

Summary of lesson plan of college faculty

Semester: ODD

Class: B.Sc. 1st Year

Subject: Chemistry

For the Month of: August to December, 2023

Name of Assistant Professor: Mrs. Jyoti

Sr. No.	Month	Topic to be Covered	Academic Activities /Assignments/Test
1.	August	Definition of transition elements, position in periodic table, general characteristics & properties of 3d element with 4d & 5d elements with reference to only ionic radii, oxidation state, Magnetic & spectral properties & stereochemistry stability of various oxidation state. And structure and properties of some compounds of transition elements: TiO_2, VOCl_2, FeCl_3, CuCl_2, $\text{Ni}(\text{Co})_4$ Coordination compound: Werner coordination theory of coordination compound effective atomic No., chelates, Nomenclature of coordinations, isomerism coordination compounds. Valence bond theory of transition metal complexes.	Test of coordination compound
2.	September	Non aqueous solvent: Physical properties of solvents, types of solvents and their general characteristics rxn in non- aqueous solvent with reference to liquid NH_3 and liquid SO_2. Alcohols: Monohydric alcohol - nomenclature, Methods of formation by reduction of aldehyde, Ketones, carboxylic acids and esters. Hydrogen bonding. Acidic Nature Reactions of Alcohols. Dihydric Alcohols- Nomenclature, methods of formation, chemical rxn, oxidative cleavage and Pinacol-Pinacolone rearrangement Phenol: Nomenclature, structure and bonding, preparation of phenols, Physical properties and acidic character. Comparative acidic strength of alcohol and phenols, resonance.	Assignment of Phenol

3.	October	Stabilisation of phenoxide ion. Rxn of Phenols - electrophilic aromatic substitution, mechanism of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann rxn Kolbe's reaction and Schotten-Baumann rxn Epoxides: synthesis of epoxides, Acid and Base catalysed ring opening of epoxides orientation of epoxide ring opening rxn of Grignard and organolithium reagents with epoxide UV (Ultraviolet) absorption spectroscopy: Absorption Laws (Beer-Lambert law), Molar absorptivity, presentation and analysis of UV spectra, types of electronic transition, effect of conjugation, concept of chromophore and auxochrome. Bathochromic, Hypsochromic, Hyperchromic & Hypochromic Shifts	One-day workshop on the topic "ISRO contribution to space, science and exploration"
4.	November	Application of UV spectra in structure elucidation of simple organic compounds. Carboxylic acids and 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, rxn of carboxylic acids. Hell-Volhard-Zelinsky rxn. Reduction of carboxylic acids. Mechanism of decarboxylation. Relative stability of acyl derivatives, physical properties, inter-conversion of acid derivatives, by nucleophilic acyl substitution. Mechanism of esterification and hydrolysis (acidic and basic)	Assignment on topic carboxylic acid.
5.	December	Thermodynamics: system, surrounding etc. Types of systems, intensive and extensive properties. State and partition function and the differential thermo process, first law of thermodynamics, heat capacity Joule Thomson coefficient, chemical equation, free energy, concept of chemical potential Clausius-Clapeyron equation and its applications. Distribution law: Nernst distribution law, (i) determination degree of distribution (ii) determination of equation, constant (iii) process of extraction Revision of physical chemistry	

Summary of lesson plan of college faculty

Semester: ODD

Class: B.Sc. 1st Year

Subject: Chemistry (Minor)

For the Month of: August to December, 2023

Name of Assistant Professor: Mrs. Jyoti

Sr. No.	Month	Topic to be Covered	Academic Activities /Assignments/Test
1.	August	Covalent leond: Valence leond theory approach, shapes of simple inorganic molecules and ions leased on valence shell electron pair repulsion (VSPER) theory and hybridization with suitable example of linear, trigonal planner, square planner, tetrahedra, trigonal bipyramidal and octahedral arrangement. Molecular orbital theory of Homonuclear (N ₂ , O ₂) and heteronuclear (Co and No) diatomic molecules, dipole moment and Percentage ionic character in covalent bond	Test of covalent bond Assignment of covalent bond
2.	September	Chemical kinetics - concept of reaction rates, rate, equation, factor influencing the rate of reaction, order and molecularity of reaction Integrated rate expression 40, so first, second order reaction (for equal concentrations), half-life period of a reaction.	Test of chemical kinetics

3.	October	Alkanes (up to 5 carbon atoms) Alkanes, nomenclatures, classification of carbon atoms in Alkanes, Isomerism in alkanes, sources method of formation: - Wurtz reaction, Kolbe reaction, Corey House reaction and decarboxylation of carboxylic acids, physical properties, mechanism of free radical halogenation of alkanes: reactive selective	One-day workshop on the topic "ISRO contribution to space, science and exploration Assignment of alkanes
4.	November	Metallic bond and semiconductors : metallic bond- quantitative idea of Valence bond and band theories of metallic bond. Conductor, semiconductor, insulator semiconductor: introduction, types of semiconductors, and application of semiconductor	Test of metallic bond and semiconductor
5.	December	Revision of chapter Alkanes and metallic bond and semiconductor	

Summary of lesson plan of college faculty

Semester: ODD

Class: B.Sc. 3rd Year

Subject: Chemistry (Theory)

For the Month of: August to December, 2023

Name of Assistant Professor: Ms. Jyoti

Sr. No.	Month	Topic to be Covered	Academic Activities /Assignments/Test
1.	August	Metal-Ligand Bonding in Transition Metal complexes: limitations valence bond theory, an elementary idea of crystal field theory. Thermodynamics and kinetic aspects of metal complexes: outline of thermodynamics stability of metal complexes Factor affecting the stability Troin- William series, substitution reaction of square planner complex. Magnetic properties of transition, metal complexes: types of magnetic material, magnetic, susceptibility. Method of determining, magnetic, suspect ability, spin only for formula L-S coupling, relation of μ_s & μ_{eff}	Test of chapter 1 Metal- ligand bonding in transition- metal complexes
2.	September	Electronic spectra of transition metal complexes: selection rules for d-d transition, Orgel energy level diagram for d1 and d9 states. Organic Chemistry: NMR spectroscopy, Principle of nuclear magnetic resonance, the PMR spectrum, number of signals, peak areas. Discussion of PMR spectra of molecules, simple problem on PMR spectroscopy for structure determination. Carbohydrates: Classification and nomenclature, Mechanism of osazone formation. Interconversion of glucose & fructose. Chain lengthening and chain shortening of aldoses.	Assignment of NMR spectroscopy

3.	October	Determination of ring sizes of glucose and fructose. Open chain and cyclic structure of D(+) - glucose & D(-) fructose. Mechanism of mutarstation. structures of ribose and deoxyribose. Organometallic compounds: Organomagnesim compounds: The Grignard reagents. Organozine compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions.	One day workshop on the topic "ISRO contribution to space, science and exploration
4.	November	Quantum Mechanies - I. Black-body radiation, Hamiltonian operator, Hermitian operator, Quantum mechanical operators, Planck's radiation law. Physical properties and Molecular structure: optical activity, polarisation, induced dipole moment. Magnetic, permeability, magnetic, susceptibility. Spectroscopy: Electiomagnetic radiation, regions of spectrum, Rotational spectrum: Selection rules, Energy levels of rigid rotator. Vibrational spectrum: selection rules, Energy levels of simple harmonic oscillator idea of vibration frequency. Raman spectrum: Concept of polarizibility, pure rotational and pure vibrational Raman spectra of diatomic molecules.	Assignment on quantum mechanics
5.	December	Revision of NMR spectroscopy. Revision of quantum mechanics -I, physical properties and molecular structure	