

[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 maximum marks.

Q.1

a) Answer any two of the following:-

08

- What is 'QSAR'? Give the Hancock modification of the Taft equation.
- What are the advantages and limitations of 'computer aided molecular graphics' based drug design?
- Give the types and ideal properties of prodrugs.
- Explain the studies carried out by Hansch for quantifying the relationship of structure to the activity of the drug.

04

b) Answer any one of the following:-

- Give the synthesis and one application of Esomeprazole.
- Give the synthesis and one application of the Oxyphenbutazone.

Q.2

a) Answer any two of the following:-

08

- Show how enolic intermediate obtained by decarboxylation of pyruvate is converted to acetyl coenzyme A by pyruvate dehydrogenase complex.
- Give the plausible mechanism of conversion of methylmalonyl coenzyme A to succinyl coenzyme A by coenzyme B<sub>12</sub> dependent enzyme.
- Give the metabolic function and mechanism of action of biotin.
- Explain why pyridoxal phosphate is a versatile coenzyme.

04

b) Answer any one of the following:-

- Show how pyruvate is converted to acetolactate by thiamine pyrophosphate dependent acetolactate synthase.
- Match the following:-

| A                  | B                     |
|--------------------|-----------------------|
| I) TPP ylide       | a) NAD <sup>+</sup>   |
| II) Coenzyme A     | b) Flavoenzymes       |
| III) Isoalloxazine | c) Pantoic acid       |
| IV) Niacin         | d) Biological cyanide |

Q.3

a) Answer any two of the following-

08

- What is glycogen? Explain the reaction mechanism of glycogen phosphorylase.
- Giving examples show how amino acids are produced by enzymatic processes.
- Give two examples of each of the following enzyme catalyzed reactions:  
Hydroxylation and Reduction.
- Write a note on production of vitamins by enzymatic processes.

- b) Answer any one of the following:-
- Explain any one technique used for immobilization of enzymes. What are the advantages of immobilization of enzymes?
  - Explain the reaction catalyzed by UDP- glucose phosphorylase.

- Q.4 a) Answer any two of the following:-
- With reference to green chemistry, explain the use of ionic liquids for organic reactions.
  - What are biocatalysts? Why the use of biocatalysts is considered a green practice?.
  - Explain the use of 'green solvents' in green synthesis.
  - Explain the role of polymer supported reagents in green synthesis with two examples.

- b) Answer any one of the following:-

- For the synthesis of adipic acid, compare the conventional method of synthesis with the green method.
- Give the conventional and green synthesis of ibuprofen.

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

- Explain the concept of 'soft drug'. Give the properties of soft drugs.
- Give the synthesis and one application of labetalol.
- What are cytochromes? Give the structures of the reactive oxyferryl intermediate formed during oxygen activation by cytochromes.
- Explain the following terms:  
Internal aldimine, Holoenzyme and Apoenzyme
- Give any two examples of synthesis of chemicals via microbial transformation.
- With an example, explain a chemical process with an isolated enzyme in free form.
- What are the basic principles of green chemistry?
- Explain the use of microwaves in green synthesis. Why is it considered as a green method?

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