2025

(NEP—2020)

(4th Semester)

BOTANY (MAJOR/MINOR)

(Bryophytes and Pteridophytes)

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. What is a defining characteristic of bryophytes?

(a) Presence of vascular tissues ( )

(b) Dominant sporophyte generation ( )

(c) Lack of true roots, stems and leaves ( )

(d) Seed production ( )

2. What structure in *Marchantia* bears the antheridia?

(a) Gemma cups ( )

(b) Archegoniophore ( )

(c) Antheridiophore ( )

(d) Rhizoids ( )

3. What is an ecological importance of bryophytes?

(a) Production of timber ( )

(b) Soil formation and erosion control ( )

(c) Oxygen production via photosynthesis only ( )

(d) Seed dispersal ( )

4. The evolution of sporophytes in bryophytes shows a trend toward

(a) reduction in size ( )

(b) increased independence from the gametophyte ( )

(c) loss of spore production ( )

(d) complete dependence on the gametophyte ( )

5. Liverworts differ from mosses by

(a) having a dominant sporophyte ( )

(b) typically lacking a leafy structure ( )

(c) producing seeds ( )

(d) having vascular tissues ( )

6. In *Riccia*, reproduction primarily occurs via

(a) spores only ( )

(b) gemmae and spores ( )

(c) fragmentation only ( )

(d) seeds ( )

7. Pteridophytes are distinguished from bryophytes by

(a) lack of spores ( )

(b) presence of vascular tissues ( )

(c) dominant gametophyte phase ( )

(d) seed production ( )

8. *Selaginella* exhibits which unique reproductive feature?

(a) Homospory ( )

(b) Heterospory ( )

(c) Seed production ( )

(d) Asexual budding ( )

9. Which type of stele is characterized by a central pith surrounded by xylem and phloem?

(a) Protostele ( )

(b) Siphonostele ( )

(c) Dictyostele ( )

(d) Eustele ( )

10. Heterospory is a condition necessary for

(a) vegetative reproduction ( )

(b) evolution of the seed habit ( )

(c) homospory ( )

(d) asexual spore production ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

Answer *five* questions, taking at least *one* from each Unit : 3×5=15

UNIT—I

(Bryophytes)

1. Write notes on gemma and gemma cup.

2. Write a note on thallus organization in *Marchantia*.

UNIT—II

(Evolution of Sporophytes)

3. What are the general characteristics of hornworts?

4. How does *Polytrichum* reproduce?

UNIT—III

(Pteridophytes)

5. How does *Pteris* reproduce?

6. What are the key characteristic features of pteridophytes?

UNIT—IV

(Steles and Economic Importance)

7. What are the different types of steles found in pteridophytes?

8. What is the Telome theory?

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer *five* of the following, taking at least *one* from each Unit : 10×5=50

UNIT—I

(Bryophytes)

1. Give an account on the general characteristics of bryophytes. Classify bryophytes according to Smith's system up to class.

2. Explain the life cycle of—

(a) *Marchantia* with a labelled diagram ;

(b) *Funaria* with a labelled diagram.

UNIT—II

(Evolution of Sporophytes)

3. Discuss the evolutionary significance of sporophytes in bryophytes.

4. Compare the characteristics of liverworts, hornworts and mosses.

UNIT—III

(Pteridophytes)

5. What are pteridophytes? Write an account on the classification of pteridophytes according to Smith's system. 2+8=10

6. Explain the morphology, reproduction and life cycle of *Selaginella*.

UNIT—IV

(Steles and Economic Importance)

7. Discuss the concept of heterospory and its role in the evolution of the seed habit.

8. Write notes on the distribution and characteristics of *Adiantum* and *Azolla*.

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