

Total number of printed pages: 03 Programme: PG

Semester: 1st

Paper Code: PFET103

2022

**SUBJECT NAME: RECENT ADVANCES IN ENZYME AND
MICROBIAL TECHNOLOGY**

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

1. a) Write a brief note on preservation and maintenance protocol of microbes. 5
- b) How can you enumerate the microbial population in a food sample? 5
- c) Define surface culture and submerged culture fermentation. Give one example each of these fermentations. 4
- d) How crude enzyme can be prepared by submerged culture fermentation? 6
2. a) What is mutation? 2
- b) Discuss about different types of mutation. 6
- c) Give few examples of stop codon. 2
- d) Describe R-DNA technology with suitable diagram and applications. 8
- e) What is koji? 2
3. a) Explain any efficient protein characterization technique. 5
- b) Briefly describe proteomics. 5
- c) Mention two natural and two synthetic support materials for immobilization of an enzyme. 2+2=4
- d) Describe the different modes of enzyme immobilization techniques. 6
4. a) Explain the kinetic property of a matrix material in enzyme immobilization? 3
- b) Cite two potential industrial applications of immobilized enzyme technology with the involvement of biochemical reaction. 4
- c) State the possible causes of restriction of immobilized enzyme technology. 3
- d) Explain CLEA technology with suitable example. 4
- e) Describe one suitable whole cell immobilization technique with potential applications. 6
5. a) Explain biomass and biomass constituents. 4

- b) Discuss the bioethanol production by using any suitable method. 6
- c) What do you understand by biofuel? 2
- d) What is meant by biogas? 2
- e) Describe the mechanism of formation of biogas through anaerobic digestion process. 6
6. a) Define antibiotic. How antibiotic is ingested in the body? 2+2=4
- b) Discuss the mechanism of action of antibiotics against human pathogens. 6
- c) Mention the structure of Pen-G. Compare Pen-G with semisynthetic penicillin. 2+2=4
- d) Give the action of acid and alkali on Pen-G. 2+2=4
- e) Cite one example of semisynthetic penicillin with its synthesis reaction. 2
7. a) Explain the fermentative production and purification strategy of penicillin. 4+4=8
- b) What is 10^5 unit of penicillin? 2
- c) Explain the chemical structure, synthesis, isolation, recovery and application of a microbial polysaccharide with suitable example. 6
- d) Explain mycotoxin and aflatoxin? Cite few examples of mycotoxins with characteristic properties. 2+2=4

