

## B.Sc. II Paper – I

### Inorganic Chemistry

#### Unit - I

##### I Chemistry of Elements of First Transition Series

Characteristic properties of d-block elements.

Binary compounds (hydrides, carbides and oxides) of the elements of the first transition series and complexes with respect to relative stability of their oxidation states, coordination number and geometry.

##### II Chemistry of Elements of Second and Third Transition series

General characteristics, comparative treatment of Zr/Hf , Nb/Ta , Mo/W in respect of ionic radii, oxidation states, magnetic behavior, spectral properties and stereochemistry.

#### Unit – II

##### III Coordination Compounds

Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes.

#### Unit – III

##### IV Chemistry of Lanthanide Elements

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, ceric ammonium sulphate and its analytical uses.

##### V Chemistry of Actinides

Electronic conformation, oxidation states and magnetic properties, chemistry of separation of Np, Pu and Am from U.

#### Unit IV

##### VI Oxidation and Reduction

Electrode potential, electrochemical series and its applications. Principles involved in the extraction of the elements.

##### VII Acids and Bases

Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concept of acids and bases.

##### VIII Non-aqueous Solvents

Physical properties of a solvent, types of solvents and their general characteristics, Reactions in non-aqueous solvents with reference to liquid NH<sub>3</sub> and liquid SO<sub>2</sub>.