D 51227 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2023

(CBCSS)

Botany

BOT 3C 07—PLANT PHYSIOLOGY, METABOLISM AND BIOCHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A (Short Answer Type Questions)

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. What is the significance of lipids in cellular membranes and their role in membrane fluidity ?
2. How does osmosis play a role in water movement across a plant cell membrane ?
3. How does capillary action contribute to the ascent of water in xylem vessels ?
4. How do leguminous plants establish a symbiotic relationship with nitrogen-fixing bacteria, and why is this relationship important for agriculture ?
5. How do plants assimilate nitrogen, and why is the assimilation of nitrate important for their growth ?
6. What is the role of photoreceptors in photosynthesis ?
7. What is root pressure ?

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. Briefly explain the role of stomatal movement in regulating water loss and gas exchange in plants.
9. Describe the covalent structure of proteins. What is the significance of primary structure in protein function ?
10. What is the Z-scheme, and how does it illustrate the flow of electrons during photosynthesis ?

Turn over

11. Discuss the regulation of oxidative phosphorylation and the role of ATP synthesis.

12. Discuss the roles of hormones in plant growth and development.

13. Give the examples of essential nutrients and their roles in plant physiology.

14. Define secondary metabolites and explain their physiological roles in plants

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Compare the photosynthetic carbon reduction cycle in C3, C4, and CAM plants.

16. Describe the activation and entry of fatty acids into metabolic pathways. How does beta-oxidation occur in both saturated and unsaturated fatty acids ?

17. Explain the physiological processes involved in seed germination. How do hormones play a crucial role in the initiation of germination ?

18. Describe the process of gluconeogenesis and its significance in maintaining blood glucose levels. How is gluconeogenesis regulated ?

(2 × 5 = 10 weightage)