[Time: 2.30 Hrs] **[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)**

i) Explain the terms: Receptor and Drug potency.
ii) Discuss the following physical and chemical parameters in drug distribution: solubility and ionization.
iii) Discuss how penicillin was discovered without a Lead.
iv) Discuss the basic idea regarding combinatorial synthesis.

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

i) Discuss homologation and chain branching, for modification of structure to increase potency and therapeutic index.
ii) Give a brief account of factors affecting bioactivity.

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

i) What is 'QSAR'? Give the Hancock modification of the Taft equation.
ii) Discuss the concept of soft drugs with its properties.
iii) Describe the modern method of drug design based on bioinformatics.
iv) Give the account of drug design via enzyme inhibition.

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

i) Give the synthesis and one application of Fenofibrate.
ii) Give the synthesis and one applications of cetirizine.

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

i) Give the biosynthesis of phenylalanine from shikimic acid.
ii) How is vanillic acid is biosynthesized from C_6C_3 builiding blocks?
iii) Give the biosynthesis of Saturated fatty acids.
iv) Outline the mevalonate pathway.

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

i) Explain the biosynthesis of Prostaglandins from arachidonic acid.
ii) Give the biosynthesis of cinnamic acid and its derivatives form prephenate.

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

i) What factors are to be considered while designing a green synthesis?
ii) Discuss solid phase synthesis with suitable examples.
iii) What are the different types of nanocatalysts with its advantages?
iv) Discuss the role of dimethylcarbonate as a green reagent in green synthesis.

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) Explain the microwave assisted organic synthesis with reference to reactions in water and solvent free conditions.

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

a) Explain the use of functional groups in prodrugs with advantages.
b) Give the synthesis of Esomeprazole with applications.
c) Define the terms: Drug assay and Therapeutic index.
d) How isomerism is important in changing the level of drug distribution in the body.
e) Explain the terms : Biogenesis and Primary metabolites.
f) Explain the pathways involved in the biosynthesis of non-essential amino acids.
g) How biocatalysts act as a green catalyst? Give two examples.
h) Write a note on magnetically separable nanocatalyst.

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