

M. Sc DEGREE END SEMESTER EXAMINATION - APRIL 2021**SEMESTER 4 : BOTANY****COURSE : 16P4BOTT15 : TISSUE CULTURE AND MICROBIAL BIOTECHNOLOGY***(For Regular - 2019 Admission and Supplementary - 2018/2017/2016 Admissions)*

Time : Three Hours

Max. Marks: 75

PART A**Answer any 8 (2 marks each)**

1. What is HEPA? What is its function?
2. Differentiate between chemically defined and chemically undefined media.
3. Differentiate between caulogenesis and rhizogenesis.
4. Discuss the reasons of somaclonal variation.
5. Write a short note on the advantages of endosperm culture.
6. Describe the principles of protoplast culture.
7. What is process development?
8. What is regenerative medicine?
9. What are the applications of enzyme immobilization?
10. What are the limitations of conventional method of germplasm conservation through seeds?
11. How nature of plant material is significant in cryopreservation?
12. What are primary and secondary plant metabolites?

(2 x 8 = 16)**PART B****Answer any 7 (5 marks each)**

13. Explain various steps of plant regeneration via somatic embryogenesis.
14. Cell division is not required for xylem differentiation. Comment on the statement with some evidences.
15. How do we select somaclones at plant level? Give examples.
16. Briefly explain how anther and pollen culture be used for plant breeding and crop improvement.
17. Explain chemical fusion method of protoplast fusion.
18. What are the methods used for tissue engineering?
19. Give an account on use of gene modification for enzyme engineering.
20. Write a short note on *in vitro* plant germplasm conservation.
21. What are the potential advantages of *in vitro* conservation of plant germplasm?
22. What are the advantages of hairy root culture?

(5 x 7 = 35)**PART C****Answer any 2 (12 marks each)**

23. Write an essay on various factors affecting somatic embryogenesis.

OR

24. Describe the method and discuss the importance and implication of pollen culture.

25. Give an account of the use of microbial technology for the production of enzymes.

OR

26. Write an essay on various methods for enhancement of secondary metabolite production using tissue culture methods.

(12 x 2 = 24)