

**INORGANIC CHEMISTRY****Mark: 80**

- I. *Symmetry and group Theory in chemistry:* **20 Hrs.****  
Symmetry element and operation, definition of mathematical group, sub group, cyclic group, conjugacy relation and classes, point symmetry group (Schonflies symbols), use of point group symmetry : optical activity, dipole moment, representation of group by matrices, character of representation, the great orthogonality theorem (without proof) and its importance, irreducible representation, character table and their use.
- II. *Stereochemistry and Bonding in main group compounds:* **16 Hrs.****  
VSEPR, Walsh diagrams (tri-and penta-atomic molecules),  $d\pi$ - $p\pi$  bonds, Bent rule and energetics of Hybridization, some simple reaction of covalently bonded molecules.
- III. *Metal-Ligand bonding:* **18 Hrs.****  
Limitation of crystal field theory, Molecular orbital theory, Octahedral, tetrahedral and square planar complexes,  $\pi$ -bonding and molecular orbital theory.
- IV. *Electronic Spectra and magnetic properties of transition metal complexes:* **30 Hrs****  
Spectroscopic ground states, correlation, Orgel and Tanabe-Sugano diagram for transition metal complexes ( $d^1$  –  $d^9$ ), calculation for  $Dq$ , and  $b$  parameter, charge transfer spectra, spectroscopic method for assignment of absolute configuration in optically active metal chelates and their stereochemical information, anomalous magnetic moments, magnetic exchange coupling and spin crossover.
- V. *Isopoly and Heteropoly acid and salts of V, Mo, W.* **6 Hrs.****