

November 2025
M.Sc.
First Semester
CORE – 02
CHEMISTRY
Course Code: MCHC 1.21
(Organic Chemistry - I)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Write a short note on the following terms:
 - (i) Resolution 4
 - (ii) Optical purity 3
- (b) Explain R,S-system of nomenclature of optically active compounds. 7

2. (a) Write a short note on the following terms: 3×2=6
 - (i) Racemic modification
 - (ii) Polar addition reaction to alkene
- (b) Write the conformations of the following compounds:
 - (i) Halopropane 3
 - (ii) Disubstituted cyclohexane 5

UNIT-II

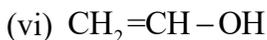
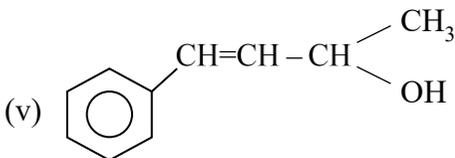
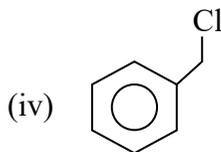
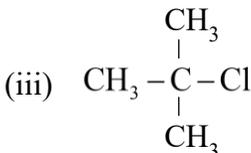
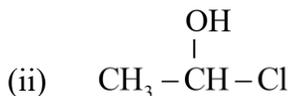
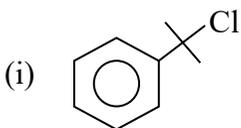
3. (a) With an example, discuss the effect of anchimeric assistance on the rate of substitution reaction. 4
- (b) Complete the following reactions and give their mechanism. 3×2=6
 - (i) $\text{CH}_3\text{-CH}_2\text{-Mg-Br} + \text{R-OH} \longrightarrow$
 - (ii) $\text{R}'\text{-X} + \text{R-SH} \longrightarrow$
- (c) Explain the effect of temperature, substrate, and solvent medium towards substitution reaction. 4

4. (a) Discuss the role of σ bonds as a neighbouring group in nucleophilic substitution reactions. 4

- (b) Discuss on Taft equation. 3
 (c) Explain the different types of aromatic nucleophilic substitution reaction. 7

UNIT-III

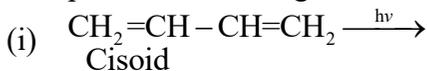
5. (a) Explain the different type of β -elimination reactions with detailed reaction mechanism. 9
 (b) Write a note on the stereochemistry of erythro isomer of 1-chloro-1,2-diphenyl propane. 5
6. (a) Discuss in detail the stereochemical aspects of E_2 -elimination reaction in acyclic compound having one chiral centre. 10
 (b) Arrange the following compounds in increasing order of their reactivity towards E_1 -reaction. Give reasons to support your answer. 4



UNIT-IV

7. (a) Explain the following reactions with suitable examples: 3
 (i) Norrish type-I reaction 3
 (ii) Norrish type-II reaction 4
 (iii) Photo-reduction of benzophenone 4

(b) Complete the following reaction: 1½×2=3

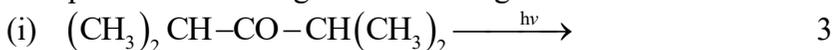


8 (a) Explain the following reactions mechanism with suitable example:

(i) Hofmann-Löffler-Freytag reaction 4

(ii) Barton reaction 7

(b) Complete the following reactions and give mechanism:



UNIT-V

9. (a) Explain electrocyclic reaction of 1,6-disubstituted-1,3,5-hexatriene by FMO approach. 6

(b) Explain the mechanism of Sommelet-Hauser rearrangement reaction with suitable example. 4

(c) Explain 1,5-sigmatropic hydrogen shift by FMO approach taking a suitable example. 4

10. (a) Explain Claisen and thio-Claisen reaction with mechanism. 4

(b) Write cyclo addition reaction of hexatriene with butadiene and indicate the mode of reaction. 7

(c) Explain 1,3-dipolar cycloaddition reaction of azomethine imines with ethylene. 3