[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) Explain the terms:
A) Drug potency B) Receptor
ii) Discuss the basic pharmacokinetics in drug absorption.
iii) Discuss drug discovery of Librium without a lead.
iv) How isomerism is important in changing the level of drug distribution in the body?

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) Explain the role of bioisosterism for structure modification of a drug.

Q.2 a) Answer any two of the following: 08
i) Explain how the steric effects are important for the biological activity of a drug?
ii) Give the account of drug design via enzyme inhibition.
iii) Discuss the concept of prodrugs and give the advantages of prodrugs.
iv) What is 'QSAR'? Give the details of Hansch analysis.

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 Fenofibrate.

Q.3 a) Answer any two of the following: 08
i) Give the acetate pathway of biosynthesis of orsenillic acid.
ii) Give biosynthesis of shikimic acid.
iii) How Vanillic acid is biosynthesized from C_6C_3 building blocks?
iv) Explain biosynthesis of Flavonoids from trans-cinnamate.

b) Answer any one of the following: 04
i) Explain biosynthesis of prostaglandins from arachidonic acid.
ii) Give the biosynthesis of Farnesyl pyrophosphate from Isopentenyl pyrophosphate.

Q.4 a) Answer any two of the following: 08
i) Justify how super critical carbon dioxide contributes to green synthesis with one example?
ii) For the synthesis of benzimidazole, compare the conventional method of synthesis with green method.
iii) Give the different types of nanocatalysts with its advantages.
iv) What factors are to be considered while designing a green synthesis?

b) Answer any one of the following: 04
i) How ultrasound assisted reactions are useful in green synthesis?
ii) Discuss solid phase synthesis with suitable examples.

Q.5 Answer any four of the following: 12

a) Give the synthesis and applications of labetalol.
b) Explain the concept of 'soft drug' with its properties.
c) Discuss the idea regarding combinatorial synthesis.
d) Give the role of partition coefficient and isomerism in drug distribution and drug-receptor binding.
e) Explain the terms: primary and secondary metabolites.
f) Distinguish between Lignins and Lignans.
g) Write a note on the role of green solvents in green synthesis.
h) Write note on magnetically separable nanocatalyst.

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