D 131957 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2025

(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. How do enzymes lower the activation energy of reactions ?
2. What is water potential ? Briefly explain its components.
3. What mechanisms allow fixed nitrogen to be exported from root nodules in leguminous plants and transported to other plant tissues ?
4. Differentiate between anabolism and catabolism in metabolic pathways. Give examples of each.
5. What is the absorption spectrum of chlorophyll, and why is it important in photosynthesis ?
6. What are the various types of cells involved in phloem transport, and what roles do they play in the process ?
7. What is the role of abscisic acid (ABA) in seed dormancy and drought response ?

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

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

8. Give specific examples of how auxins, gibberellins, cytokinins and ethylene influence plant growth and development
9. Briefly explain the three-dimensional structure of proteins.

Turn over

10. Explain how nutrient deficiencies in plants produce growth abnormalities and impact crop productivity.

11. Describe the role of phytochrome in photoperiodism, including its involvement in the induction of flowering.

12. Describe the process of photosynthetic electron transport and how it leads to photophosphorylation.

13. Discuss the molecular responses of plants to water stress and their adaptive strategies for water conservation.

14. How do C4 plants and CAM plants optimize carbon fixation in different environments ? Give examples of plants that use these strategies.

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

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

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

16. Define secondary metabolites and briefly explain their physiological roles in plants.

17. Explain how salt stress affects ion balance, osmotic regulation, and overall plant physiology.

18. Describe the genetic control of plant development. How do genes and regulatory elements influence the development of different plant structures and functions ?

(2 × 5 = 10 weightage)