Reg. No ..... Name **25P4033**

MSc DEGREE END SEMESTER EXAMINATION- MARCH 2025

SEMESTER 4 : BOTANY

COURSE : **21P4BOTT15 : TISSUE CULTURE AND MICROBIAL BIOTECHNOLOGY**

(For Regular - 2023 Admission and Supplementary 2022/2021 Admissions)

Duration : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	What do you mean by *in vitro* induced variations?	(U, CO 1, CO 3, CO 6)
2.	Briefly describe Thawing.	(U, CO 1, CO 5)
3.	What are Cybrids?	(U, CO 1, CO 3)
4.	Explain the tissue culture method for the production of pathogen free plants.	(U, CO 1, CO 3)
5.	What are the applications of callus culture?	(U, CO 1, CO 3)
6.	Write a short note on stem cells.	(U, CO 2)
7.	Write the principle of enzyme engineering.	(U, CO 4)
8.	Discuss the methods in tissue engineering.	(U)
9.	What are the applications of suspension culture?	(U, CO 1, CO 3)
10.	Discuss the factors influencing vascular differentiation in callus.	(A)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	Describe the ionic adsorption method of enzyme immobilization with its merits and demerits.	(U, CO 2)
12.	Briefly explain the advantages, disadvantages and applications of somaclonal variation.	(U, CO 1, CO 3, CO 6)
13.	What is Cryopreservation? Explain.	(R, CO 1, CO 5)
14.	What is somatic embryogenesis? Briefly explain the steps involved.	(U, CO 1, CO 3)
15.	Explain about embryonic and adult stem cells.	(U, CO 2)
16.	'Enhanced axillary branching is one of the most important approaches used for in vitro multiplication'. Explain.	(U, CO 1, CO 3)
17.	Discuss the entrapment of enzymes. Give its merits and demerits.	(U, CO 2)
18.	Briefly explain the *in vivo* hairy root formation.	(U, CO 1, CO 3)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19.	Define tissue culture and its basic principles. Briefly explain history and important milestones in plant tissue culture.	(U, CO 1, CO 3)
20.	Explain organogenesis. What are the factors affecting shoot-bud differentiation?	(U, CO 1, CO 3)
21.	What is endosperm culture? What are the factors affecting endosperm culture? Give an account of its applications and limitations.	(U, CO 1, CO 3, CO 6)
22.	Explain the steps involved in protoplast culture.	(R, CO 1, CO 3)

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Examine the basic aspects of plant tissue culture.	A	1, 2, 3, 4, 5, 9, 12, 13, 14, 16, 18, 19, 20, 21, 22	36
CO 2	Describe the fundamentals of microbial biotechnology.	U	6, 11, 15, 17	7
CO 3	Evaluate the different methods and processes involved in plant tissue culture.	E	1, 3, 4, 5, 9, 12, 14, 16, 18, 19, 20, 21, 22	33
CO 4	Describe the scope and relevance of Bioreactors and fermentation technology.	U	7	1
CO 5	Describe the in vitro germplasm conservation strategies.	U	2, 13	3
CO 6	Analyze the somaclonal and ploidy variants.	An	1, 12, 21	8

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