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MBC-004

M. SC. (BIOCHEMISTRY) (MSCBCH)

Term-End Examination

June, 2026

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

Time : 3 Hours

Maximum Marks : 100

Note : (i) Attempt any *five* questions.

(ii) All questions carry equal marks.

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1. (a) Describe IUBMB system of enzyme classification. Why systematic names of enzymes are retained in spite of trivial names ? 10
 - (b) Differentiate between the following : 5+5
 - (i) Direct and coupled enzyme assays
 - (ii) Continuous and discontinuous assays

2. (a) Explain the effect of pH and substrate concentration on enzyme activity. 10
- (b) Discuss acid-base mechanism of enzyme catalysis. 10
3. (a) Enlist advantages and disadvantages of the following for studying enzyme kinetics : 5+5
- (i) Stopped flow techniques
- (ii) Continuous flow techniques
- (b) Define the following terms and give their significance : $3\frac{1}{2}+3\frac{1}{2}+3$
- (i) K_m
- (ii) V_{max}
- (iii) K_{cat}
4. (a) Derive Michaelis-Menten equation for competitive inhibition. 10
- (b) Write notes on the following : 5+5
- (i) Rapid reaction studies for bisubstrate enzyme reactions.
- (ii) Lactate dehydrogenase isozymes.

5. (a) What are allosteric enzymes ?
Distinguish between MWC & KNF model. 10
- (b) Describe phylogenetic distribution of multi-enzyme proteins and their properties. 10
6. (a) Explain the factors influencing choice of starting material for enzyme purification. 10
- (b) Discuss enzyme purification methods based on size or mass. 10
7. Describe applications of enzymes in the following : $4 \times 5 = 20$
- (a) Diagnostics
 - (b) Agriculture industry
 - (c) Fruit juice industry
 - (d) Food industry
8. (a) Give an overview of properties of immobilized enzymes. 10

(b) Write note on any *two* of the following :

5+5

- (i) Hybrid enzymes
- (ii) Gel entrapment method of immobilization
- (iii) Artificial enzymes

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