**Govt. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA**

**LESSON-PLAN (Session 2020-21) ODD SEMESTER**

**Name of Professor**: Dr.Rani Jindal

**Designation: Assistant professor**

**Subject: Chemistry**

**Class:B.Sc 3rd  ( 5th sem) Medical & Nonmedical**

**Subject/Paper: Inorganic Chemistry**

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| **Sr. No.** | **Months** | **Topics to be covered** | **Remarks if any,** |
| **1** |  **August**  | **Metal- Ligand Bonding in Transition Metal complexes:**Limitations of valence bond theory, an elementary idea of crystal field theory,crystal field splitting in octahedral. **Metal- Ligand**  |  |
| **2** | **September** | **Bonding in Transition Metal complexes**Tetrahedral and square planer complexes,factors affecting the crystal field parameters.**Thermodynamics and Kinetic Aspects of metal complexes**:A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, Irving William Series, substitution reactions of square planer complexes of Pt[II], Trans effect. | Assignment and Test |
| **3** | **October**  | **Magnetic properties of Transition metal complexes:**Types of magnetic materials, magnetic susceptibility, method of determiningmagnetic susceptibility, spin only formula,L-S coupling, correlation of μs and μeff values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes. | **Assignment and Test** |
| **4** | **November** | **Electronic spectra of Transition metal complexes:**Selection rules for d-d transition, spectroscopic ground states, spectrochemical series,orgel energy level diagram for d1 and d9 states.Discussion of electronic spectrum of [Ti(H2O)6]+3 complex ion.**Revision And Test** | **Unit- Test**  |

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| **Sr. No.** | **Months** | **Topics to be covered** | **Remarks if any,** |
| **1** | **October**  | **Atomic Structure:** Idea of de Broglie matter waves, Heinsenberg’s uncertainty principle,  |  |
| **2** | **November**  | atomicorbitals, quantum numbers, radial and angular wave functions, normal andorthogonal wave functions, significance of Ψ and Ψ2 **Atomic Structure:**Probability distribution curves,shapes of s,p,d,f orbitals,Aufbau and Pauli exclusion principles,Hund’s multiplicity rules, Electronic configuration of elements,effective nuclear charge,Slater’rule.**Periodic table and atomic properties: :** Classification of periodic table into s, p, d, f blocks, atomic and ionic radii,Ionisation energy, electron affinity and electronegativity definition, methods ofdetermination or evaluation, trend in periodic table (in s and p-block elements),Pauling , Mulliken, Allred Rachow and Mulliken Jaffe’s electronegativity scale,Sanderson’s electron density ratio | Assignment and Test |
| **3** | **December** | **Covalent Bond:** Valence bond theory (Heitler-London and Pauling approach) and its limitation,directional characteristics of covalent bond, various type of hybridisation andshapes of simple inorganic molecules and ions (BeF2, BF3, CH4, PF5, SF6, IF7,SO4-2, ClO4-1, NO3-1) valence shell electron pair repulsion (VSEPR) theory to NH3,H3O+, SF4, ClF3, H2O, SnCl2, ClO3-1 and ICl2-1. Molecular orbital theory of homonuclear (N2, O2) heteronuclear (CO and NO) diatomic molecules and ions,bond energy, bond angle, bond length and dipole moments, percentage ionic character from dipole moment and electronegativity difference. | **Assignment and Test** |
| **4** | **January** | **Ionic Solids:** Ionic structures (NaCl, CsCl, ZnS (Zinc blende), CaF2) size effects, radius ratiorule and its limitations,Madelung constant, Stoichiometric and Non stoichiometric defects in crystals, Lattice energy (mathematical derivation excluded) and Born-Haber cycle, Solvation energy and its relation with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan’s rule. |  **Revision**  |