This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **1780**

Unique Paper Code : **2492011201**

Name of the Paper : **Enzymes**

Name of the Course : **B.Sc. (Hons.) Biochemistry (NEP)**

Semester : **II**

Duration : **2 Hours** Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

There are *six* questions.

Attempt any *four* questions. *All* questions carry equal marks.

Question No. **1** is compulsory.

1. (*a*) Explain the following statements : 5×2

(*i*) A pure enzyme has maximum specific activity.

(*ii*) V_{max} is directly proportional to enzyme concentration.

(*iii*) Binding energy released upon enzyme-substrate binding lowers the activation energy of the reaction.

(*iv*) Prosthetic groups are tightly linked to enzymes.

(*v*) Michaelis-Menten constant does not always reflect the affinity of the enzyme for the substrate.

P.T.O.

(*b*) Identify/Give an example of the following : 5

(*i*) Non-proteinaceous enzyme

(*ii*) Enzyme used in ELISA

(*iii*) Enzyme responsible for methanol poisoning

(*iv*) Translocase

(*v*) Allosteric enzyme

2. (*a*) What is the significance of the following ? 6

(*i*) Lineweaver Burk plot is used for determining enzyme kinetic constants.

(*ii*) Some enzymes are synthesized as inactive precursors.

(*b*) Chymotrypsin is an example of both acid-base and covalent catalysis. Explain. 6

(*c*) To which class of enzymes the following belong ? 3

(*i*) Cholesterol oxidase

(*ii*) Lactate dehydrogenase

(*iii*) Chymotrypsin.

3. (*a*) Differentiate between the following : 12

(*i*) Competitive and uncompetitive inhibition

(*ii*) Lock and key hypothesis and induced fit hypothesis

(*iii*) Metal activated enzymes and metalloenzymes

(*iv*) Single displacement and double displacement bisubstrate reaction.

(*b*) Amoxicilin and Clavulinic acid are combined in a widely used pharmaceutical formulation used to treat bacterial infections. Explain the rationale behind this formulation. 3

4. (*a*) Identify the type of reactions in which the following coenzymes participate. Give an example of the reaction catalyzed. 9

(*i*) Thiamine pyrophosphate (TPP)

(*ii*) Nicotinamide adenine dinucleotide (NAD)

(*iii*) Pyridoxal phosphate (PLP)

(*b*) What is the ratio of [S] to K_m when velocity of an enzyme catalysed reaction is 90% of maximum velocity ? 3

(*c*) Briefly explain the allosteric regulation of ATCase enzyme. 3

5. (*a*) What are immobilized enzymes and how are they useful in biotechnology? 5

(*b*) Explain the applications of enzymes in the field of medicine and diagnostics with examples. 5

(*c*) Describe how the enzyme Glycogen phosphorylase is regulated by covalent modification. 5

6. Write short notes on the following : 5,5,5

(*i*) Coupled assays

(*ii*) Isoenzymes

(*iii*) Structural analogues.