D 150262 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. (CBCSS) [REGULAR/SUPPLEMENTARY] DEGREE EXAMINATION, NOVEMBER 2026

Botany

BOT3C07—PLANT PHYSIOLOGY, METABOLISM AND BIOCHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A (Short Answer Type Questions)

Answer any **four** *questions.*

1. Differentiate between cohesion and adhesion. Give one biological significance of each.
2. What is transpiration ? Mention any *two* factors affecting transpiration.
3. Distinguish between primary and secondary structures of proteins.
4. What are absorption and action spectra ? How do they differ ?
5. What are membrane lipids ? Give examples.
6. What are allosteric enzymes ? How do they differ from covalently regulated enzymes?
7. What are secondary metabolites? Mention two important physiological roles.

(4 × 2 = 8 weightage)

Section B (Short Essay Type Questions)

Answer any **four** *questions.*

8. Describe the uptake of mineral ions by plant roots, with reference to passive and active absorption.
9. Describe nitrate assimilation in plants. Mention the roles of nitrate reductase and nitrite reductase.
10. Explain the significance of the C4 pathway under high temperature and low CO_2 conditions.

Turn over

11. Describe the pressure-flow hypothesis for phloem translocation.

12. Explain the roles of abscisic acid and ethylene in plant development.

13. Describe the structure and physiological significance of phytochrome.

14. Explain how salinity stress affects water relations, ion balance and growth of plants.

(4 × 3 = 12 weightage)

Section C (Long Essay Type Questions)

Answer any **two** *questions.*

15. Explain the properties of water that are important for plant life. Discuss water potential and the movement of water through the soil-plant-atmosphere continuum.

16. Discuss biological nitrogen fixation in leguminous plants, with reference to symbiosis, nitrogenase activity, energy requirement and nitrogen assimilation.

17. Explain the citric acid cycle. Discuss its amphibolic nature, anaplerotic reactions and major regulatory points.

18. Describe oxidative phosphorylation in mitochondria, highlighting the electron transport chain, electron carriers and ATP synthesis.

(2 × 5 = 10 weightage)