Paper 602103 Inorganic Chemistry 3Credits,75 Marks(45hrs)

3 Hrs /week

I) Metal ligand bonding In TM complexes : 13Hrs

Crystal Field Theory (CFT)applied to coordination compounds
Assumptions of CFT, splitting of d orbitals in octahedral,tetrahedral and square planar complexes
Factors affecting the magnitude of 10 Dq / high and low spin complexes
Crystal field Stabilization energy (CFSE), calculation of CFSE for octahedral and tetrahedral complexes,Effect of crystal field splitting on ionic radii and lattice energy
Theoretical failure of CFT.

II) Electronic Spectra of TM complexes : 7Hrs

Types of electronic transitions like d-d, charge transfer, intra ligand
Rules for electronic transitions Laporte and Spin selection rule
Orgel diagram for d^1, d^4, d^6, d^9 metal ion
Electronic spectra of $[Ti(H_2O)_6]^{+3}$ complex ion
Application of electronic spectra.

III) Stability of complexes: 5Hrs

Thermodynamic and Kinetic stability of complexes
Stepwise and overall stability constants and their inter-relationship
Factors affecting thermodynamic stability, Chelate effect

IV) Substitution reactions of octahedral complexes 5Hrs

Introduction, types of reactions in complexes
Ligand substitution reactions:Basic Mechanisms
Labile and Inert complexes, Electronic configuration and lability of complex
Mechanism for acid and base hydrolysis of cobalt ammine complexes.

V) Bioinorganic Chemistry 10Hrs

Introduction, essential and nonessential elements,
Biological role of alkali metals (Na, K) and alkaline earth
Metalloporhyrinswith special reference to Haemoglobin, Myoglobin,Chlorophyll.

VI) Catalysis by Transition Metal complexes 5Hrs

IntroductionCatalysis with reference to i) hydrogenation of alkenes (Wilkinson catalyst) , ii) Hydroformylation reaction (Roolen catalyst) iii) polymerization of alkenes(Ziegler-Natta catalyst)