

B.Sc. Semester - 4 (NEP-2020) Examination**March/April-2026****BIT: Enzymology (Major-8)****Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1 Answer the following questions: (5 Marks of each) (10)
1. Discuss the IUB Enzyme Nomenclature and the general classification of enzymes.
 2. Explain the properties of enzymes with a focus on specificity and catalytic efficiency.
- OR
1. Differentiate between Coenzymes, Cofactors, and Prosthetic Groups with examples.
 2. What are Isoenzymes? Explain their biological and diagnostic significance.
- Que.2 Answer the following questions: (5 Marks of each) (10)
1. Describe the mechanisms of Acid-base catalysis and covalent catalysis.
 2. Explain how Metal Ion catalysis contributes to the acceleration of enzymatic reactions.
- OR
1. Discuss Enzyme Regulation through Feedback Inhibition and Covalent Modifications.
 2. Explain the concept of Multi-enzyme Systems and their role in metabolic pathways.
- Que.3 Answer the following questions: (5 Marks of each) (10)
1. Provide the Michaelis-Menten derivation and explain its applications in kinetics.
 2. Explain the methods used for the determination of K_m and V_{max} .
- OR
1. Compare and contrast Competitive and Non-competitive inhibition.
 2. Describe Uncompetitive inhibition and how it affects the rate of enzyme-catalyzed reactions.
- Que.4 Answer the following questions: (5 Marks of each) (10)
1. Outline the methods of enzyme isolation using extraction and precipitation techniques.
 2. Discuss the role of Chromatography and Electrophoresis in enzyme purification.
- OR
1. Define Enzyme Immobilization and describe the different methods/types available.
 2. Discuss the various applications of immobilized enzymes in the medical and industrial sectors.
- Que.5 Answer the following questions: (5 Marks of each) (10)
1. Explain the historical background and the fundamental definition of enzymes.
 2. Detail the factors affecting enzyme activity, specifically pH and Temperature.
- OR
1. Discuss how substrate concentration and inhibitors influence the rate of reactions.
 2. Summarize the general workflow of enzyme purification from a crude source.
