



Shahjalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
B. Sc. (Hons) 2nd Year 2nd Semester Final Examination, 2013
Course No. : **BMB 224** Course Title: **Enzymology-II**
Credit: **2.0** Total Marks: **70** Time: **2** Hours

Instructions:

- Number in the right side indicates the marks of the question.
- Marks for each question are same.
- Answer any two (2) questions from each Part (A and B).

PART-A

- a) Define following terms (any three) 4.5

 - Allosteric regulation,
 - Positive modulation
 - Cooperativity,
 - Heterotropic regulation
- b) Enzymes do not change the state of equilibrium but alter the reaction rate, Justify? 3.0

c) How ATP serves as a negative allosteric modulation for PFK in glycolysis? 4.0

d) Describe the MWC model for cooperative binding and kinetics 6.0
2. **Explain the following statements;** (5x3.5) 17.5

 - Enzymes can be regulated by covalent and non covalent modification
 - Covalent modification is a means of regulating enzymatic activity
 - Many enzymes are activated by the proteolytic cleavage
 - Isoenzymes provide a means of regulation specific to distinct tissues and developmental stages
 - Hexokinase I and Hexokinase IV have different functions and regulation
- a) What is catalytic triad? Discuss the reaction mechanism of chymotrypsin while mentioning the role of catalytic triad? 7.0

b) Describe the role of oxyanion hole? 1.5

c) Chymotrypsin is a proteolytic enzyme, explain the statement 4.0

d) Show schematically the effect of CTP and ATP on the kinetic profile of enzyme aspartate transcarbamylase (ACTase) 5.0

PART-B

4. a) How water soluble vitamins function as cofactor? 3.0
b) Write down the function of cofactor Zn^{2+} and Ni^{2+} 4.0
c) What is G protein couple receptor? How it activates adenylate cyclase 5.0
d) Ribozymes provide key insight in the RNA world hypothesis, justify the statement. 5.5
5. **Explain the following statements;** (5x3.5) 17.5
a) Living organisms do not violate the second law of thermodynamics.
b) Phosphoenolpyruvate (PEP) is a high energy compound.
c) Hemoglobin transports oxygen efficiently by binding oxygen cooperatively.
d) Binding Energy contributes to the reaction specificity and catalysis.
e) The free energy change for ATP is large and negative.
6. a) Define acid base catalysis and covalent catalysis? 2.5
b) Mode of action of Lysozyme involves acid base and covalent catalysis, explain the statement. 4.5
c) Explain the statements- (3x3.5) 10.5
i. Carboxypeptidase is an excellent example of induced fit hypothesis
ii. RNase A cleaves single stranded RNA
iii. Lysozyme cleaves between C1 and O not between C4 and O of peptidoglycan.