack vacuole.
    b. Intercellular spaces are absent in sclerenchyma tissue.
    c. It is difficult to pull out the husk of coconut.
    d. We get a crunchy and granular feeling when we chew guava fruit.
    e. Branches of a tree move and bend freely in high wind velocity
27. Draw a neat diagram of leaf epidermal peel showing stomata. Also, describe the structure and function of stomata.
28. Make a table showing, the structure, location, and function of parenchyma, collenchyma and sclerenchyma respectively.
29. Draw a well-labelled diagram, showing the location of meristematic tissue in the plantbody. Explain the function of each part in detail.
30. 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?
31. Multicellular organisms show division of labour. Explain with the help of an example.
32. What are the different elements present in the xylem? Give the functions performed by each one.

V. CASE STUDY-BASED QUESTIONS

33. Apical meristem is a type of tissue that helps plants grow in length. Tina took two identical potted plantsand 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?

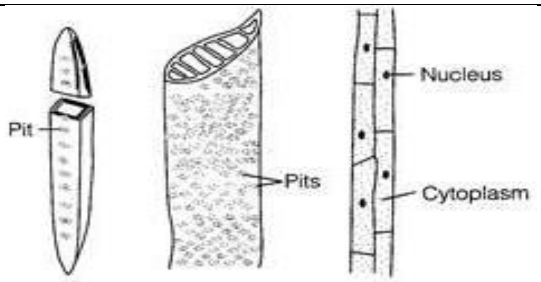
ii) Which of these conditions would have made Tina's experiment invalid? Circle 'Yes'or 'No' to mark your responses.

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 plants equally	Yes/No
Adding manure to the soil of Plant 1 only	Yes/No

iii) What will happen if the apical meristem is damaged or cut?

ANSWERS

I. OBJECTIVE TYPE QUESTIONS (1 MARK)	
1	b. Chlorenchyma
2	b. Phloem fibres
3	c. Tracheid and vessels
4	c. Suberin
5	b. Lateral meristems
6	a. Cutin
7	b. xylem parenchyma
8	iii. A is true but R is false.
9	i. Both A and R are true, and R is the correct explanation of the assertion.
10	i. Both A and R are true, and R is the correct explanation of the assertion.
11	i. Both A and R are true, and R is the correct explanation of the assertion.
12	i. Both A and R are true, and R is the correct explanation of the assertion.
II. SHORT ANSWER TYPE QUESTIONS (2 MARKS)	
13	a. Apical meristem is present at the growing tips of stems and roots and increases the length of the stem and the root. b. The flexibility in plants is due to collenchyma. It allows easy bending in various parts of a plant (leaf, stem) without breaking.
14	The epidermis provides protection to plants against the invasion of parasites. It forms an outer covering of plant organs which remains in direct contact with the environment. This epidermis is further covered by a layer of fatty substance called cuticle.
15	Lignin is a complex polymer that is present in Sclerenchyma tissues. Lignin is a waterproof material.
16	Parenchyma is the type of plant tissue that stores food. So, carrots and all other fruits and vegetables contain parenchyma tissue
17	(i) Sclerenchyma tissue (ii) Vascular bundles
III. SHORT ANSWER TYPE QUESTIONS (2MARKS)	
18	(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.
19	Components of the xylem are the tracheid, vessels, xylem fibres and xylem parenchyma.

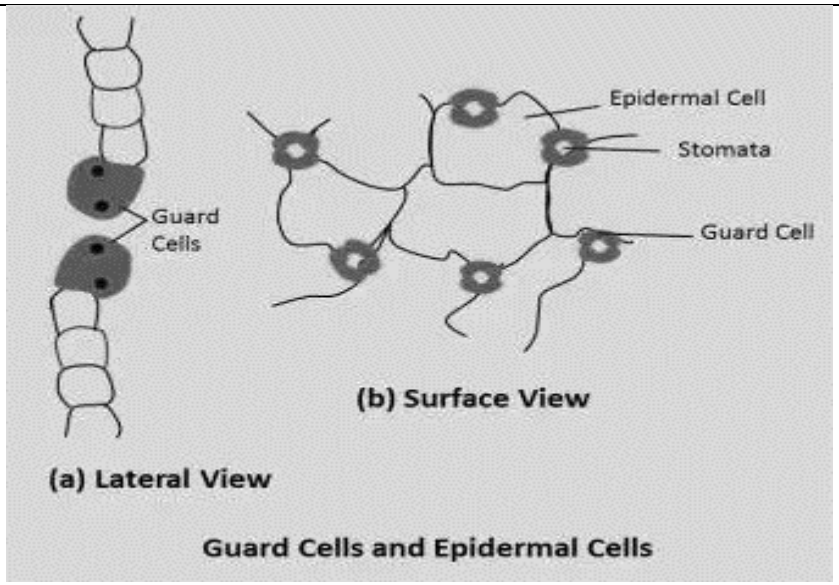
	 Living component of Xylem (a) Tracheid (b) Vessel (c) Xylem parenchyma
20	Constituents of phloem are Sieve tubes, companion cells, phloem fibres and phloem parenchyma. If the phloem at the base of the branch is removed, then the lower area of the branch will not receive food from the leaves. But the plant will not die, as it will continue to receive food from other branches as food can move in phloem in both directions.
21	They are made up of immature cells. They have the capability to differentiate into any cell. They are living and thin-walled. They have a dense cytoplasm and a prominent nuclei.
22	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 and they are known as chlorenchyma. Aerenchyma: In aquatic plants. Large air cavities are present in the parenchyma to give buoyancy to the plants to help them flow known as Aerenchyma.
23	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.
24	The 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.
25	The tight arrangement of the cells leaves no intercellular space due to which the epidermis is able to provide protection against mechanical injury and pathogenic microbes. This layer also prevents water loss as no space is present between the cells.

