# GOVT. P.G. COLLEGE FOR WOMEN, PANCHKULA

## Session 2020-2021 (ODD SEMESTER)

Name of Professor: **Dr. Rajni Mohil**
Designation: **Assistant Professor**
Subject/Paper**: Organic Chemistry/Paper-III (CH-103)**
Class: **BSc-I**

| SR. NO. | MONTH | TOPICS TO BE COVERED | REMARKS IF ANY |
|---|---|---|---|
| 1. | OCTOBER | **Structure and Bonding**<br>Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison. | |
| 2. | NOVEMBER | **Stereochemistry of Organic Compounds** Concept of isomerism. Types of isomerism. Optical isomerism — elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, R & S systems of nomenclature. Geometric isomerism — determination of configuration of geometric isomers. E & Z system of nomenclature, Conformational isomerism — conformational analysis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman projection and Sawhorse formulae, Difference between configuration and conformation | ASSIGNMENT 1 |

| 3. | DECEMBER | **Mechanism of Organic Reactions** <br><br> Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Reactive intermediates —— carbocations, carbanions, free radicals, carbenes,(formation, structure & stability). <br><br> **Alkanes** <br><br> IUPAC nomenclature of branched and unbranched alkanes, classification of carbon atoms in alkanes. Isomerism in alkanes, sources, methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity. | **ASSIGNMENT 2** |
| :-- | :-- | :-- | :-- |
| 4. | JANUARY | **Cycloalkanes** <br><br> nomenclature, synthesis of cycloalkanes and their derivatives – photochemical (2+2) cycloaddition reactions, , dehalogenation of $\alpha,\omega$-dihalides, , pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations., theory of strainless rings. <br><br> **REVISION** | **UNIT TEST** |

Signature

## Session 2020-2021 (ODD SEMESTER)

Name of Professor: **Dr. Rajni Mohil**
Designation: **Assistant Professor**
Subject/Paper**: Organic Chemistry/Paper-III (CH-103)**
Class: **BSc-I**

| SR. NO. | MONTH | TOPICS TO BE COVERED | REMARKS IF ANY |
|---|---|---|---|
| 1. | OCTOBER | **Structure and Bonding**<br>Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison. | |
| 2. | NOVEMBER | **Stereochemistry of Organic Compounds** Concept of isomerism. Types of isomerism. Optical isomerism — elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, R & S systems of nomenclature. Geometric isomerism — determination of configuration of geometric isomers. E & Z system of nomenclature, Conformational isomerism — conformational analysis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman projection and Sawhorse formulae, Difference between configuration and conformation | ASSIGNMENT 1 |

| 3. | DECEMBER | **Mechanism of Organic Reactions** Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Reactive intermediates — carbocations, carbanions, free radicals, carbenes,(formation, structure & stability). **Alkanes** IUPAC nomenclature of branched and unbranched alkanes, classification of carbon atoms in alkanes. Isomerism in alkanes, sources, methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity. | **ASSIGNMENT 2** |
| 4. | JANUARY | **Cycloalkanes** nomenclature, synthesis of cycloalkanes and their derivatives – photochemical (2+2) cycloaddition reactions, , dehalogenation of $\alpha,\omega$-dihalides, , pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations., theory of strainless rings. **REVISION** | **UNIT TEST** |

Signature