Total number of printed pages: 02

PG/1st Semester/ PFET103

2023

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 two important techniques of preservation and maintenance protocol of microbes.	4
	b)	How can you enumerate the microbial population in a food sample?	5
	c)	Describe one advanced identification technique of microorganism. What is solid state fermentation? Give one example of this.	3+1+1
	d)	How α-amylase can be prepared by submerged culture fermentation?	6
2.	a)	Differentiate between nucleotide and nucleoside.	2
	b)	Explain briefly with schematic diagram the inducible and repressible enzyme synthesis and control mechanism.	6
	c)	Give two examples of stop codon.	2
	d)	Describe R-DNA technology with suitable diagram and applications.	8
	e)	What is koji? Give one therapeutic application of enzyme.	1+1
3.	a)	Explain any efficient protein characterization technique.	4
	b)	Explain any efficient protein purification technique. Cite an example of role of biocatalyst in organic compound synthesis.	4+2
	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) Define biomass and explain biomass constituents. 1+3

b) How biomass can be converted to biofuels. 2

c) What is meant by biogas? 1

d) Describe the mechanism of formation of biogas through anaerobic digestion process with empirical equation of biogas formation. 5+2

e) Discuss the role of various factors affecting biomethanation 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. Why Pen-G is not active against gram negative bacteria? 2+2=4

d) Give the action of sodium hydroxide and mineral acid on Pen-G. 2+2=4

e) Cite one example of semisynthetic penicillin. Give the name of the major precursor of it. 2

7. a) What are the selection criteria of penicillin producing organisms? Give the fermentation conditions and media composition for fermentative production of penicillin. How it is recovered? 2+2+4=8

b) What is 5 lac unit of penicillin? 2

c) Explain the chemical structure, synthesis, isolation, recovery and application of a microbial polysaccharide with suitable example. 5

d) Differentiate between mycotoxin and aflatoxin. Cite few examples of mycotoxins with characteristic properties. 2+3=5

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