

## ORGANIC CHEMISTRY - II

### Semester - I

Time Allowed : 3 Hours]

[Maximum Marks : 26

Note : Candidates are required to attempt two questions each from Section A and B and the entire Section C consisting of 5 short answer type questions carrying 2 marks each.

#### Section - A

1. (a) State Huckel' rule of Aromaticity.
- (b) O-nitrophenol has low melting point than P-nitrophenol. Explain. 1,1,2
- (c) Explain Electromeric effect with examples. 1,1,2
2. (a) What are free Radicals ? Explain why tert-butyl free radical is more stable than isopropyl free radical.
- (b) Assign formal charge on methyl carbocation and methyl carbanion using average electron theory. 2,2
3. (a) What do you understand by electrophilic addition and nucleophilic addition reactions ? Give examples. 2,2
- (b) How does isotopic labelling help in predicting mechanism of a reaction ? 2,2
4. (a) Discuss Wurtz reaction for preparation of alkanes. What are its limitations ? 2,2
- (b) Discuss relative reactivity of halogens with alkanes in halogenation reactions. 2,2

#### Section - B

5. (a) Explain :
  - (i) Ring strain in cyclopropane and cyclobutane.

- (ii) Why cycloalkanes with larger rings are not easily formed?
- (b) How will you convert : 2,2
- (i) Cyclobutane to 1-bromobutane
- (ii) Cyclopropane to propane.
6. (a) Explain clearly with suitable examples :
- (i) Chiral centre
- (ii) Plane of symmetry.
- (b) What are E and Z isomers. Assign E or Z configuration to following compounds :
- (i)  $\begin{array}{c} \text{H}_5\text{C}_2 \\ \diagdown \\ \text{C} = \text{C} \\ \diagup \\ \text{H}_3\text{C} \end{array} \begin{array}{c} \diagup \\ \text{CH}_3 \\ \diagdown \\ \text{H} \end{array}$
- (ii)  $\begin{array}{c} \text{CH}_3 \\ \diagdown \\ \text{C} = \text{C} \\ \diagup \\ \text{H} \end{array} \begin{array}{c} \diagup \\ \text{H} \\ \diagdown \\ \text{CHO} \end{array}$
- (iii)  $\begin{array}{c} \text{Br} \\ \diagdown \\ \text{C} = \text{C} \\ \diagup \\ \text{I} \end{array} \begin{array}{c} \diagup \\ \text{OH} \\ \diagdown \\ \text{Cl} \end{array}$
- (iv)  $\begin{array}{c} \text{I} \\ \diagdown \\ \text{C} = \text{C} \\ \diagup \\ \text{Br} \end{array} \begin{array}{c} \diagup \\ \text{C}_2\text{H}_5 \\ \diagdown \\ \text{NHCH}_3 \end{array}$
7. (a) Which is more stable and why :
- (i) Gauche or Anti conformation of n-butane
- (ii) Boat or chair conformation of cyclohexane.
- (b) Explain Threo and Erythro diastereomers giving examples. 2,2
8. (a) Write short notes on :
- (i) Asymmetric synthesis (ii) Walden inversion.
- (b) What do the symbols R and S specify? Give Newman projection formula for (2S, 3R) - 3 bromobutan-2-ol 2,2

### Section - C

9. Explain in short :
- (a) What are Delocalised Bonds? Give example.
- (b) Ethyl amine is more basic than Acetamide. Why?
- (c) Name the type of isomerism shown by each of the following pairs :
- (i) Propanone, Propanol (ii) Ethanoic Acid, Methyl Methanoate.
- (d) What are the advantages of E-Z system over Cis-trans system?
- (e) How will you convert Racemic Lactic Acid into optically active compound? 2×5=10