

**DEVI AHILYA VISHWAVIDYALAYA, INDORE**

**M.Sc. CHEMISTRY (SEMESTER – II)**

Paper No.

: I (Code-MCH-406 )

Compulsory /Optional

: Compulsory

Max. Marks

: 100

**Paper – I : Inorganic Chemistry**

<b>Unit – I</b>	<b>Electronic Spectral Studies of Transition Metal Complexes :</b> Spectroscopic ground states, correlation. Orgel and Tanabe-Sugano diagrams for transition metal complexes ( $d^1$ - $d^9$ states), Selection rule for electronic spectroscopy. Intensity of various type electronic transitions. Calculations of $10Dq$ , $B$ and $\beta$ parameters, charge transfer spectra.
<b>Unit – II</b>	<b>Magnetic Properties of Transition Metal Complexes</b> Anomalous magnetic moments, Quenching of Orbital contribution. Orbital contribution to magnetic moment, magnetic exchange coupling and spin crossover.
<b>Unit – III</b>	<b>Metal <math>\pi</math>-Complexes</b> Metal carbonyl, structure and bonding, vibrational spectra of metal carbonyls for bonding and structural elucidation, important reactions of metal carbonyls; preparation, bonding structure and important reaction of transition metal nitrosyl, dinitrogen and dioxygen complexes; tertiary phosphine as ligand.
<b>Unit – IV</b>	<b>Metal-Clusters</b> Higher boranes, carboranes, metalloboranes and metallo-carboranes compounds with metal-metal multiple bonds.
<b>Unit – V</b>	<b>Optical Rotatory Dispersion and Circular Dichroism</b> Linearly and circularly polarized lights; optical rotatory power and circular birefringence, ellipticity and circular dichroism; ORD and Cotton effect, Faraday and Kerr effects; Assignment of electronic transitions; applications of ORD and CD for the determination of (i) absolute configuration of complexes and (ii) isomerism due to non-planarity of chelate rings.

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**Books Suggested :**

1. Advanced Inorganic Chemistry, F.A. Cotton and Wilkinson, John Wiley.
2. Inorganic Chemistry, J.E. Huheey, Harpes & Row.
3. Chemistry of the Elements. N.N. Greenwood and A. Earnshaw, Pergamon.
4. Inorganic Electronic Spectroscopy, A.B.P. Lever, Elsevier.
5. Magnetiochemistry, R.I. Carlin, Springer Verlag.
6. Comprehensive Coordiantion Chemistry eds., G. Wilkinson, R.D. Gillars and J.A. Mc Cleverty, Pergamon.

A sharma  
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