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MBC–004

M. SC. (BIOCHEMISTRY)
(MSCBCH)

Term-End Examination

December, 2024

MBC–004 : ENZYMES AND THEIR APPLICATIONS

Time : 3 Hours

Maximum Marks : 100

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

(ii) All questions carry equal marks.

1. (a) Explain *two* key characteristic properties of an enzyme. What is its active site ? Enlist common features of active site in enzymes.

$$7\frac{1}{2} + 7\frac{1}{2} = 15$$

- (b) Write short notes on the following : $2\frac{1}{2} \times 2 = 5$

(i) Enzyme activity and its units

(ii) Specific enzyme activity and its units

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2. Discuss the following : 10+10=20
- (a) Types of enzyme assays
 - (b) Proximity and orientation mechanism of catalysis
3. (a) Derive and draw plot for any *two* of the following : 5+5=10
- (i) Hanes-Woolf Plot
 - (ii) Eadie-Hofstee Plot
 - (iii) Lineweaver-Burk Plot
- (b) Compare key advantages and disadvantages of different flow formats used in enzyme kinetics. 10
4. (a) Distinguish between Ordered and Random sequential mechanisms of enzyme catalysis. What are non-sequential reactions ? 10+5=15
- (b) Write a note on irreversible enzyme inhibition. 5
5. (a) What is meant by feedback inhibition ? Describe its different types. 10

- (b) Give a detailed account of the following pro-enzymes and their activation : 5+5=10
- (i) Trypsinogen
 - (ii) Chymotrypsinogen
6. (a) What are isozymes ? Discuss their origin. 10
- (b) Give an overview of Pyruvate dehydrogenase multienzyme complex. 10
7. Write notes on the following methods of enzyme purification : 4×5=20
- (a) Dialysis and ultrafiltration
 - (b) Ion-exchange chromatography
 - (c) Dye-ligand chromatography
 - (d) Centrifugation
8. (a) Discuss the role of enzyme therapy in medicine. 10
- (b) Explain any *two* of the following : 5+5=10
- (i) Applications of enzymes in food industry
 - (ii) Enzymes in wastewater management
 - (iii) Enzyme Engineering

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