

October 2025
B.A./B.Sc.
Third Semester
MINOR – 3
CHEMISTRY
Course Code: CHN 3.11
(Basic & Hydrocarbon)

Total Mark: 50
Time: 2 hours

Pass Mark: 20

I. Answer the following questions.

UNIT-I

1. (a) Write the IUPAC name for the following compounds: 1×3=3
- (i) $\text{H}_2\text{C}=\text{C}(\text{CH}_3)-\text{CH}=\text{CH}_2$
- (ii) $\text{CH}_3\text{CH}=\text{CH}-\text{CH}=\text{O}$
- (iii) $\text{HOOC}-\text{COOH}$
- (b) Define hybridisation. Briefly illustrate sp^3 hybridisation with an example. 1+3=4
- (c) The reactivity order of alkyl halides towards $\text{S}_{\text{N}}1$ follows the order $3^\circ > 2^\circ > 1^\circ$. Give reason. 3
- (d) Define the terms: 1×2=2
- (i) Mesomeric effect (ii) Electromeric effect

UNIT-II

2. (a) Complete the following reactions: 1½+1½=3
- (i) $2\text{CH}_3-\text{Br} + 2\text{Na} \xrightarrow{\text{ether}} \longrightarrow$
- (ii) $\text{CH}_2=\text{CH}_2 + \text{H}_2 \xrightarrow{\text{Ni}} \longrightarrow$
- (b) What is Diels-Alder reaction? Give example. 2
- (c) Briefly outline the reaction mechanism of halogenation of methane. 4
- (d) Show one example each of 1, 2 addition and 1, 4 addition reaction in conjugated dienes. 3

UNIT-III

3. (a) Explain Baeyer strain theory of cycloalkanes. What are its limitations? 4+2=6
- (b) State Huckels rule. Apply Huckels rule to explain why benzene is aromatic. 1+2=3
- (c) Alkynes undergo both electrophilic and nucleophilic substitution reactions. Discuss with suitable examples and mechanisms. 3

II. Answer any two of the following questions.

4. (a) Define electrophiles and nucleophiles with examples. 3
- (b) Give reasons for the following statements: 2×2=4
- (i) Chloroacetic acid is stronger acid than acetic acid.
- (ii) Benzyl carbocation is more stable than propyl carbocation.
5. Explain the following reaction with mechanism: 3½×2=7
- (a) Hydroboration-oxidation of alkene.
- (b) Ozonolysis of alkene
6. (a) With a neat diagram, show the relative energy levels of different conformation of cyclohexane. 2
- (b) Compare the acidity of alkanes, alkenes, and alkynes with suitable reasons. 3
- (c) Give one example each of a non-aromatic and an anti-aromatic compound. 2
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