Reg. No ..... Name **19P4032**

MSc DEGREE END SEMESTER EXAMINATION - MARCH/APRIL 2019

SEMESTER 4 : BOTANY

COURSE : **16P4BOTT15: TISSUE CULTURE AND MICROBIAL BIOTECHNOLOGY**

(For Regular - 2017 Admission and Supplementary - 2016 Admission)

Time : Three Hours Max. Marks: 75

Section A

Answer any 8 (2 marks each)

1. What is meant by liquid medium? How will you make it solid?
2. What is pigmented callus tissue?
3. What is incubation?
4. How does cytokinin affect cytodifferentiation?
5. Comment on the role of *in-vitro* induced variability in effecting somaclonal variation.
6. How does explant affect *in vitro* gynogenesis?
7. What is droplet culture method of protoplast?
8. Differentiate between stirred tank and airlift bioreactors.
9. What is regenerative medicine?
10. Explain slow cooling and rapid cooling methods of freezing.
11. Write a short note on plant secondary metabolites.
12. What is meant by elicitation?

(2 x 8 = 16)

Section B

Answer any 7 (5 marks each)

13. What is meant by encapsulation of somatic embryos? How is it done?
14. Cell division is not required for xylem differentiation. Comment on the statement with some evidences.
15. Discuss the molecular basis of somaclonal variation.
16. What are the key factors that affect gynogenesis?
17. Why plasmolyticums or osmolyticums are used essentially for protoplast isolation and culture?
18. What are the non-therapeutic applications of stem cell research?
19. Give an account on use of gene modification for enzyme engineering.
20. What is the significance of short or medium-term storage over cryopreservation?
21. How culture conditions influence the production of secondary metabolites?
22. What are the advantages of hairy root culture?

(5 x 7 = 35)

Section C

Answer any 2 (12 marks each)

23. What is somatic embryogenesis? Discuss the principle of somatic embryogenesis. Add a note on the 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. What are the methods involved in *in situ* and *ex situ* conservation of germplasm? Critically evaluate the role of *in vitro* germplasm conservation.

(12 x 2 = 24)