Second Year –Fourth Semester

Paper 402101 Inorganic Chemistry 3 Credits, 75Marks(45 Hrs)

3 Hrs/Week

I) Molecular Orbital Theory(MOT) : 10 Hrs

Conditions for the formation of Molecular Orbitals
Linear combination of Atomic Orbitals method to obtain Molecular Orbitals.
(LCAO- MO) approach, Application of (LCAO- MO) approach to the formation of :
Homonucleardiatomic molecules : H_2, He_2, N_2, O_2, F_2, Ne_2
Calculation of Bond Order and correlation with stability ,bond length and bond energy and magnetic properties of all the molecules mentioned.
Bond order in O_2,O_2^+ ,O_2^- ,O_2^{-2}
Heteronucleardiatomic molecules and molecular ion: CO, NO, CN^-
MO diagrams with explanation of bond order, stability, and magnetic behaviour.

II) Chemistry of Transition Elements: 5 Hrs

Definition and general characteristics of transition element.
Chemistry of transition elements (3d) with reference to : electronic configuration , atomic size, ionization potential, oxidation states , colour and magnetic property , formation of coordination compounds and applications.

III) Coordination Compounds 15Hrs

Distinction between double salts and coordination compounds
Werner's theory and its experimental verification
Effective Atomic Number (EAN) rule
IUPAC nomenclature
Isomerism in coordination compounds:
Structural : Ionization,Hydrate,Linkage and coordination position isomerism
Stereoisomerism: geometrical and optical isomerism with reference to coordination number 4 and 5
Bonding in Coordination Compounds based on Valence Bond theory (VBT)
Application to 4,5,6 coordinate complex
Electroneutrality principle and Back bonding

IV) Gravimetric Analysis : 10 Hrs

Definition and types of Gravimetric analysis
Precipitation Gravimetry
Solubility considerations : Common ion effect, diverse ion effect, pH, temperature and nature of solubility,Controlling particle size
Treatment of precipitates in gravimetry :
Digestion, Filtration and Washing, Drying and ignition
Use of Organic Reagents in Gravimetric Analysis

V) Acid Base concepts : 05Hrs

Different classifications of acids and bases such as Arrhenius, Bronsted –Lowry Lewis , Solvent system and Lux Flood concepts

Pearson's Hard Soft Acid Base (HSAB) principle