Q.P. Code :09246

[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 the two of the following:- 8

i Give the types and ideal properties of prodrugs. Explain the advantages of prodrugs.

ii Explain the studies carried out by Hansch for quantifying the relationship of structure to the activity of the drug.

iii What are the advantages and limitations of "computer aided molecular graphics" based drug design?

iv Give the Hancock modifications of the Taft equation?

b Attempt any one of the following:- 4

i Give the synthesis and one application of each of the following:-
1) Labetalol
2) Diclofenac

ii Give the synthesis and one application of each of the following:-
1) Esomeprazole
2) Methotrexate

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

i Give the structure of NAD^+.
Give the metabolic functions of enzymes dependent on NAD^+ / NADH.

ii Discuss how pyruvate dehydrogenase brings about conversion of enolic or enamine intermediate to acetyl coenzyme A.

iii Give the structure of biotin. Explain the metabolic functions of biotin dependent acetyl coenzyme A carboxylase.

iv Giving an example write a note on biomodelling studies of coenzymes.

b Answer any one of the following:- 4

i What are cytochromes? Discuss how cytochromes activate oxygen in biological systems.

ii Give the name and the structure of the coenzyme involved in each of the following enzymatic biochemical transformations
1) Cleavage of alpha hydroxy ketones
2) Transamination

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

i Give any two examples of each of the following enzyme catalyzed reactions:-
1) Oxidation
2) Reduction

ii Give the structure and importance of glycogen. Explain the stereochemistry involved.
List the names of the enzymes involved in breakdown of glycogen.

iii Explain how β- lactam antibiotics are produced by fermentation.

iv How are enzymes immobilized? What are its advantages?

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b Answer any one of the following:- 4

i Explain how L-ephedrine can be synthesized via microbial transformation. Give the importance of L-ephedrine.

ii Giving examples show how chrial hydroxy acids are prepared by enzymatic processes.

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

i What are the basic principles of green chemistry?

ii How ultrasound assisted reactions are useful in green synthesis?

iii With reference to green chemistry explain the use of ionic liquids for organic reactions.

iv Justify how green oxidation catalysts contribute to green synthesis?

b Attempt any one of the following:- 4

i For the synthesis of ibuprofen, compare the conventional method of synthesis with the green method.

ii Give the conventional and green synthesis of 4-aminodiphenylamine

Q.5 Answer any four of the following:- 12

a) Explain the concept of soft drugs .Mention their properties.

b) Give the synthesis and one application of fluconazole.

c) Show how flavin dependent monoxygenases transfer oxygen atom to the organic substrate.

d) Match the following

i)	Coenzyme A	A)isoalloxazine
ii)	FAD	B) corrin ring
iii)	Coenzyme B_{12}	C)pantoic acid

e) Giving examples show how amino acids are prepared by enzymatic processes.

f) Explain the chemical process with an enzyme in free form.

g) What are the factors to be considered while designing a green synthesis?

h) Explain the use of water and deep eutectic solvents as green solvents.
