

**Duration: 2.5 Hours**

**Max Marks: 60**

- N.B.**
- i) All questions are compulsory.
  - ii) Figures to the right indicate full marks.

1. A. Attempt **any two** of the following: **8**
  - i) Discuss how penicillin was discovered without a lead.
  - ii) Explain the use of functional groups in prodrugs with advantages.
  - iii) Discuss structure modification to increase potency and therapeutic index of a drug.
  - iv) Discuss the following physical and chemical parameters in drug distribution: solubility and ionization.

B Attempt **any one** of the following: **4**

  - i) Give details of factors affecting bioactivity.
  - ii) Discuss the basic idea regarding combinatorial synthesis.
2. A Attempt **any two** of the following: **8**
  - i) What is the utility of Taft Equation in QSAR?
  - ii) Explain the various types of prodrug.
  - iii) What is Computer Aided Drug Design? Give it's objectives and advantages.
  - iv) What is Hansch Analysis? Give the advantages and disadvantages of this analysis.

B Attempt **any one** of the following: **4**

  - i) Give synthesis and one application of Zidovudine.
  - ii) Give synthesis and one application of Diclofenac.
3. A Attempt **any two** of the following: **8**
  - i) Explain the conversion of Malonyl-CoA to Palmitate in fatty acid biosynthesis.
  - ii) Write biosynthesis of aromatic amino acid-phenylalanine by the shikimic acid route.
  - iii) Give the biosynthesis of citronellol from mevalonic acid.
  - iv) Write the steps involved in the biosynthesis of benzoic acid derivatives from cinnamic acid.

B Attempt **any one** of the following: **4**

  - i) Write a note on primary and secondary metabolites in plants.
  - ii) Give the biosynthesis of prostaglandin PGF<sub>2a</sub>.

- 4      A      Attempt **any two** of the following: **8**
- i) Write down the preparation of Wittig reagent. Give the application of Polystyrene Wittig reagent in organic synthesis.
  - ii) Give any two green Base catalyzed reactions with examples.
  - iii) Define Biocatalyst. Give any two names of biocatalyst. Write down any one example of Bio-catalyzed transformation.
  - iv) What is Deep Eutectic Solvent? Give any one reaction with examples in which Deep Eutectic Solvent is used as a green solvent.
- B      Attempt **any one** of the following: **4**
- i) Give any two example of microwave assisted reaction carried out in water.
  - ii) Write down the green synthesis of adipic acid and give its any two advantages over traditional synthesis process.
- 5           Attempt **any four** of the following: **12**
- a) Discuss the basic pharmacokinetics in drug absorption.
  - b) Define the terms: Receptor and drug potency.
  - c) Give synthesis of Flucanazole
  - d) Explain soft drug using an example. Give properties of soft drug.
  - e) What are monoterpenes? Write the biosynthesis of Geranyl pyrophosphate from IPP.
  - f) Give the biosynthesis of Shikimic Acid.
  - g) Explain in brief any three principles of Green Chemistry.
  - h) Write down the structure of 18-Crown-6. Give the application of 18-Crown-6 in organic synthesis.

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