# GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

**Summary of Lesson Plans of College Faculty for Academic Session 2025-26**

**Name of Assistant Professor:** RAJESH KUMAR

**Class & Sem.:** B.Sc., 5th Sem **Subject:** CHEMISTRY (Inorganic)

| Months | Topics/Chapters to be covered |
|---|---|
| **August 2025** | Metal-Ligand Bonding in Transition metal Complexes. Limitations of valence Bond Theory, an elementary idea of crystal-field Theory, crystal field splitting in octahedral, Tetrahedral and square Planar complexes, factors affecting the crystal-field parameters. Preparation for the Test. |
| **September 2025** | Thermodynamic and kinetic Aspects of Metal Complexes. A brief Outline of thermodynamic stability of metal complexes and factors affecting the stability substitution reactions of square Planar complexes of Pt(II, IV). Preparation Assignment |
| **October 2025** | Magnetic Properties of Transition metal Complexes. Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula, L-S coupling, correlation of $\mu_s$ and $\mu_{eff}$ values, Orbital contribution to magnetic moments, application of magnetic moment data for 3d metal Complexes. Preparation for the unit Test |
| **November 2025** | Electronic Spectra of Transition Metal Complexes: Types of electronic transitions, selection rules of d-d transitions, spectroscopic ground state, spectrochemical series, orgel-energy level diagram for $d^1$ and $d^9$ states, discussion of the electronic spectra of $[Ti(H_2O)_6]^{3+}$ complexes. Revision for the Exam. |

Signature of Assistant Professor

# GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

**Summary of Lesson Plans of College Faculty for Academic Session 2025-26**

**Name of Assistant Professor:** RAJESH KUMAR

**Class & Sem.:** B.Sc. Life/Physical Science 1st sem **Subject:** CHEMISTRY

| Months | Topics/Chapters to be covered |
|---|---|
| JULY/ August 2025 | Ionic Bond, lattice Energy, Born- Haber cycle and its applications, Fajan's rules, hydration Energy, Dipole moment and percentage ionic character, Resonance and resonance effect Study of some organic and inorganic comps., Molecular orbital approach:- LCAO method, Bonding and antibonding MO. and their characteristics for s-s, s-p and p-p combination of A.O. M.Orbital Diagram for homonuclear and heteronuclear ($CO$, $NO^+$, $CN^-$) molecules. Diff b/w VB and MO Approach Test for the unit. |
| September 2025 | Oxides and the structures of oxides of N, P, Oxyacids - structure and relative acid strengths of oxyacids of N and P. Structure of white, Yellow and red Phosphorous. Oxyacids of sulphur - structure and acidic strength. $H_2O_2$ - structure, preps and uses. Basic properties of halogen, interhalogen comps - Types and Preps. Halogen acids and oxyacids of chlorine - structure and comparison of acidic strength Acid/Bases - Bronsted-lowry concept, Lewis concept, Lux-Flood concept and classification of Acids and Bases and also Preparation Assignment for the unit. |
| October 2025 | Gaseous state - Maxwell distribution of velocities and energies, r.m.s., average, most probable velocity, collision diameter, collision no., frequency, mean free path. deviation of real gases from ideal behaviour, derivation of vander waal eqn. of state, explanation of behaviour of real gases using vander Waals equation. Critical Phenomenon $V_c$, $P_c$, $T_c$ and their determination, PV - Isotherms of real gases, continuity of state, isotherms of van-der-waals eqn. relationship b/w critical constants and vanderwaal Constant, compressibility factor Test for unit. |
| November 2025 | Electronic displacement and its applications, $R^n$ intermediates, concept of aromaticity, isomerism its types, optical isomerism and optical activity, elements of symm., molecular chirality, enantiomers, stereogenic centre, Prop. of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, Threo and erythro, meso, resolution, retention and racemization. Relative and absolute Configuration, sequence rule, R and S System of Nomenclature. Revision for Exam. |

Signature of Assistant Professor