Paper-1(CHN 401) Inorganic Chemistry

I	**Stereochemistry and Bonding in Main Group Compounds**	**12 Hrs**

VSEPR, Walsh diagrams (tri- and penta- atomic molecules), d_π-p_π bonds, Bent rule and energetics of hybridization, some simple reactions of covalently bonded molecules

II	**Metal-Ligand Equilibria in Solution**	**8 Hrs**

Stepwise and overall formation constants and their interaction, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand, chelate effect and its thermodynamic origin, determination of binary formation constants by pH-metry and spectrophotometry.

III	**Reaction Mechanism of Transition Metal Complexes**	**24 Hrs**

Energy profile of a reaction, reactivity of metal complexes, inert and labile complexes, kinetic application of valence bond and crystal field theories, kinetics of octahedral substitution, acid hydrolysis, factors affecting acid hydrolysis, base hydrolysis, conjugate base mechanism, direct and indirect evidences in favour of conjugate mechanism, anation reactions, reactions without metal ligand bond cleavage. Substitution reactions in square planar complexes, the trans effect, mechanism of the subtitution reaction. Redox reactions, electron transfer reactions, mechanism of one electron transfer reactions, outer-sphere type reactions, cross reactions and Marcus-Hush theory, inner sphere type reactions

IV	**Metal-Ligand Bonding**	**15 Hrs**

Limitation of crystal field theory, molecular orbital theory, octahedral, tetrahedral and square planar complexes, π-bonding and molecular orbital theory.