SEMISTER -II

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Code: 202101	**Title : Inorganic Chemistry**	**Credits : 4**

Objectives :-

1.Describe the fundamental requirement for interpretation of electronic spectra of metal compound for prediction of their properties.

2. Describe the studies of metal nitrosyls and its preparation, structures and properties.

3. Explain the classification of metal clusters and compound and Chemistry of dioxygen, dinitrogen complexes and non-carbonyl metal clusters.

4. Explain the properties of halogen compounds and noble gases.

Paper -I		**60 Hours**
Unit I	**Spectroscopic term symbols :** - Inter-electronics repulsion, spin orbit coupling, ground terms, determination of terms symbol of d1 to d5 Configuration / complexes, Energy ordering of terms, microstates. Racah parameter. Weak and stronger field approach. Correlation diagram of d^1 , d^2 , d^8 and d^9 configuration in octahedral and tetrahedral environments, Non-crossing rule. Orgel diagram of d^1 to d^9 configuration in an octahedral and tetrahedral environments, Tanabe Sugano diagram of d^2 and d^3 configurations.	15 Lectures
Unit II	**Organometallic Chemistry of Transition metals:-** 1.Eighteen and sixteen electron rule and electron counting with examples. 2. Preparation and properties of the following compounds (a) Alkyl and aryl derivatives of Pd and Pt complexes (b) Carbenes and carbynes of Cr, Mo and W (c) Alkene derivatives of Pd and Pt (d) Alkyne derivatives of Pd and Pt (e) Allyl derivatives of nickel (f) Sandwich compounds of Fe, Cr and Half Sandwich compounds of Cr, Mo. 3. Structure and bonding on the basis of VBT and MOT in the following organometallic compounds: Zeise's salt, bis(triphenylphosphine)diphenylacetylene platinum(0) [Pt(PPh3)2(HC≡CPh)2], diallylnickel(II), ferrocene and bis(arene)chromium(0), tricarbonyl (η2 -butadiene) iron(0)	15 Lectures
Unit III	**Halogen group & Noble gases:-** Halogen group :- Interhalogens, Pseudohalogen, synthesis, properties & applications, structure, oxyacids & oxoanions of Hallogens Bonding. Noble gases:- Synthesis, properties, uses, structure & bonding with respect to VSEPR.	15 Lectures
Unit IV	**Metal nitrosyl compounds :-** Preparations and properties of Nitrosyl halides (NOX), Metal nitrosyl halides, compounds containing NO- group, Compounds containing NO+ groups, Preparation, structure and application of sodium Nitropruside. EAN and Eighteen electron rules applied to nitrosyl compounds, Nitrosyl compounds of Cobalt, iron and Manganese. Significance of NO for the life of living animal.	15 Lectures

Reference Books :

1. Inorganic Chemistry , J.E. Hubeey, E.A. Keitler, R.L. Keitler.
2. Concise Inorganic Chemistry - J.D. Lee.
3. Symmetry and Spectroscopy of Molecules - K. Veera Reddy
4. Advanced Inorganic Chemistry - Vol. I - Satyaprakash, Tuli, Basu and Madan.
5. Selected Topics in Inorganic Chemistry - W.U. Malik, G.D. Tuli & R.D. Madan.
6. Advanced Inorganic Chemistry Vol. I & Vol. II - Gurdeep and Raj.
7. Some aspect of Crystal Field theory- T. M. Dunn, D.S.Mcclure & R. G. Person