

**M.Phil. –Chemistry [Semester – II ]**  
**Paper III – [Elective] INORGANIC CHEMISTRY**  
**{50 MARKS}**

1. Co- ordination Chemistry { 25 marks }
2. Chemistry of Lanthanides and actinides – sperations. Spectral and magnetic properties – Use of lanthanide compounds as shift reagents – organo metallic chemistry – organometallic reagents in organic synthesis and in homogeneous catalytic reaction (hydrogenation, hydroformylation, isomerisation and polymerisation) p-acidmetal complexes – activation of small molecules by co-ordinations.

References:

1. Introduction to Ligand field theory  
-By Carl. J. Ballhalusen
2. Co-ordination compounds  
-By S.F.A.Kettle
3. Modern Co-ordination Chemistry  
-By F. Lewils and R.G.Wilkins

**2. Group Theory {25 marks}**

1. Hybrid orbitals and molecular orbitals for  $AB_n$  – Type molecules – Transformation properties of atomic orbitals – Hybridization scheme for 6 orbitals – Hybridization schemes for 'pi' bonding – Molecular orbitals theory for  $AB_n$  – Type molecules – relationship of the molecular orbital and the hybridization treatments – molecular orbitals of metal sandwitch compounds.
2. Molecular vibrations – The symmetry of Normal vibrations – Determining the symmetry types of the normal modes – Contribution of particular internal co-ordinates to Normal modes – calculation of force constants – selection rules for fundamental vibrational transitions .

References:

1. Group theory in chemistry  
-By V.Ramakrishnan & M.S.Gopinathan
2. Physical methods in Inorganic chemistry  
-By R.S.Gargo
3. Symmetry in Chemistry  
-By Jaffe & orelaan