

Reg. No.....Name.....**P407**

**MSc DEGREE END SEMESTER EXAMINATION MARCH 2016**  
**SEMESTER - 4 BOTANY**

COURSE: P4BOTT13EL, TISSUE CULTURE AND MICROBIAL BIOTECHNOLOGY

Time: Three Hours

Max. Marks: 75

**PART-A**

I. Answer **any eight** questions briefly; each question carries 2 marks

1. What are cybrids?
2. Write notes on synthetic seeds.
3. What is the importance of *Agrobacterium rhizogenes*?
4. How haploid plants are diploidised?
5. What is a cryoprotectant?
6. What is downstream processing?
7. What is pre-existing variability?
8. How triploid plants are produced through tissue culture method?
9. What is vitrification?
10. What is enzyme engineering?
11. What are biosensors?
12. What is bubble column bioreactor? (8 x 2 = 16)

**PART-B**

II. Answer **any seven** questions; each question carries 5 marks

13. What are the factors influencing adventitious shoot regeneration?
14. Write a note on protoplast fusion.
15. What is the molecular basis of somaclonal variation?
16. Describe stem cell technology and its applications.
17. What are plant secondary metabolites? How it is produced through culture techniques?
18. Describe the protocol for microspore culture.
19. Write an account on enzyme immobilization.
20. Briefly write the protocol for cryopreservation.
21. Describe various biodegradation methods.
22. Write a note on commercial production of enzymes. (5 x 7 = 35)

**PART-C**

III. Answer **any two** questions; each question carries 12 marks

23. What are somatic embryos? How it is different from zygotic embryos? Describe the various stages of somatic embryo development.
24. Describe the importance and advantages of bioremediation.
25. Write an account on various types of fermentation process.
26. Write an essay on *in vitro* gynogenesis. (12 x 2 = 24)