

- (b) Explain the effects of heavy metals on plants and their tolerance mechanisms. 5

7. Write short notes any *two* of the following : 15

- (a) The interaction between nitric oxide and reactive oxygen species in signaling pathways.
- (b) The role of circadian rhythms in plant growth and flowering.
- (c) The physiological and biochemical responses of plants to herbivore attack.



Roll No. ....

Total Pages : 04

756202

May 2026

M. Sc. (Botany) (Second Semester)  
PLANT PHYSIOLOGY (BOP-104-V)

Time : 3 Hours]

[Maximum Marks : 75

**Note :** It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

**Part A**

1. (a) Write a short note on the importance of plant physiology in agriculture. 1.5
- (b) What is the role of the Casparian strip in transport ? 1.5
- (c) What is the function of proton pumps ( $H^+$ -ATPase) in plants ? 1.5

- (d) Why is flowering considered a multi-organ function ? 1.5
- (e) Mention two differences between etiolated seedlings and light-grown seedlings. 1.5
- (f) Name two hormones involved in plant stress responses. 1.5
- (g) Name two techniques used for quantification of plant hormones. 1.5
- (h) What is leaf and flower senescence ? 1.5
- (i) What are markers of nitrosative stress ? 1.5
- (j) What is the effect of light intensity on photosynthesis ? 1.5

### Part B

2. (a) Explain the C4 pathway of photosynthesis with advantages over C3 plants. 10
- (b) Describe the strategies used by plants for iron uptake and transport. 5

3. (a) Explain the structure, function and signaling mechanism of cryptochromes. 5
- (b) Describe the types, functions and ecological importance of plant secondary metabolites. 10
4. Write short notes any *two* on the following : 15
- (a) Allelopathy and mechanism of allelopathic inhibition in neighboring plants.
- (b) Structure and function of Photosystem I and Photosystem II.
- (c) Synthetic plant growth regulators and their agricultural applications.
5. (a) Explain the different reproductive strategies in higher plants and their significance. 5
- (b) Discuss the process of floral induction, evocation and floral development. 10
6. (a) Discuss the environmental, genetic and molecular regulation of senescence. 10