

**2 0 2 5**

( NEP—2020 )

( 5th Semester )

**BOTANY (MAJOR1)**

**( Plant Anatomy and Gymnosperms )**

*Full Marks : 75*

*Time : 3 hours*

*The figures in the margin indicate full marks for the questions*

**( SECTION : A—OBJECTIVE )**

( Marks : 10 )

Tick (✓) the correct answer in the brackets provided :

1×10=10

1. The archegonial neck of \_\_\_\_\_ is the longest amongst the gymnosperms.

- (a) *Pinus* ( )
- (b) *Taxus* ( )
- (c) *Ephedra* ( )
- (d) *Gnetum* ( )

2. An archegonium is absent in

- (a) *Ephedra* ( )
- (b) *Pinus* ( )
- (c) *Gnetum* ( )
- (d) *Taxus* ( )

3. Mesophyll cells are found in  
(a) leaf ( )  
(b) stem ( )  
(c) root ( )  
(d) All of the above ( )
4. Which of the following is meristematic tissue?  
(a) Cambium ( )  
(b) Phloem ( )  
(c) Xylem ( )  
(d) None of the above ( )
5. Xylem vessels are present in  
(a) *Gnetum* ( )  
(b) *Pinus* ( )  
(c) *Cycas* ( )  
(d) None of the above ( )
6. Medullary rays are seen in  
(a) dicot root ( )  
(b) monocot root ( )  
(c) dicot stem ( )  
(d) monocot stem ( )
7. Which of the following is not a type of simple permanent tissue in plants?  
(a) Parenchyma ( )  
(b) Collenchyma ( )  
(c) Sclerenchyma ( )  
(d) Xylem ( )
8. The primary function of the shoot apex in a plant is  
(a) water absorption ( )  
(b) photosynthesis ( )  
(c) growth and development of new tissues ( )  
(d) storage of food ( )

9. Which of the following is anatomical feature of a xerophyte?

- (a) Presence of aerenchyma ( )
- (b) Thin cuticle ( )
- (c) Sunken stomata ( )
- (d) Absence of root hairs ( )

10. Amphivasal vascular bundles are present in

- (a) mirabilis stem ( )
- (b) bignonia stem ( )
- (c) dracaena stem ( )
- (d) boerhavia stem ( )

**( SECTION : B—SHORT ANSWERS )**

( Marks : 15 )

Write short notes on *five*, taking at least *one* from each Unit :

3×5=15

UNIT—I

1. Anatomy of dicot leaf
2. Classification of tissues

UNIT—II

3. Anatomical adaptations in hydrophytes
4. Cambium activity

UNIT—III

5. Structure of mature ovule in *Gnetum*
6. Morphology of *Cycas*

UNIT—IV

7. Economic importance of gymnosperms
8. Distribution of living gymnosperms in India

( SECTION : C—DESCRIPTIVE )

( Marks : 50 )

Answer five questions, taking at least one from each Unit :

10×5=50

UNIT—I

1. Describe the different tissue systems in plants. Explain with suitable diagrams. 10
2. With an illustrated diagram, explain the anatomy of leaf. Differentiate between dorsiventral and isobilateral leaves. 7+3=10

UNIT—II

3. Describe the anomalous secondary growth in *Bignonia* stem with neat labelled diagram. 10
4. Write short notes on the following : 5+5=10
  - (a) Anomalous secondary growth in *Dracaena*
  - (b) Secondary growth in stem

UNIT—III

5. With suitable diagrams, describe the morphology and reproduction in *Pinus*. 10
6. Write short notes on the following : 5+5=10
  - (a) Morphology and reproduction of *Gnetum*
  - (b) Classification of gymnosperms

UNIT—IV

7. Describe the structure and evolution of the ovule in gymnosperms, highlighting key evolutionary adaptations. 10
8. Analyze the phylogenetic trends observed in gymnosperms, discussing their evolutionary relationships and diversification. 10

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