B 2247

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Third Semester

Industrial Bio-Technology

IB 232 — BIO-ORGANIC CHEMISTRY

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by supramolecular chemistry?

2. What is ATP? Write its molecular structure.

3. Mention the activities of the following coenzymes.

   (a) Acyl phosphate

   (b) S-adenosyl methionine

4. What are essential amino acids?

5. What do you mean by intra molecular catalysis? Give one example.

6. List out any two applications of immobilized enzymes.

7. Name any two enzymes used as a catalyst for the hydrolysis of peptides.

8. Write any two important biological functions of zinc in our body.

9. How lipid can influence the catalytic behaviour of an enzyme?

10. What are the limitations of using miscelles in enzyme model?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are bioisosteric groups? Give any two examples. (8)

(ii) List out the various categories of molecular association. (8)

Or

(b) (i) Explain how the proximity of reactive groups accelerates the rate of reaction. (8)

(ii) Distinguish between receptor and catalysts. (8)

12. (a) (i) Describe the formation of peptide bond in the biological system. (8)

(ii) What are α-amino acids? Explain any two methods of asymmetric synthesis of α-amino acids. (8)

Or

(b) (i) Compare any two examples of enzymatic transformations and their analogs in organic chemistry. (8)

(ii) What do you mean by chemical mutation? Explain its role in enzyme chemistry. (8)

13. (a) (i) Draw the free energy diagram and explain the role of catalyst in a reaction. (8)

(ii) Explain the catalytic mechanism of α-chymotrypsin. (8)

Or

(b) (i) Describe the stereoelectronic control in hydrolytic reaction. (8)

(ii) List out the six important groups of enzymes used in synthetic organic chemistry. (8)

14. (a) (i) Explain how' iron functions as an electron carriers in biological systems. (10)

(ii) Write a note on bio models for photosynthesis. (6)

Or

(b) (i) Explain the important biological functions of copper ions. (10)

(ii) Mention the biological activities of Vitamin B_{12}. (6)

15. (a) (i) What are the basic requirements for the design of good enzyme model? (8)

(ii) Explain how crown ether can form stable complexes with metal ions with suitable examples. (8)

Or

(b) (i) What is α-cyclodextrin? Mention its application in biomimetic chemistry. (10)

(ii) Explain the use of steroid templates in enzyme design. (6)