Unit 1 · Plant Anatomy

WORKSHEET

Full marks 32

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 32

1 Key words [4]

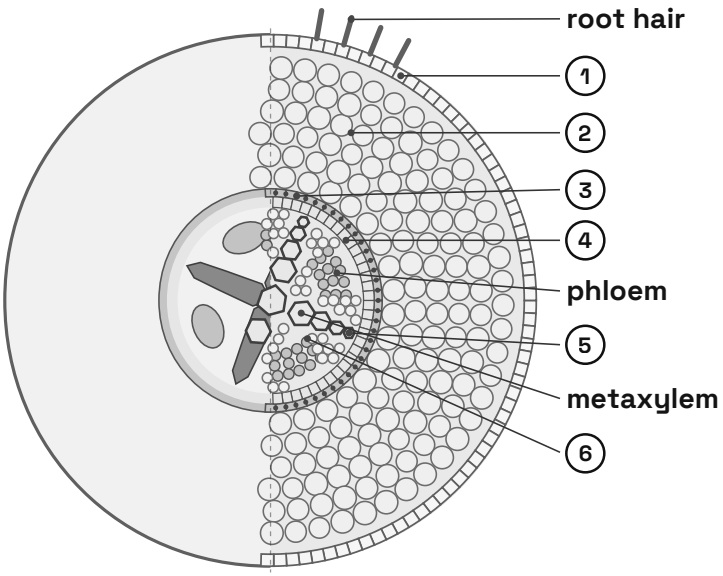
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

bulliform	**Casparian strip**	**collenchyma**	**companion cell**	**lignin**	**meristem**
phelloderm	**phellogen**	**plerome**	**tyloses**		

A group of actively dividing cells in the growing parts of a plant is a _____. The living mechanical tissue, its walls thickened at the corners with cellulose and pectin, is _____. The walls of sclerenchyma are hard and waterproof because of _____. A sieve tube element has no nucleus; its _____ does that work for it. Water can't slip between the endodermis cells of a root because of a band of suberin round their walls, the _____. In grasses, large water-filled _____ cells in the upper epidermis roll the leaf up in dry weather. The cork cambium is also called the _____. In heartwood, the vessels are plugged by balloon-like outgrowths called _____.

2 Label the diagram [3]

The diagram shows a transverse section of a young dicot root. Write the names of the parts 1 to 6. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. In exarch xylem, the protoxylem lies: [1]

a. towards the pith, inside the metaxylem
b. towards the periphery, outside the metaxylem
c. between the outer and inner metaxylem
d. in the center, surrounded by metaxylem

ii. Which of the following is a heterogeneous tissue? [1]

a. meristem **b.** parenchyma
c. sclerenchyma **d.** xylem

iii. Which of the following stops the conducting function of xylem elements? [1]

a. callose **b.** tyloses
c. suberin **d.** lignin

iv. In a section of a root you see 14 xylem strands alternating with 14 phloem strands round a large pith. What is it? [1]

a. a dicot root, because the bundles are radial
b. a monocot root: polyarch, with a large pith
c. a monocot stem, because the bundles are many
d. a dicot stem, because the bundles are in a ring

v. A bundle has phloem outside the xylem on one radius, and no cambium. What is it, and where would you find it? [1]

a. radial; in a root
b. conjoint, collateral and open; in a sunflower stem
c. conjoint, collateral and closed; in a maize stem
d. bicollateral; in a pumpkin stem

4 Short answers [9]

Write short answers to the following questions.

a. What is a complex permanent tissue? Name its two types. [2]

b. Write any two differences between a fiber and a sclereid. [2]

Science Playground, Katunje, Bhaktapur
https://science-playground.com/learn/grade-12-biology/plant-anatomy

c. A forester takes a core with an increment borer from a pine in Jumla, and another from a tree in a rainforest that is warm and wet all year. Which core will show clear annual rings? Why? **[2]**

d. What is the Casparian strip? Why is the endodermis called the biological check post of the root, and what are passage cells? **[3]**

5 Long answers **[8]**

Write long answers to the following questions.

a. Write any four differences between the anatomy of a dicot stem and a monocot stem. **[4]**

b. What is periderm? Describe its three layers, and say how a lenticel differs from the rest of the periderm. **[4]**

6 Think [3]

The cut end of a chir pine log shows many annual rings, a sal log from the Tarai only faint ones, and a bamboo culm none at all. Explain the three.

7 Activity: Lenticels and cork (not marked)

Look at a young twig of peach or mango and a potato tuber with a hand lens. Then leave a few potatoes in a damp place for a week and look again.

What you looked at	What you saw
the bark of a young twig	
the skin of a potato	
the potato after a week in a damp place	

What do lenticels do for the living cells under the bark?