

M. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2026**SEMESTER 4 : BOTANY****COURSE : 24P4BOTT15 : PLANT TISSUE CULTURE***(For Regular 2024 Admission)*

Time : Three Hours

Max. Weights: 30

PART A**Answer any 8 questions****Weight: 1**

1. What are the important functions of Pluronic F-68 in plant tissue culture media? (U, CO 1)
2. What is polysomaty? How does it contribute to somaclonal variation? (U, CO 2)
3. What are the important functions of gibberellins in plant tissue culture media? (U, CO 1)
4. Define habituated callus culture. (U, CO 3)
5. How is the slow-cooling method practiced in cryopreservation? (U, CO 6)
6. Discuss the advantages of cryotherapy over conventional methods for virus elimination in meristem culture. (U, CO 4)
7. Give an example of enhanced secondary metabolite production using elicitors. (U, CO 5)
8. What is the purpose of using antioxidants in plant tissue culture media? Give one example of an antioxidant used in the culture medium. (U, CO 1)
9. What is the significance of star-like morphology in uninucleate pollen? (U, CO 2)
10. Give an example of enhanced secondary metabolite production by modifying culture conditions. (U, CO 5)

(1 x 8 = 8)**PART B****Answer any 6 questions****Weights: 2**

11. Explain any three strategies employed to optimize phytochemical production under in vitro conditions. (U, CO 5)
12. What are the different types of pre-existing variability in somaclonal variation? (U, CO 2)
13. What are the various inorganic nutrients used in plant tissue culture media? (U, CO 1)
14. What are the molecular mechanisms underlying somaclonal variation? (U, CO 2)
15. Discuss the major advantages of pollen culture over anther culture. (U, CO 2)
16. Explain the protoplast culture techniques. (U, CO 4)
17. Prepare a flowchart showing the preparation of culture medium from stock solutions. (U, CO 1)
18. Illustrate, with a flowchart, the sequential steps involved in vitro hairy root formation. (U, CO 5)

(2 x 6 = 12)**PART C****Answer any 2 questions****Weights: 5**

19. Explain somatic embryogenesis. What are the factors affecting somatic embryogenesis? Describe the developmental process of somatic embryogenesis. (U, CO 3)

20. How is the long-term storage of germplasm performed? Explain the steps involved. Describe the advantages and applications of in vitro technology for germplasm conservation. (U, CO 6)
21. Explain the procedure, requirements, and applications of embryo culture. (U, CO 4)
22. What is gynogenesis? What are the important factors affecting gynogenesis? (U, CO 2)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Explain the role of plant growth regulators in tissue culture medium	A	1, 3, 8, 13, 17	7
CO 2	Apply the principles of plant tissue culture for the production of ploidy variants and somaclonal variants	A	2, 9, 12, 14, 15, 22	13
CO 3	Describe organogenesis and somatic embryogenesis	U	4, 19	6
CO 4	Identify various in vitro culture techniques	A	6, 16, 21	8
CO 5	Modify the secondary metabolite production by in vitro techniques	A	7, 10, 11, 18	6
CO 6	Explain the in vitro conservation strategies	A	5, 20	6

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;