No. of Printed Pages: 02

[46]

SARDAR PATEL UNIVERSITY

M. Sc. SECOND SEMESTER BIOCHEMISTRY EXAMINATION

SATURDAY, DATE: 25-04-2015

PS02CBIC03 ENZYMOLOGY

TIME: 2:30 to 5:30 pm **MAX. MARKS: 70**

Q. 1 Choose the correct answer (08)

1. After distrupting the plant cell wall which of the following compound might you add to prevent oxidation of phenolic compound?
   a) buffer b) ATP
   c) NaCl d) polyvinylpyrrolidone

2. When the Vmax and slope change but the Km remains unchanged in presence of a reversible inhibitor, the type of inhibition is
   a) Competitive b) Noncompetitive
   c) Uncompetitive d) allosteric.

3. The important factors that contribute to rate enhancement in serine proteases is
   a) covalent catalysis b) proximity and orientation
   c) oxyanion hole d) All of these

4. Which graphical method is used to determine an enzyme degree of cooperativity?
   a) Hill plot b) Hanes plot
   c) Cornish-Bowden Eisenthal plot d) Dixon plot

5. The general mechanism is that an enzyme act by
   a) Increasing activation energy b) changing local pH
   c) Decreasing activation energy d) all of these

6. Kcat/Km is
   a) efficiency criteria b) proficiency criteria
   c) specificity criteria d) all of these

7. In Cornish-Bowden Eisenthal plot
   a) 1/[S] is plotted against 1/V b) ln V is plotted against 1/T
   c) Vmax is Plotted against Km d) [P] is plotted against time

8. In MM kinetics when velocity is ½ Vmax the substrate concentration is equal to Km. What will be the substrate concentration equal to when velocity is Vmax?
   a) ½ Km b) Infinite
   c) 2Km d) $[E_0]$

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

a. Define Unit and specific activities of Enzyme
b. What is turnover number.
c. Write the original Michaelis Menton equation
d. What is partial inhibition.
e. What is enzyme speficity?
f. Define fold purification.
g. What is rate enhancement?
h. Draw LB plot.
i. Draw the secondary plot for Non-competitive inhibition.

Q. 3 a) What are the strategies for enzyme purification? Explain choice of source of enzyme in detail (06)

b) Explain the Sanger's method for the determination of amino acid sequences

OR

b) Explain one of the separation methods based on the specific binding site of the enzyme molecule (06)

Q. 4 a) Explain uncompetitive inhibition and derive MM equation in presence of an uncompetitive inhibitor (06)

b) Discuss binary and ternary complex mechanisms of two substrate reactions and explain how do we experimentally differentiate them

OR

b) A biochemist studies the properties of a metabolic enzyme she has just isolated. She obtains kinetic data in the presence and in the absence of two different inhibitors (A and B).The following results were obtained:

[S] (mol/L)	Without inhibitor v (µmol/min)	With inhibitor A [I] = 5 x 10-4 M v (µmol/min)	With inhibitor B [I] = 3.2 x 10-6 M v (µmol/min)
5 x 10-4	1.25	0.82	0.48
2.5 x 10-4	0.87	0.49	0.33
1.7 x 10-4	0.67	0.36	0.25
1.2 x 10-4	0.54	0.26	0.20
1 x 10-4	0.45	0.23	0.17

Determine the type of inhibition (06)

Q. 5 a) Explain the factors acid –base catalysis and covalent catalysis with suitable example (06)

b) Explain the MWC and KNF models (06)

OR

b) Discuss the mechanism of Chymotrypsin action (06)

Q. 6 a) Discuss applications of Enzyme engineering giving suitable examples (06)

b) Explain control of enzyme activity by reversible changes in covalent structure of enzyme (06)

OR

b) Explain enzyme induction, repression and feedback inhibition with suitable example (06)

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