

[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) Receptor B) Therapeutic index
 ii) Discuss the physical and chemical parameters solubility and ionization, in drug distribution.
 iii) Discuss how penicillin was discovered without a lead.
 iv) Discuss structure modification to increase potency and therapeutic index of a drug.
- b) Answer any one of the following: 04
 i) Give details of factors affecting bioactivity.
 ii) Discuss the basic idea regarding combinatorial synthesis.
- 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) Give the synthesis and one application of Fluoxetine.
 iv) Describe the modern method of drug design based on bioinformatics.
- b) Answer any one of the following: 04
 i) Give the synthesis and one application of cetirizine.
 ii) Discuss the methods used to correlate regression parameters with biological activity.
- Q.3 a) Answer any two of the following: 08
 i) Give the biosynthesis of saturated fatty acids.
 ii) Outline the mevalonate pathway.
 iii) Give the biosynthesis of phenylalanine from shikimic acid.
 iv) Give the steps involved in the synthesis of Orsellinic acid from acetate pathway.
- b) Answer any one of the following: 04
 i) Give the biosynthesis of cinnamic acid and its derivatives from prephenate.
 ii) Starting from Isopentenyl pyrophosphate give the biosynthetic pathway to diterpenoids.
- Q.4 a) Answer any two of the following: 08
 i) Give an account of green solvents and catalysts in designing a green synthesis.
 ii) How nanocatalyst acts as a green catalyst? Give its advantages.
 iii) Discuss the role of dimethyl carbonate as a green reagent in green synthesis.
 iv) Give the comparison of traditional as well as green process for the synthesis of ibuprofen.
- b) Answer any one of the following: 04
 i) What are the advantages of solid supported synthesis in green synthesis with suitable examples?
 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:

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- Explain the use of functional groups in prodrugs with advantages.
- Give the synthesis and application of the Esomeprazole.
- Define the terms: drug assay and drug potency.
- How isomerism is important in changing the level of drug distribution in the body?
- Explain the terms: 1) Biogenesis and
2) Primary metabolites
- Explain the pathway involved in the biosynthesis of non-essential amino acids.
- Explain the role of ionic liquids as a green solvents.
- How biocatalysts act as a green catalysts? Give two examples.
