B. Sc. III Year (Vth Semester)

Paper-XV (CH-301) Inorganic Chemistry (Theory)

M.Marks: 32 **Time: 3 Hrs.**

Note: Nine questions will be set. **Q. No. 1** based on whole syllabus, is compulsory. There will be four questions from section A **and** four from section **B**. Candidates will be required to attempt five questions in all, selecting at least two questions from each section. Question no. 1 carry 8 marks and all questions in Section A & B (not more than 2 - 3 parts) carry 6 marks each .

Section – A (22 periods) Metal-

Ligand Bonding in Transition Metal complexes

Limitations of valence bond theory, an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planer complexes, factors affecting the crystal field parameters.

Thermodynamics and Kinetic Aspects of metal complexes

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, Irving William Series, substitution reactions of square planer complexes of Pt[II], Trans effect.

Section – B (23 periods)

Magnetic properties of Transition metal complexes

Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility, spin only formula, L-S coupling, correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes.

Electronic spectra of Transition metal complexes

Selection rules for d-d transition, spectroscopic ground states, spectrochemical series, orgel energy level diagram for d^1 and d^9 states, discussion of electronic spectrum of $[Ti(H_2O)_6]^{+3}$