Roll No:

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M.Sc. Biochemistry, Semester-I Examination-2023

Paper Title: Enzymes
Paper Code: MBC 103

Time: 3hour **Max Marks: 75**

Note: *This paper has 3 sections A, B, and C, Attempt all the three sections*
Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice

Abbreviations Used
CLO- Course Learning Outcome, PLO- Program Learning Outcome, BTL- Bloom Taxonomy Level: BT level 1- Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Section A (Attempt all questions) (1X10=10 Marks)

Q. No	Questions	BTL	CLO	PLO
A	One katal is that amount of enzyme that catalyzes the conversion of	1	5	3
B	RNase P is an endoribonuclease enzyme involved in processing of.....	3	1	3
C	Isoenzyme form of LDH .....that elevates during Myocardial infraction	5	4	3
D	At saturating [S] concentration, the enzyme catalyzed reaction follows.....order reaction kinetics.	4	3	2
E	Steady state in enzyme catalyzed reaction is, concentration of.....remains constant overtime.	3	3	2
F	Lysozyme uses .....mechanism of enzyme catalysis	4	2	3
G	Chymotrypsin stabilizes the tetrahedral oxyanion transition state of the substrate in the active site. The amino acid important for oxyanion hole are.....	1	2	3
H	The effective concentration (C_{eff}) equals.....	2	2	3
I	The value of Hill's coefficient (n) for binding of oxygen to Hb is	5	4	3
J	$S_{0.5}$ is the ligand or substrate concentration required to completely saturate (100%) the enzyme (True/False)	3	3	2

SECTION B: Long type Questions (Attempt any two out of four) (2X15=30 Marks)

Q. No	Questions (Any Two)	BTL	CLO	PLO
1	What is the role of coenzymes in enzymatic catalysis. Name one coenzymes derived from vitamins including its structure	1	1	2

2	Discuss briefly the different mechanisms of enzyme inhibition with suitable examples	5	3	2
3	What are the different catalytic mechanisms of enzymes. Describe the catalytic mechanism of Lysozyme	2	2	3
4	Describe the kinetics and regulation of allosteric enzymes	5	2	2

SECTION C: Short-type Questions. (Attempt all questions, each question has an internal choice)

(5X7=35 Marks)

Q. No	Questions	BTL	CLO	PLO
1	What are the different properties of enzymes and their mechanism of action **OR** Define Enzyme Activity and Calculate the specific activity of Enzyme B in the Crude extract as U/mg, where enzyme activity is 9.9 U/cm^3 and protein concentration is 10.8mg/cm^3	4	5	3
2	Define Isoenzymes and also explain clinical significance of LDH as isoenzymes **OR** Explain Fatty Acid Synthase as Multifunctional Enzyme	3	4	3
3	Applying the Michaelis-Menten Equation, An enzyme is found that catalyzes the reaction, A-----B. Researchers find that the K_m for the substrate A is 4μM, and the k_{cat} is 20 min^{-1}. In an experiment, [A] =6 mM, and V0 & 480 nM min^{-1}. What was the [E_t] used in the experiment **OR** Derive the Michaelis-Menten equation for Competitive Inhibition. Also mention examples of competitive inhibitors	5	3	2
4	Graphically explain LB Plot **OR** Explain Competitive Inhibition and also mention significance Of competitive inhibitors that are used as drug	4	4	3
5	Explain the Mechanism of Covalent Catalysis with reference to Glucosyl-Enzyme Intermediate **OR** Describe Proximity and Orientation Effect of enzyme catalytic mechanism with suitable diagram	2	2	3
6	Explain Allosteric Regulation of Enzyme with suitable diagram **OR** Discuss in detail Class-I non-enzymatic reactions	2	1	2
7	What are the different methods for the immobilization of enzymes **OR** Give detail explanation of Models of Cooperativity	4	5	4

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