LONG ANSWER TYPE QUESTIONS (5 MARKS)

26

a. Meristematic cells have a prominent nucleus and a dense cytoplasm but lack a vacuole, this is so because meristematic cells have an ability to divide and form new cells. They do not store food.
b. Because their walls are lignified and form bundles for mechanical function.
c. Husk of coconut is made up of sclerenchymatous fibres which are closely packed.
d. Due to the presence of sclerenchymatous cells (stone cells) or sclereids we get a crunchy feeling when we chew a guava fruit.
e. The presence of collenchyma provides flexibility to the branches of the tree.

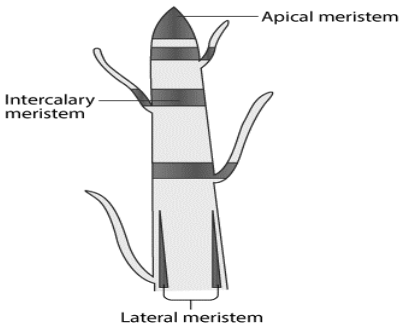
27



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.

28

	Parenchyma	Collenchyma	Sclerenchyma
Structure	Relatively unspecialised 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.

<table>
<tr><td></td><td></td><td>Location</td><td>Stem, root, leaves. Flower</td><td>In leaf stalks belowthe epidermis</td><td>In the veins of the leaves, instems, around vascular bundles, in the hard coverings of seeds and nuts.</td></tr>
<tr><td></td><td></td><td>Function</td><td>Stores nutrients and water, provides support to the plant</td><td>It allows easy bending in various parts of a plant without breaking.</td><td>Makes the plant hard and stiff and provides strength tothe plant parts.</td></tr>
<tr><td>29</td><td colspan="5">Meristematic tissues are the tissues in which the cells divide continuously and help in increasing the length and girth of the plant.
 

According to their position in the plant, meristems are of three types:
a) Apical Meristems - These are situated at the growing tip of the stems and roots and increase the height of the plant.

b) Lateral Meristems - These are found beneath the bark and in vascular bundles of dicot roots and stems. These are responsible for the growth of cambium and hence increase the girth of the plant.

c) Intercalary Meristems - They are located at the base of leaves or internodes or below the nodes. It increases the length of the plant.</td></tr>
<tr><td>30</td><td colspan="5">i) Epidermis

ii) Features – single-layered, compactly arranged, no intercellular space, outer and lateral walls are thick

iii) The plant epidermis is a protective tissue that covers the entire surface of the plant. The epidermis protects the plant from invasion by parasitic fungi and water loss. It regulates the gas exchange in plant cells. The epidermis regulates the secretion of metabolic substances.</td></tr>
</table>

31	Multicellular organisms are made up of millions and trillions of cells. All these cells perform specific functions. All the cells specialised for performing similar functions are grouped together as tissues in the body. Hence, a particular function is carried out by a group of cells at a definite place in the body. Similarly, different functions are carried out by different groups of cells in an organism. This is known as the division of labour in multicellular organisms. E.g. Xylem and Phloem are two different types of vascular tissues, which are mainly involved in the transportation process. These tissues form a vascular bundle and these work together as a unit.
32	1. **Tracheids and vessels**- They are the main elements for conducting water. 2. **Xylem fibres** provide mechanical support 3. **xylem parenchyma** stores food materials and tannins and also conducts water sideways.
33	i. Mentions that Tina was trying to find out whether shoot tips contain apical meristem. ii. Yes, No, Yes iii. Apical meristems are present at the tips of roots and shoots. They form the growing parts of the roots and stems. If they are damaged or cut, the growth in length of that part will cease to occur.

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