

[3/A-12]

SARDAR PATEL UNIVERSITY

M.Sc. Examination - April 2018

M. Sc. Integrated Biotechnology (IGBT) 5th Semester

Subject / Course code: - PS05CIGB01

Subject / Course Title: - Enzymology

25th April 2018 (Wednesday), 10:00 am to 1:00 pm

Maximum Marks: 70

Note:

- (1) All the Questions are compulsory.
- (2) Figures on the right indicate marks.

Q.1. Choose the correct option**1x8 = 8**

- (i) Enzymes are polymers of _____
[A] Hexose sugars [B] Amino acids
[C] Fatty acids [D] Inorganic phosphate
- (ii) Which one of the following reactions used for the purpose of recycling enzymes in bioprocesses?
[A] Isomerization [B] Phosphorylation
[C] Polymerization [D] Immobilization
- (iii) Most industrial enzymes are obtained from _____.
[A] Plants [B] Animals
[C] Microbes [D] Insects
- (iv) Induced fit hypothesis was given by _____.
[A] Emil Fischer [B] Daniel Koshland
[C] Wilhelm Friedrich Kuhne [D] James Watson
- (v) An organic substance bound to an enzyme and essential for its activity is called _____.
[A] isoenzyme [B] coenzyme
[C] apoenzyme [D] holoenzyme
- (vi) The Michaelis-Menton equation relates the rate of an enzyme catalyzed reaction to which of the following?
[A] Substrate concentration [B] Product concentration
[C] Activation energy [D] Inhibitor concentration
- (vii) Different enzymes that catalyze same reaction are called _____.
[A] coenzymes [B] isoenzymes
[C] Apoenzyme [D] All of these
- (viii) In isoelectric focusing, _____ gradient is created.
[A] Calcium chloride [B] pH
[C] Sephadex [D] All of these

I

Q.2. Attempt any seven of the following

2x7 = 14

- (a) Write difference between catalyst and enzyme.
- (b) Enlist the six classes of enzymes.
- (c) Enlist various cell and tissue disruption methods.
- (d) Outline the principle of 'salting out' in enzyme purification.
- (e) What is K_M ? Explain its relationship with V_{max} .
- (f) Define enzyme activity.
- (g) Distinguish between metalloenzymes and metal activated enzymes.
- (h) Advantages of immobilized enzymes.
- (i) Differentiate activators and inhibitors with examples.

Q. 3. (A) Discuss in detail the Lock and Key, induced fit and stabilization state hypotheses for enzyme specificity with suitable illustrations. [06]

(B) Discuss in detail first order, second order and zero order reactions with suitable equations. [06]

OR

Q. 3. (B) What is an active center? Describe the most accepted 3-point interaction theory for explaining stereo-chemical specificity of enzymes. [06]

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

(B) Describe methods of homogenization for mammalian, plant, fungal and bacterial cells. [06]

OR

Q. 4. (B) Explain in the steps involved in the separation of enzyme. [06]

Q. 5. (A) Derive the Michaelis-Menten equation in steady state condition for enzyme catalyzed reactions [06]

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

OR

Q. 5. (B) Write a note on the factors affecting rate of enzyme-catalyzed reaction. [06]

Q. 6. (A) Enlist various methods of immobilization of enzymes and explain in detail the covalent bonding method of immobilization. [06]

(B) What are isoenzymes? Give detailed account on Creatinine Phospho kinase (CPK) with clinical significance. [06]

OR

Q. 6. (B) Explain in detail the industrial applications of enzymes with suitable examples. [06]

