M.Sc Sem IV April 17 P-I

Org. Chemistry

Q. P. Code: 09244

[Time: 2½ Hours] [Marks:60]

Please check whether you have got the right question paper.

N.B: 1. All questions are **compulsory**
2. Figures to the **right** indicate **full marks.**

Q.1 a Answer any two of the following: 8

i) What are bipartate prodrugs? Give an example of a bipartate drug and explain.

ii) What is QSAR? Give the Hancock modification of the Taft equation?

iii) Describe the modern method of drug design based on "computer aided molecular graphics."

iv) Explain the studies carried out by Hansch and give two forms of the modified Hansch equation.

b Attempt any one of the following: 4

i) Give the synthesis and one application of the following:
   1) Fenofibrate
   2) Cetrizine

ii) Give the synthesis and one application of the following:
   1) Fluconazole
   2) Oxyphenbutazone

Q.2 a Answer any two of the following: 8

i) State whether the following statements are true or false

A) Catabolic reactions are mainly oxidation reactions.

B) Lipoic acid is involved in the conversion of pyruvate to acetolactate.

C) Ylide of thiamine pyrophosphate is known as biological cyanide.

D) Pyridoxal phosphate is not a very versatile coenzyme.

ii) Give the structure of NADH and discuss any one biomodel of NADH.

iii) Explain the catalytic mechanism of thiamine pyrophosphate with reference to pyruvate decarboxylase.

iv) Explain the mechanism of action of acetyl CoA carboxylase which has biotin as a prosthetic group.

b Answer any one of the following: 4

i) Give a plausible mechanism for the conversion of methyl malonyl coenzyme A to succinly coenzyme A brought about by coenzyme B_{12} dependent enzyme.

ii) Give the mechanism of decarboxylation of an alpha amino acid brought about by pyriodoxal phosphate dependent enzyme.

Q.3 a Answer any two of the following: 8

i) Give any two examples of each of the following enzyme catalyzed reactions:
   1) Hydroxylation
   2) Hydrolysis

ii) Giving example show how amino acids are prepared by enzymatic processes.

iii) What is meant by "immobilized enzyme? Explain any one method used for immobilization of enzymes.

iv) Explain the role of glycogen synthase and the branching enzyme in glycogen synthesis.

[P.T.O]

b Answer any one of the following: 4

i) Show how L -ephedrine can be synthesized by microbial transformation. Give R/S configuration of the chiral carbon atoms in L –ephedrine.

ii) Explain how chiral hydroxy acids are prepared by enzymatic processes.

Q.4 a Answer any two of the following: 8

i) Explain the use of 'green solvents' and 'green catalysts' in green synthesis.

ii) Explain the role of polymer supported reagents in green synthesis with two examples.

iii) With reference to green chemistry write a note on "solid supported green synthesis".

iv) What are biocatalysts? Why the use of biocatalysts considered a green practice? Explain.

b Attempt any one of the following: 4

i) For the synthesis of adipic acid, compare the conventional method of synthesis with the green method.

ii) Discuss the conventional and the green synthesis of ibuprofen.

Q.5 Answer any four of the following: 12

a) Explain how biotechnology helps in drug design.

b) Give the synthesis and one application of diclofenac.

c) Give the metabolic functions of FAD.

d) Give the structure of lipoic acid. Explain the terms holoenzyme and apoenzyme.

e) Write a short note on production of vitamins by fermentation.

f) Show how penicillin G is biocatalytically converted to 6-aminopenicillanic acid. What are the advantages of this process?

g) Explain the use of ultrasound assisted reactions in green synthesis.

h) How ionic liquids play an important role in green synthesis? Explain.
