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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

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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