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FOURTH SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)  
EXAMINATION, APRIL, 2024

(CBCSS)

Botany

BOT 4E 01 B—PLANT TISSUE CULTURE  
(2019 Admission onwards)

Time : Three Hours

Maximum : 20 Weightage

**Section A (Short Answer Type Questions)**

Answer any **four** questions.

Each question carries 2 weightage.

1. What is in-process quality control?
2. What is photoautotrophic micropropagation?
3. Name the valuable compounds produced using tissue culture.
4. How can effective marketing promote tissue culture plant adoption?
5. Can you explain the mechanisms underlying somaclonal variation in plants at the cellular and genetic levels?
6. What is the significance of embryo culture in plant propagation?
7. How is somatic embryogenesis utilized in plant biotechnology for genetic transformation and the production of transgenic plants with desirable traits?

(4 × 2 = 8 weightage)

**Section B (Short Essay Type Questions)**

Answer any **four** questions.

Each question carries 3 weightage.

1. How does knowledge transfer from the laboratory to the field enhance farmer acceptance of tissue culture plants?
2. How does temperature adjustment play a role in the hardening process, and what temperature ranges are typically used for successful acclimation?

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10. How does bioreactor technology contribute to plant micropropagation in tissue culture? Discuss the advantages and limitations of this approach.
11. Explain the objectives of secondary metabolite production using tissue culture techniques. Give examples.
12. Describe the certification process for tissue culture plants and the organizational responsibilities for certification.
13. Describe the techniques and significances of protoplast culture.
14. What are the challenges faced by tissue culture ventures in India and abroad, and how are they addressing these challenges to further enhance their contributions to the agriculture and horticulture industries?

(4 × 3 = 12 marks)

### Section C (Long Essay Type Questions)

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

15. Compare and contrast different types of culture media used in plant tissue culture, emphasizing their compositions and applications.
16. What is Phytomorphogenesis? Explain the role of hormones in phytomorphogenesis in relation to their mode of action and synergistic effects.
17. Can you explain the differences between serological and molecular techniques used in virus detection of tissue cultured plants?
18. Discuss the value addition in tissue culture plants through the inoculation of VAM and endophytes, and explain how this enhances plant performance.

(2 × 5 = 10 weightage)