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Q 2301

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Third Semester

Industrial Biotechnology

IB 232 — BIO-ORGANIC CHEMISTRY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the important differences between enzymes and coenzymes.
2. What do you mean by Bio-isosteric groups? Mention their importance in molecular pharmacology.
3. Write an example for catalytic reaction involving metallo enzymes.
4. What do you understand by chemical mutation?
5. Distinguish between heterogeneous catalyst and homogeneous catalyst.
6. Mention the various factors responsible for enzyme specificity.
7. What are micelles?
8. What is peptide bond? Give any one example of enzyme that will catalyse hydrolysis of peptide bond.
9. What is the role of iron in our body?
10. Write an example for remote functionalisation reaction.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With suitable example, explain how proximity effects are important to design biomolecules. (8)
- (ii) What are the advantages of biomodels when they are compared with real biological systems? Discuss. (8)

Or

- (b) (i) What are the various types of molecular associations in Biomolecules? Explain. (8)
- (ii) Write a short note on Supra molecular chemistry. (8)
12. (a) (i) There is analogy between organic reactions and biochemical transformations. Justify this statement with two examples. (8)
- (ii) Illustrate the role of RNA in protein synthesis. (8)

Or

- (b) (i) What do you mean by N-Terminal and C-Terminal amino acids? Write any two methods to synthesis of amino acids. (8)
- (ii) What is asymmetric synthesis? Give an example involving the formation of a biomolecule by asymmetric synthesis. (8)
13. (a) (i) With help of a suitable Free-energy diagram, explain how a catalysed reaction becomes faster. (8)
- (ii) What do you mean by Intramolecular catalysis? Illustrate with an example. (8)

Or

- (b) (i) Describe the catalytic action of α -chymotrypsin. (8)
- (ii) Explain the formation of tetrahedral intermediate and the stereo electronic control in hydrolysis of ester. (8)

14. (a) (i) Describe the role of zinc with the following enzymes : (8)
- (1) Carbonic anhydrase
 - (2) Carboxy peptidase.
- (ii) Explain the biological importance of Cu (I) and Cu (II) ions. (8)

Or

- (b) (i) Illustrate any four reactions involving coenzyme B₁₂. (8)
- (ii) Define photosynthesis reaction. Explain a suitable biomodel for photosynthesis. (8)
15. (a) (i) What are the necessary requirements for the design of good enzyme model? (8)
- (ii) Describe Host-Guest relationship of 12-crown-4-ether. (8)

Or

- (b) (i) What are advantages and limitations of using Miscelles in enzyme model? (8)
- (ii) Describe the structure of α -cyclodextrin. Mention its applications in biomimetic chemistry. (8)
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