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SARDAR PATEL UNIVERSITY
M.Sc. Integrated Biotechnology EXAMINATION (V Semester)
Thursday 29th November, 2012
Time:10:30 a.m. to 1:30 p.m.
PS05CIGB01-ENZYMOLOGY

Total Marks : 70

Q : 1 Multiple Choice Questions. [08]

1) Lock and Key hypothesis was suggested by_____.
   a) Koshland c) Fischer
   b) Both (1) & (2) d) None of above
2) Flavin nucleotides are derived from _____.
   a) Vitamin B_1 c) Vitamin B_{12}
   b) Vitamin B_2 d) Vitamin B_6
3) Ion exchange chromatography depends on the _____ between species of opposite change.
   a) Ionic strength c) Electrostatic attraction
   b) Affinity d) Hydrophobic interaction
4) Gel filtration is the method in which protein purification depend on_____.
   a) Polarity c) Change in solubility
   b) Size d) Structural features
5) _____ inhibitors closely resemble the substrates.
   a) Competitive c) Uncompetitive
   b) Non competitive d) Mixed
6) _____ is the slope of Eadie-Hofstee.
   a) $^{1}/_{Vmax}$ c) –Km
   b) $^{Km}/_{Vmax}$ d) $^{Vmax}/_{Km}$
7) In a mixture of the five proteins listed below, which should elute second in size exclusion (gel filtration) chromatography?
   a) Cytochrome c Mr=13,000 c) Immunoglobulin G Mr= 145,000
   b) Ribonuclease A Mr= 13,700 d) RNA polymerase Mr= 450,000
8) In an SDS-PAGE gel
   a) Proteins are denatured by the SDS c) Larger proteins migrate more slowly
   b) Proteins have same charge-to mass ratio d) All of the above

Q : 2 Answer the following questions. (Attempt any seven) [14]

1) What is suicide inhibition. Explain with an example
2) Differentiate between coenzyme and cofactor.
3) What is active site of enzyme?
4) Enlist the methods for protein purification based on polarity.
5) What is differential centrifugation.
6) Derive Hanes plot equation.
7) Write the advantages of immobilized enzyme.
8) Define a second order reaction.
9) Write a note on isoenzymes. Give only one exmaple.

Q : 3 (a) Describe ping-pong mechanism with example. [06]

(b) Explain role of FAD in enzyme catalysis with suitable example. [06]

OR

(b) Give an account on transition state stabilization hypothesis. [06]

Q : 4 (a) Write a note on Affinity Chromatography. Illustrate with a schematic diagram. [06]

(b) Describe in detail Gel filteration method for purification of proteins. [06]

OR

(b) Write the methods for homogenization of tissue. [06]

Q : 5 (a) Derive Michaelis-Menten equation for an uncompetitive enzyme inhibition. [06]

(b) Explain in detail allosteric inhibition with example. [06]

OR

(b) Write a short note on clinical significance of competitive inhibition of enzyme. [06]

Q : 6 (a) An enzymatic assay was carried under two different sets of conditions [06]
The results are tabulated as below. Plot a lineweaver-Burke plot and calculate Vmax and Km for both conditions. Also comment on the kind of inhibition displayed.

S (μMol)	Vo-A	Vo-B
0.100	2.246	5.130
0.033	1.667	3.700
0.020	1.342	2.941
0.010	0.901	1.890
0.005	0.540	1.110

(b) Discuss various methods used for immobilization of enzyme. [06]

OR

(b) Describe in brief the application of enzymes in industries. [06]

—X—