

**M. SC. (BIOCHEMISTRY)
(MSCBCH)**

Term-End Examination

June, 2025

**MBC-004 : ENZYMES AND THEIR
APPLICATIONS**

Time : 3 Hours

Maximum Marks : 100

Note : Answer any *five* questions. All questions carry equal marks.

1. (a) Explain the thermodynamics of enzyme catalyzed reaction. 10
(b) Write short notes on the following :
$$4 \times 2\frac{1}{2} = 10$$
 - (i) Conjugate enzyme
 - (ii) Prosthetic group
 - (iii) EC number of enzyme
 - (iv) Lyases
2. (a) Discuss the Fischer's lock and key hypothesis. List its limitations and explain Induced-fit model of enzyme catalysis. 10

- (b) Give an overview of acid-base catalysis of enzymes. 10
3. (a) Derive Michaelis-Menten equation and draw its plot. 12
- (b) Derive Lineweaver-Burk equation and draw double reciprocal plot. 8
4. (a) Draw primary plots and explain their usage for differentiating bisubstrate mechanisms. 8
- (b) Distinguish between the following :
3×4=12
- (i) Competitive and Non-competitive enzyme inhibition
- (ii) Reversible and Irreversible enzyme inhibition
- (iii) Stopped and Continuous flow techniques
5. (a) How does compartmentation help to control metabolic pathways ? Give examples. 8

[3]

- (b) What are allosteric enzymes ? Give examples. Explain Hill equation and its coefficient. 12
6. Write notes on the following : 10+10
- (a) Nomenclature of Isozymes with examples.
- (b) Fatty Acyl Synthase Multienzyme complex
7. Explain the methods of enzyme purification based on the following parameters : 10+10=20
- (a) Size or mass
- (b) Polarity
8. (a) Describe the applications of enzymes in the following (any *two*) : 5+5
- (i) Diagnostics
- (ii) Agriculture
- (iii) Fruit and Wine industry
- (b) Explain the binding methods of enzyme immobilization. 10

x x x x x

D-3274/MBC-004