

SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology Examination, 5th Semester
Monday, 17-10-2016
2:00 pm to 5:00 pm
PS05CIGB01: Enzymology

Total Marks: 70

Q-1 Answer the following Multiple Choice Questions. All are compulsory

[08]

1. What term is used for a non-protein organic molecule that is required by some enzymes in order to catalyse a reaction on a substrate?
a) Cofactor .b) Co-enzyme c) Modulator d) Prosthetic group
2. Induced fit hypothesis was proposed by _____.
a) Pasteur b) Fischer c) Koshland d) Pauling
3. In isoelectric focusing, _____ gradient is created.
a) Calcium chloride b) pH c) Sephadex d) All of the above.
4. Which Technique involves separation of an enzyme based on its charge?
a) Affinity chromatography b) Isoelectric focusing
c) Immunoabsorption d) Gas chromatography
5. Primary steps in protein purification includes
a) Homogenization b) Differential centrifugation c) Solubilization d) All of these
6. Which of the following statements about Michaelis-Menten kinetics is correct?
a) K_m , the Michaelis constant, is defined as the concentration of substrate required for the reaction to reach maximum velocity.
b) K_m , the Michaelis constant, is defined as the dissociation constant of the ES complex
c) K_m , the Michaelis constant, is expressed in terms of the reaction velocity.
d) K_m , the Michaelis constant, is a measure of the affinity the enzyme has for its substrate.
7. _____ occurs when the inhibitory chemical which does not have to resemble the substrate binds to the enzyme other than at the active site.
a) Non-competitive inhibition b) Competitive inhibition c) Uncatalysed reaction
d) All of them
8. The most commonly employed cross-linked polymer is
a) Cellulose b) Collagen c) Polyacrylamide gel d) Cation exchange resin

Q-2 Answer the following questions. (ANY SEVEN)

[14]

- (1) List the six classes of enzyme.
- (2) What are activators and inhibitors?
- (3) Name types of gels used during gel filtration.
- (4) By which methods the rigid cell wall can be lysed.
- (5) What is K_m ? Explain its relationship with V_{max} .
- (6) Explain principle of ion exchange chromatography.
- (7) Discuss 'feedback inhibition' with examples.
- (8) Give significance of immobilization of enzymes.
- (9) Explain isozymes of LDH.

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Q-3 (A) Explain: Transition state stabilization hypothesis. [06]

Q-3 (B) What is active site? List the important features of active site. [06]

OR

(B) 1) Explain Induced fit model of enzyme substrate interaction. [06]

2) Briefly describe three point interactions of enzyme and substrate.

Q-4 (A) List various methods used for the separation of protein based on polarity. Explain any two in detail. [06]

Q-4 (B) Describe the process of homogenization for mammalian, plant, fungal and bacterial cells [06]

OR

(B) Explain the steps involved in the separation of enzyme. [06]

Q-5 (A) Give derivations for Michaelis-Menten equation and MM plot for enzyme catalyzed reactions. [06]

Q-5 (B) What is reversible and irreversible inhibition? Explain competitive, uncompetitive and non-competitive reaction. [06]

OR

(B) Derive the Line weaver-Burk equation for uncompetitive enzyme inhibition. [06]

Q-6 (A) Describe entrapment method of immobilization with its advantages. [06]

Q-6 (B) Write a short note on Isoenzymes. Discuss any two examples in detail. [06]

OR

(B) Differentiate between enzymes and chemical catalysts. [06]

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