ShahJalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
B. Sc. (Hons) 2nd year 1st Semester Examination, 2012
Course No. : **BMB -221** Course title: **Enzymology-I**
Credit: **2** Total marks: **70** Time: **2** hours

Instructions:

- *Number in the right side indicates the marks of the question*
- *Answer any two questions from each part (Part A & B).*

Part A

1. (a) Define: Enzyme, cofactor, apoenzyme and holoenzyme. 6
   (b) Write down the classification of enzymes. 6
   (c) Summarize the key features of the *active sites* of enzymes. 5.5

2. (a) Deduce the Michaelis-Menten equation for single substrate enzyme reaction. 10
   (b) Write down the significance of K_m and V_{max} value. 4.5
   (c) Justify that allosteric enzyme do not obey Michaelis-Menten kinetics. 3

3. (a) Justify: 5×3 =15
   (i) Enzymes have immense catalytic power.
   (ii) Binding energy contributes to specificity and catalytic activity of enzymatic reactions. 2.5
   (iii) Weak interactions between enzymes and substrate are optimized in the transition state.
   (b) Enzymes alter only in reaction rate not the reaction equilibrium-explain.

Part B

4. (a) What is enzyme inhibition? Contrast reversible and irreversible enzyme inhibition. 6
   (b) Describe the effects of competitive and noncompetitive inhibitors on the kinetics of enzyme reactions. 7.5
   (c) Describe the functions and uses of enzyme inhibitors. 4

5. (a) Describe the effects of P^H and temperature on enzyme reaction. 6
   (b) Briefly describe the effects of coenzyme and cofactor on enzyme reaction. 6.5
   (c) Describe how the Km for an enzyme may be experimentally determined. 5

6. (a) Write down the factors that control in enzyme assays. 5
   (b) "Enzymes are high specific"- explain. 3.5
   (c) Write short notes on any three of the followings: 3×3 =9
   (i) Double-displacement enzyme (ping-pong) reaction; (ii) Enzyme units; (iii) K_{cat}/K_m criterion in kinetic perfection; (iv) Enzyme assay; (v) Ribonuclease inhibition