

**FACULTY OF SCIENCE**  
**M.Sc. III-Semester Examination, December 2013**

**Subject : Organic Chemistry**  
**Paper - II : Asymmetric Synthesis, Synthetic Strategies and Hetro Cycles**

Time : 3 hours

Max. Marks : 80

**Note : Answer all questions from Part-A and Part-B. Each question carries 8 marks in Part-A and 12 marks in Part-B.**

**PART – A (4 x 8 = 32 Marks)**  
*(Short Answer Type)*

- 1.a) Explain the idea of "prochirality" with examples.
- b) What do you understand by "Topocity" in molecules?
- 2.a) Discuss Sharpless epoxidation using a chiral catalyst.
- b) Write about enzyme-mediated enantioselective synthesis.
- 3.a) Discuss the concept of functional group elimination in organic synthesis.
- b) State and explain the addition of hydroxylamine to benzylideneacetophenone.
- 4.a) Outline a simple synthesis of pyrimidine.
- b) Explain the reactivity of imidazoles.

**PART – B (4 x 12 = 48 Marks)**  
*(Essay Answer Type)*

- 5.a) Discuss the symmetry and transition-state criteria for stereoselectivity in reactions.
  - b) Describe the use of chiral HPLC in separation and determination of enantiomeric mixtures.
- OR**
- c) Explain the kinetic versus thermodynamic control criteria for selectivity in chemical reactions giving examples.
  - d) Write a note on use of chiral NMR in analysis of reaction product mixtures.
- 6.a) Discuss the  $\alpha$ -alkylation of chiral enolates.
  - b) What are asymmetric hydroborations? Explain the use of  $IPC_2BH$  and  $IPCBH_2$  in these reactions.
- OR**
- c) Describe nucleophilic additions to chiral carbonyl compounds. Explain Cram's rule and Felkin-Ann model.
  - d) Explain the use of chiral auxiliaries in Diels-Alder and Cope reactions
- 7.a) Discuss linear and convergent synthesis with examples.
  - b) Describe "Synthesis Umpoling" with examples.
- OR**
- c) What are one group and two group C-X disconnections? Explain with examples.
  - d) Describe the synthesis of Disparluse by retrosynthetic approach.
- 8.a) Explain the aromatic character of 1, 3 and 1, 2 – Azoles.
  - b) Discuss the syntheses and reactivity of thiazoles.
- OR**
- c) Explain the reactivity of pyrimidines towards nucleophiles and resistance to electrophilic aromatic substitutions.
  - d) Outline one synthesis each for imidazoles and oxazoles.

\*\*\*\*\*