Reg. No ..... Name ..... **21P4007**

**M. Sc DEGREE END SEMESTER EXAMINATION - APRIL 2021**

**SEMESTER 4 : BOTANY**

COURSE : **16P4BOTT13 : BIOTECHNOLOGY AND GENETIC ENGINEERING**

*(For Regular - 2019 Admission & Supplementary - 2018/2017/2016 Admissions)*

Time : Three Hours Max. Marks: 75

**PART A**

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

1. What is CTAB?
2. What is HAC?
3. What are competent cells? How can you induce competence?
4. What is binary vector system?
5. What is a nucleotide probe?
6. What are the limitations of natural inducible expression systems?
7. Define bioterrorism.
8. What is meant by site directed mutagenesis?
9. Explain immobilized cell biosensors.
10. What is immunological screening?
11. Explain RIA.
12. What is the use of GM animals in disease studies?

**(2 x 8 = 16)**

**PART B**

**Answer any 7 (5 marks each)**

13. Explain the methods to create sticky ends in blunt ended fragments.
14. Explain the role of GFP as a reporter system.
15. With the help of diagrams, explain cointegrate vector system.
16. What is phosphoramidite nucleotide? Explain its structure with a diagram.
17. Briefly explain the principle, procedure and applications of RNAi
18. Critically evaluate the impact of GMOs on the ecosystem.
19. Describe the applications of protein engineering.
20. What are the applications of biosensors in industries?
21. Explain the procedure and applications of chromosome walking.
22. Explain *ex-vivo* and *in-vivo* gene therapy approaches.

**(5 x 7 = 35)**

**PART C**

**Answer any 2 (12 marks each)**

23. What are the steps involved and applications of cloning? Differentiate between topocloning and gateway cloning.

OR

24. Explain naturally occurring and recombinant inducible expression systems with suitable examples.

25. Give an account on procedure and applications of ELISA. Mention the different types of ELISA.

OR

26. Write an essay on the problems and prospects of genetically modified crops.

**(12 x 2 = 24)**