

Seat No. : \_\_\_\_\_

**DA-112**

**December-2013**

**B.Sc. Sem.-V**

**Biochem 303 : Biochemistry Theory**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. (A) (i) Briefly describe zymogen conversion using chymotrypsin as an example. **7**  
(ii) Briefly explain the historical development of Enzymology. **7**

**OR**

- (B) (i) Give an account on PDH complex. Add a note on the advantages of MEC.  
(ii) Compare and contrast enzyme to chemical catalysts.

2. (A) (i) Give an account on Isoenzymes. Discuss the physiological significance. **7**  
(ii) Discuss the role of adenylate cyclase as a membrane bound enzyme. **7**

**OR**

- (B) (i) Explain the different associations of metals in metalloenzymes and their properties.  
(ii) What is significant about glycerol phosphate dehydrogenase.

3. (A) Describe the four digit classification of enzymes with suitable example. **14**

**OR**

- (B) Explain the various factors affecting enzyme catalysis.

4. (A) Taking acetyl CoA Carboxylase as an example, explain properties, mechanism of action and regulation by allosteric enzymes. **14**

**OR**

- (B) (i) Giving examples, explain mechanism of enzyme reaction with two substrates. **7**  
(ii) Explain allosteric properties using glycogen phosphorylase. **7**

5. Each question carries 1 mark :

14

**State true or false and correct if the statement is false :**

- (i) Koshland proposed the Lock and key model for enzyme catalysis.
- (ii) The first enzyme purified is lactate dehydrogenase.
- (iii) Selenium can be a metal in enzyme function.
- (iv) Glycogen phosphorylase requires TPP as the coenzyme.

**Fill in the blanks :**

- (v) Scientist who coined the term 'enzyme' is \_\_\_\_\_.
- (vi) The concept of Ribozyme was proposed by \_\_\_\_\_.
- (vii) An agar gel electrophoretic separation of LDH shows \_\_\_\_\_ bands. (you may also draw a figure)
- (viii) The reaction catalyzed by ATCase is \_\_\_\_\_.
- (ix) Define synzyme. Give an example.
- (x) What is an allosteric site ? Give its significance.
- (xi) The hormone responsive metabolite which allosterically stimulates PFK and inhibits fructose biphosphatase is
  - (a) Citrate
  - (b) ATP
  - (c) Fructose 2, 6 BP
  - (d) cAMP
- (xii) Major breakthrough in enzymology was given by \_\_\_\_\_ when he demonstrated that fermentation is possible event with the filter of yeast extract.
  - (a) Sumner
  - (b) Pasteur
  - (c) Buchner
  - (d) Michelis
- (xiii) The "lock and key" model of enzyme action illustrates that a particular enzyme molecule
  - (a) forms a permanent enzyme-substrate complex
  - (b) may be destroyed and resynthesized several times
  - (c) interacts with a specific type of substrate molecule
  - (d) reacts at identical rates under all conditions
- (xiv) A student conducts an experiment to test the efficiency of a certain enzyme. Which would probably not result in a change in the enzyme's efficiency ?
  - (a) Adding an acidic solution to the setup
  - (b) Adding more substrate but not enzyme
  - (c) Keeping the mixture in a refrigerator
  - (d) Closing the mouth of the test tube with a stopper and covering the tube in aluminium foil to prevent interaction with light.