



Degree: B.Sc.
Department: Botany and Microbiology
Year/Specialization: 1st year / General Science
Course Title: Anatomy Morphology
Course Code: B 101

Examination Date: 5/1/2026
Examination Time: 2 hours
Total Marks: 60 Marks
Number of Pages: 2
Academic Year/Semester: First

Answer All the following questions

I. Choose the correct answer: (20 marks)

1. Cells allow bending of plant parts without breaking and resist stress
a) Parenchyma b) collenchyma c) sclerenchyma d) meristem
2. Tracheid, fiber and parenchyma are components of xylem in
a) gymnosperm b) angiosperm c) mesosperm d) all types
3. Sclerenchyma is present in
a) pith b) cortex c) epidermis d) seed coat
4. Meristems lie along the sides of stem and root
a) apical b) lateral c) intercalary d) procambium
5. Living parenchyma cell arises from meristematic cell and is present in angiosperm
a) sieve plate b) albuminous c) companion d) sieve cell
6. The gel-like matrix that provides flexibility to the cell wall is formed by:
a) Cellulose b) Lignin c) Pectin d) Suberin
7. Lignin is mainly associated with:
a) Primary cell wall b) Middle lamella c) Secondary cell wall d) Plasma membrane
8. Which plastid is responsible for photosynthesis?
a) Chromoplast b) Leucoplast c) Amyloplast d) Chloroplast
9. Rough endoplasmic reticulum differs from smooth ER by the presence of:
a) Lipids b) Ribosomes c) Carbohydrates d) DNA
10. Mesophyll in dicot leaves is differentiated into:
a) Not differentiated b) Palisade, spongy, collenchyma c) Parenchyma only d) Sclerenchyma+parenchyma
11. Which type of root system is typical for monocots such as wheat or rice?
A) Taproot system B) Fibrous root system C) Adventitious root system D) Prop root system
12. Why are onion and garlic considered underground stem modifications?
A) Their roots store food B) Their leaves are underground C) They grow only in water
D) They have a reduced, disc-shaped stem pulled underground by contractile roots
13. Whorled insertion is characterized by:
A) One leaf per node B) Two leaves per node
C) Three or more leaves per node D) Leaves only at the base
14. What is the main function of internodes?
A) Elongation and spacing of leaves B) Storage of food C) Producing flowers D) Formation of roots
15. What is the main function of stilt roots?
A) Food storage B) Reproduction
C) Providing extra support and absorbing water and minerals D) Photosynthesis
16. In a pinnate compound leaf, the leaflets grow
a) Only at the tip b) On both sides of a central axis
c) Randomly along the stem d) From separate stems
17. What is the main function of the apical bud?
A) Producing flowers only B) Increasing stem thickness
C) Forming roots D) Increasing plant height

18. How do prop (pillar) roots develop?

- A) From the tip of the primary root B) From underground stems only
C) From branches or stems, hanging downward and entering the soil D) From leaves near the top of the plant

19. Reticulate venation is characterized by

- a) Veins running side by side b) Veins forming a network inside the leaf
c) No visible veins d) Veins only along the edges

20. Which statement correctly compares potato and strawberry?

- A) Potato has stolons below soil; strawberry has runners above soil B) Both form tubers above the soil
C) Both have runners below the soil D) Both reproduce mainly by seeds

II. Mark the following statements as True or False: (20 marks)

1. Exarch xylem develops centrifugally while endarch develops centripetally.
2. Phloem parenchyma is present in dicot.
3. Casparian strip transports water from cortex to xylem and re-enter water into cortex.
4. Xylem strands is tetrarch in dicot roots.
5. Phloem is surrounded by xylem in amphicribal bundle.
6. Chromoplasts are colorless plastids.
7. Ribosomes are composed of protein and RNA.
8. Vascular bundles in dicot stem are closed collateral V.B.
9. Root epidermis has cuticle and stomata like leaf epidermis.
10. Monocot leaf mesophyll is differentiated into palisade and spongy layers.
11. Roots have no leaves, nodes, or internodes. One of the main functions of roots is to fix the plant firmly in the soil.
12. Climbers are plants with weak stems that require support to grow upward.
13. The lamina is the part of the leaf where photosynthesis mainly occurs.
14. Contractile roots grow upward to lift the plant's bulbs closer to the soil surface.
15. Leaf arrangement refers to the way leaves are distributed on the stem.
16. Creepers and runners are both types of prostrate plants.
17. The number of pinna refers to how many times the leaflets are divided along the axis.
18. Respiratory roots are found in plants that grow in dry, sandy deserts.
19. The spaces between the eyes of a potato are called internodes.
20. Some leaves in nitrogen-poor soils adapt to trap and digest insects for nutrients.

III. Discuss the following questions (20 marks)

1. Meristematic types according to plane of cell division.
2. The function of the Dictyosome in plant cell.
3. The stem modification in Potato Tuber (*Solanum tuberosum*).
4. Mention briefly the types of plant leaves.

End of exam

Good luck