**Q.P. Code :36485**

**[Time: $2\frac{1}{2}$ 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:- **08**

i) Why are drugs converted into prodrugs? Give the structures of two prodrugs.
ii) What is meant by 'QSAR' and explain how the Taft equation helps to predict the biological activity of a drug.
iii) How is the computer aided molecular graphics used for drug design?
iv) Explain how steric effects are important for the biological activity of a drug?

b) Answer any one of the following:- **04**

i) Give the synthesis and one application of Fluoxetine.
ii) Give the synthesis and one application of Esomeprazole

**Q.2** a) Answer any two of the following:- **08**

i) Give the mechanism of transamination brought about by pyridoxal phosphate dependent enzymes.
ii) Explain oxygen activation in biological systems with reference to cytochromes.
iii) What are biomodels of coenzymes? Give one biomodel each of thiamine pyrophosphate and coenzyme $B_{12}$
iv) Give the metabolic functions of flavoenzymes.

b) Answer any one of the following:- **04**

i) Explain the synthesis of fatty acids from acetyl coenzyme A
ii) Give the name and the structure of the coenzyme involved in the following enzymatic biochemical transformations.
I) Pyruvate to acetolactate II) Acetyl coenzyme A to malonyl coenzyme A

**Q.3** a) Answer any two of the following- **08**

i) Explain the role of UDP-glucose phosphorylase in glycogen synthesis. Mention the importance of glycogen.
ii) Write a note on production of vitamins by fermentation.
iii) Give any two examples of each of the following enzyme catalyzed reactions. Hydroxylation and Hydrolysis.
iv) Explain the role of glycogen phosphorylase in glycogen breakdown.

b) Answer any one of the following:- **04**

i) Give a brief account of production of $\beta-$ lactam antibiotics by fermentation.
ii) Explain any two techniques used for immobilization of enzymes.

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**Q.4** a) Answer any two of the following:- **08**

i) Explain the principles of the use of microwaves in organic synthesis. Why is it considered as a 'green' method?
ii) Discuss the use of green reagents in organic synthesis with one example.
iii) Justify how supercritical carbon dioxide contributes to the green synthesis with one example?
iv) Explain ultrasound assisted reactions with two examples.

b) Answer any one of the following:- **04**

i) For the synthesis of benzimidazole, compare the conventional method of synthesis with the green method.
ii) Give the green synthesis of p-bromotoluene.

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

a) Explain the concept of 'soft drug' and give its properties.
b) Give the synthesis and one application of labetalol.
c) Match the following coenzymes with their metabolic functions/structural features.

| A | B |
|---|---|
| I] Thamine pyrophosphate | a) Corrin ring system |
| II] Coenzyme $B_{12}$ | b) Pantetheine |
| III] Coenzyme A | c) Transfer of two carbon fragment. |

d) Name the coenzymes in pyruvate dehydrogenase complex.
e) Give the advantages and disadvantages of immobilization of enzymes.
f) Giving an example, explain a chemical process with an isolated enzyme in free form.
g) What are the newer methods used in green chemistry with regards to energy consideration?
h) Write a note on 'green solvents.

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