(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 154404   Roll No. ☐☐☐☐☐☐☐☐☐☐

B.Tech.

(SEM. IV) THEORY EXAMINATION 2013-14

ENZYME ENGINEERING

Time : 3 Hours   *Total Marks : 100*

Note :– Attempt all questions.

1. Attempt any two parts of the following :   (10×2=20)

   (a) Explain the following terms :

       (i)   Enzymes

       (ii) Specificity

       (iii) Cofactors

       (iv) Coenzymes

   (b) Explain the procedure for extracting a cytosolic enzyme. What are the various techniques used for the purification of the extracted enzyme ?

   (c) What are enzyme assays ? Discuss continuous and stop time assays.

2. Attempt any two parts of the following :   (10×2=20)

   (a) What is an active site ? Discuss the key features of an active site.

   (b) Discuss the Michaelis-Menten and Briggs Haldane approach for single substrate enzyme kinetics.

(c) Write short notes on any **two** of the following :

    (i) Multi substrate reactions of enzymes.

    (ii) K_m, K_s and turnover number.

    (iii) Significance of V_{max} and k_{cat} values.

3. Attempt any **two** parts of the following :   (10×2=20)

(a) What do you understand by enzyme inhibition ? Explain reversible enzyme inhibition.

(b) What are allosteric enzymes ? Explain the mechanism and regulation of allosteric behavior.

(c) Write short notes on any **two** of the following :

    (i) Mixed inhibition

    (ii) Substrate and product inhibition

    (iii) Uncompetitive inhibition.

4. Attempt any **two** parts of the following :   (10×2=20)

(a) Discuss the properties of immobilized enzymes.

(b) What do you understand by enzyme immobilization ? What are the various applications of immobilized enzymes ?

(c) Describe any **two** of the following with examples :

    (i) Redox enzymes

    (ii) Cross linking

    (iii) Enzyme electrodes.

5. Attempt any **two** parts of the following :   (10×2=20)

(a) What are immobilized enzyme reactors ? Discuss any two reactors in detail.

(b) What are biosensors ? Discuss their principle, components and working.

(c) What are the important features of enzymes which make them suitable for use in biosensor ? Support your answer with the help of suitable example.