**TEACHING LESSON PLAN**

Class-\_\_\_\_\_\_\_\_\_\_\_\_\_ Subject-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester:-\_\_\_\_\_\_\_1st sem\_\_\_\_\_\_\_\_\_\_\_

Name Of Faculty:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Session:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| MONTH |  |
| **JULY** | **Structure and Bonding**Localized and delocalized chemical bond, van der Waals in teractions, resonance: conditions |
|  **AUGUST** | resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison. 2. **Stereochemistry of Organic Compounds-I** 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.TEST-1 |
| **SEPTEMBER** | **Stereochemistry of Organic Compounds-II** 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.**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.TEST-2 |
| **OCTOBER** | Types of organic reactions. Energy considerations. Reactive intermediates carbocations, carbanions, free radicals, carbenes , arynes and nitrenes (formation, structure & stability). Assigning formal charges on intermediates and other ionic species.**Alkanes and Cycloalkanes** IUPAC nomenclature of branched and unbranched alkanes , the alkyl group, classification of carbon atoms in alkanes. Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties. Cycloalkanes nomenclature, synthesis of cycloalkanes and their derivatives – photochemical (2+2) cycloaddition reactions, dehalogenation of -dihalides, pyrolysis of calcium or barium salts of dicarboxylic acidsTEST-3 |
| **NOVEMBER** | Baeyer's strain theory and its limitations., theory of strainless ringsTEST-4 REVISION |

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Class-\_\_\_\_\_\_\_\_\_\_\_\_\_ Subject-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester:-\_\_\_\_\_\_\_\_\_3rd sem.\_\_\_\_\_\_\_\_\_

Name Of Faculty:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Session:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| MONTH |  |
| **JULY** | **1.Alcohols** Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. |
|  **AUGUST** | Hydrogen bonding. Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc)4 and HIO4 ] and pinacol-pinacolone rearrangement**2. Epoxides** Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxidesTEST-1 |
| **SEPTEMBER** | **Phenols** Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe’s reaction and Schotten and Baumann reactions.**Ultraviolet (UV)** absorption spectroscopy Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochromeTEST-2 |
| **OCTOBER** | Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones,Woodward- Fieser rules, calculation of max of simple conjugated dienes and , -unsaturated ketones. Applications o f UV Spectroscopy in structure elucidation of simple organic compounds.**Carboxylic Acids & Acid Derivatives** Nomenclature of Carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids. Mechanism of decarboxylation. Structure nomenclature and preparation of acid chlorides, esters, amides and acid anhydridesTEST-3 |
| **NOVEMBER** | Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic)TEST4REVISION |

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**TEACHING LESSON PLAN**

Class-\_\_\_\_\_\_\_\_\_\_\_\_\_ Subject-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Semester:-\_\_\_\_\_\_\_\_\_\_\_5th sem.\_\_\_\_\_\_\_

Name Of Faculty:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Session:-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| MONTH |  |
| **JULY** | **NMR Spectroscopy-I** Principle of nuclear magnetic resonance, the PMR spectrum,number of signals |
|  **AUGUST** | peak areas, equivalent and nonequivalent protons positions of signals and chemical shift,shielding and deshielding of protons, proton counting,splitting of signals and coupling constants, magnetic equivalence of protons.**NMR Spectroscopy-II** Discuss ion of PMR spectra of the molecules: ethyl bromide, npropyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone+ TEST |
| **SEPTEMBER** | Simple problems on PMR spectroscopy for structure determination of organic compounds**Carbohydrates-I** Classification and nomenclature. Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose in to mannose. Formation of glycosides, ethers and esters. + TEST |
| **OCTOBER** | Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism ofmutarotation. Structures of ribose and deoxyribose.**Carbohydrates-II** An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.**Organometallic Compounds**Organomagnesium compounds: the Grignard reagents-formation, structure and chemical reactions+ TEST |
| **NOVEMBER** | Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions+ TEST +REVISION |

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