Reg. No ..... Name **24P4031**

M.Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2024

SEMESTER 4 : BOTANY

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

(For Regular 2022 Admission and Supplementary 2021 Admission)

Duration : Three Hours Max. Weights: 30

PART A

Answer any 8 questions **Weight: 1**

1.	Write the principle of enzyme engineering.	(U, CO 4)
2.	What is Cryoprotection? Give an example for a Cryoprotectant.	(U, CO 1, CO 5)
3.	What are the applications of suspension culture?	(U, CO 1, CO 3)
4.	What are the applications of node culture?	(U, CO 1, CO 3)
5.	Write the applications of tissue engineering.	(U, CO 2)
6.	What are the most useful modifications made in the growth medium to promote secondary metabolite production?	(R, CO 1, CO 3)
7.	How does the relative concentration of Auxin and Cytokinin affect the morphogenesis of culture systems?	(R, CO 1, CO 3)
8.	What is organogenesis?	(U, CO 1, CO 3)
9.	What is Androgenesis?	(U, CO 1, CO 3, CO 6)
10.	Write the applications of embryogenic stem cells.	(U)

(1 x 8 = 8)

PART B

Answer any 6 questions **Weights: 2**

11.	Discuss the entrapment of enzymes. Give its merits and demerits.	(U, CO 2)
12.	What are the different methods for the selection of high yielding lines for secondary metabolite production?	(U, CO 1, CO 3)
13.	Briefly discuss the technologies used in regenerative medicine.	(U, CO 2)
14.	What is Cryopreservation? Explain.	(R, CO 1, CO 5)
15.	What are the factors affecting shoot-bud differentiation?	(U, CO 1, CO 3)
16.	Explain the different methods of cell immobilization.	(A, CO 2)
17.	What are the factors affecting endosperm culture?	(R, CO 1, CO 3, CO 6)
18.	What is callus and how it can be induced by *in vitro* techniques?	(U, CO 1, CO 3)

(2 x 6 = 12)

PART C

Answer any 2 questions **Weights: 5**

19.	Explain somatic embryogenesis. What are the factors affecting somatic embryogenesis?	(U, CO 1, CO 3)
20.	Explain the procedure and applications of hairy root culture.	(U, CO 1, CO 3)
21.	Explain the general composition of plant tissue culture medium.	(U, CO 1, CO 3)
22.	What is Gynogenesis? What are the factors affecting Gynogenesis? Give an account of its applications and limitations.	(R, CO 1, CO 3, CO 6)

(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	2, 3, 4, 6, 7, 8, 9, 12, 14, 15, 17, 18, 19, 20, 21, 22	37
CO 2	Describe the fundamentals of microbial biotechnology.	U	5, 11, 13, 16	7
CO 3	Evaluate the different methods and processes involved in plant tissue culture.	E	3, 4, 6, 7, 8, 9, 12, 15, 17, 18, 19, 20, 21, 22	34
CO 4	Describe the scope and relevance of Bioreactors and fermentation technology.	U	1	1
CO 5	Describe the in vitro germplasm conservation strategies.	U	2, 14	3
CO 6	Analyze the somaclonal and ploidy variants.	An	9, 17, 22	8

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