

[130]

No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY

M. Sc. THIRD SEMESTER INDUSTRIAL BIOTECHNOLOGY EXAMINATION

TUESDAY, DATE: 04-12-2012

PS03CIBT03 ENZYMOLOGY

TIME: 2:30 to 5:30 pm

MAX. MARKS: 70

Q-1 Select (tick 'v') the correct answer from the following

[08]

1. The term K_{cat}/K_m is
 - a. Efficiency constant
 - b. Proficiency constant
 - c. Specificity constant
 - d. All of the above
2. In a substrate saturation curve in presence of a reversible enzyme inhibitor, if the x and y intercepts change, but the slope remains constant with the increase in inhibitor constant in LB plot, the type of inhibition is
 - a. Competitive
 - b. Non competitive
 - c. Uncompetitive
 - d. Mixed
3. Which of the following is false for MM kinetics?
 - A. $K_m = \frac{1}{2} V_{max}$
 - B. $V_0 = K_2 [E_0]$
 - C. $V_{max} = K_2 [ES]$
 - D. $K_m = [E][S]/[ES]$
 - a. Only A is false
 - b. B and C are false
 - c. A B C are false
 - d. All are true
4. EC 1.1.1.1 represents
 - a. Alcohol dehydrogenase
 - b. Invertase
 - c. Chymotrypsin
 - d. Lysozyme
5. Chymotrypsin is an example of
 - a. Electrostatic catalysis
 - b. Covalent catalysis
 - c. Sigmoidal kinetics
 - d. None
6. Fold purification is
 - a. Test of homogeneity
 - b. Number of times the enzyme concentration increases
 - c. Number of times the unit activity increases
 - d. Number of times specific activity increases

(1)

7. Protein engineering is predetermined alterations in protein by
 - a. Addition or deletion of one amino acid
 - b. Addition or deletion of more than one amino acids
 - c. Deletion of protein domain
 - d. All of the above
8. Ribozymes are
 - a. Isozymes
 - b. Oligomeric proteins
 - c. RNA catalysts
 - d. Catalytic antibodies

Q-2 Attempt: (Any Seven)**[14]**

- a. Define turnover number
 - b. Explain principle of affinity chromatography
 - c. What is ping-pong mechanism?
 - d. What is covalent catalysis?
 - e. Write the Michaelis Menton assumption.
 - f. Draw Cornish-Bowden Eisenthal plot
 - g. Draw Arrhenius plot
 - h. Describe the hemoglobin structure
 - i. Write the Adair equation for a tetrameric enzyme.
- Q. 3 a) Derive an equation for Mixed Inhibition (06)
- b) Explain with the help of equation, the Dixon plot for Competitive inhibition (06)
- OR
- b) Explain how we differentiate between binary and ternary complex mechanisms in a two substrate reaction (06)
- Q. 4 a) Explain with suitable examples how we study enzyme mechanisms. (06)
- b) Explain the active site structure of chymotrypsin (06)
- OR
- b) Explain the oligomeric structure of ATCase (06)
- Q. 5 a) Write a note on: MWC and KNF models (06)
- b) "Allosteric enzymes follow sigmoidal kinetics", explain giving example (06)
- OR
- b) "ATCase follows MWC model", justify (06)
- Q. 6 a) Analyze the given substrate saturation data for Invertase reaction by suitable plot to determine K_m , V_{max} and K_{cat} .

[S] mmol/ L	5.0	6.67	10	20	40
Velocity $\mu\text{moles/L/min}$	147	182	233	323	400

Given: $[E] = 0.05 \text{ mg/ml}$, Mol wt 55 kd.

(06)

- b) Explain Protein engineering giving suitable examples (06)

OR

- b) "Hemoglobin is an excellent Oxygen carrier", Justify (06)
