**MONTHLY LESSON PLAN**

**B.SC. 6TH SEMESTER**

**SUBJECT: CHEMISTRY, SESSION 2023-24**

|  |
| --- |
| **CMG GCW BHOIA KHERA, FATEHABAD** |
| **NAME OF THE ASSISTANT PROFESSOR** | **MR. SATISH CHANDER** |
| **CLASS AND SECTION:** | **BSC III rd 6TH SEMESTER** |
| **SUBJECT:** |  **CHEMISTRY** |
| **NOMENCLATURE:** | **PHYSICAL CHEMISTRY** |
| **MONTH** | **TOPICS** |
| **01 JANUARY 2024** | **ELECTRONIC SPECTRUM**Concept of potential energy curve for bonding and antibonding molecular orbitals, qualitative description of selection rules and Frank- Condon principle. Qualitative description of sigma and pi and n molecular orbital (MO) their energy level and respective transitions. |
| **FEBERARY 2024** | **Photochemistry**: Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Drapper law, StarkEinstein law (law of photochemical equivalence), Jablonski diagram depiciting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples).REVISION AND DOUBTS TEST ASSIGNMENT  |
| **MARCH 2024** |  **Solutions**: Dilute Solutions and Colligative Properties Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult’s law. Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure. Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point. |
| **APRIL 2024** | **Solutions**: Applications in calculating molar masses of normal dissociated and associated solutes in solution.**Phase Equillibrium**: Statement and meaning of the terms – phase, component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water system. Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilverisation of lead.REVISION AND DOUBTS: COMPLETE SYLLABUSREVISION WORK |

**MONTHLY LESSON PLAN**

**B.SC. 4TH SEMESTER**

**SUBJECT: CHEMISTRY, SESSION 2023-24**

|  |
| --- |
| **CMG GCW BHOIA KHERA, FATEHABAD** |
| **NAME OF THE ASSISTANT PROFESSOR** | **MR. SATISH CHANDER** |
| **CLASS AND SECTION:** | **BSC IInd 4TH SEMESTER** |
| **SUBJECT:** | **CHEMISTRY** |
| **NOMENCLATURE:** | **PHYSICAL CHEMISTRY** |
| **MONTH** | **TOPICS** |
| **01 JANUARY 2024** |  **Thermodynamics:** Second law of thermodynamics, need for the law, different statements of the law, Carnot’s cycles and its efficiency, Carnot’s theorm, Thermodynamics scale of temperature. |
| **FEBERARY 2024** |  **Thermodynamics:** Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as a criteria of spontaneity and equilibrium. Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, G as criteria for thermodynamic equilibrium and spontaneity, its advantage over entropy change. Variation of G with P, V and T.REVISION AND DOUBTS TEST ASSIGNMENT  |
| **MARCH 2024** |  **Electrochemistry**: Electrolytic and Galvanic cells – reversible & irreversible cells, conventional representation of electrochemical cells. Calculation of thermodynamic quantities of cell reaction (▲G, ▲H & K). Types of reversible electrodes – metal- metal ion, gas electrode, metal –insoluble salt- anion and redox electrodes.  |
| **APRIL 2024** |  **Electrochemistry**: Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrode potential, sign conventions, Concentration cells with and without transference, liquid junction potential and its measurement. Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode. More stress on numerical problems.REVISION AND DOUBTS: COMPLETE SYLLABUSREVISION WORK  |

**MONTHLY LESSON PLAN**

**B.SC. 2nd SEMESTER**

**SUBJECT: CHEMISTRY, SESSION 2023-24**

|  |
| --- |
| **CMG GCW BHOIA KHERA, FATEHABAD** |
| **NAME OF THE ASSISTANT PROFESSOR** | **MR. SATISH CHANDER** |
| **CLASS AND SECTION:** | **BSC Ist 2ND SEMESTER** |
| **SUBJECT:** | **CHEMISTRY** |
| **NOMENCLATURE:** | **ORGANIC CHEMISTRY** |
| **MONTH** | **TOPICS** |
| **01 JANUARY 2024** |  **Alkenes**: Nomenclature of alkenes, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halide. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. |
| **FEBERARY 2024** | **Alkenes** : Mechanisms involved in⎯Chemical reactions of alkenes hydrogenation, electrophilic and free radical additions, Markownikoff’s rule, hydroboration–oxidation, oxymercurationreduction, ozonolysis, hydration, hydroxylation and oxidation with KMnO4 . **Arenes and Aromaticity** : Nomenclature of benzene derivatives: Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti-aromatic and non-aromatic compounds.REVISION AND DOUBTS TEST ASSIGNMENT |
| **MARCH 2024** | **Arenes and Aromaticity** : General pattern of the⎯Aromatic electrophilic substitution mechanism, mechansim of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation.  **Dienes and Alkynes** : Nomenclature and classification of dienes: isolated, conjugated and ⎯cumulated dienes. Structure of butadiene. Chemical reactions 1,2 and 1,4 additions (Electrophilic & free radical mechanism), Diels-Alder reaction, Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation of alkynes.  |
| **APRIL 2024** | **Alkyl and Aryl Halides**: Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides, S N2 and S N1 reactions with energy profile diagrams. Methods of formation and reactions of aryl halides, The addition elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halidesREVISION AND DOUBTS: COMPLETE SYLLABUSREVISION WORK  |