Elective Paper I (Group A)
Organotransition Metal Chemistry **60 Hrs.**

I **Compounds of Transiotion Metal-Carbon Multiple bonds:** **12 Hrs.**

Alkylidenes, alkylidynes, low valent carbenes and carbines – synthesis, nature of bonds, structural characteristics, nucleophilic and electrophilic reactions on the ligands.

II **Transition Metal ð–Complexes** **18 Hrs.**

Transition metal ð–Complexes with unsaturated organic molecules: alkenes, alkynes, allyl, dienes, dienyl and arene complexes – preparations, properties, nature of bonding and structural features. Important reactions related to nucleophilic and electrophilic attack on ligands.

III **Transiotion Metal Compounds with Bonds to Hydrogen:** **3 Hrs.**

Covalent hydrides : synthesis and important reactions.

IV **Transiotion Metal Compounds with Bonds to Carbon in Catalysis:** **14 Hrs.**

a. General idea of important catalytic steps: ligand coordination and dissociation, insertion and elimination, nucleophilic attack on coordinated ligands, oxidative addition and reductive elimination reactions.

b. Hydrogenation of alkenes using Wilkinson's catalyst, Hydroformylation of alkenes using Co and Rh catalysts, Carbonylation of methanol to acetic acid (Monsanto process), Oxidation of alkenes (Wacker process)

V **Fluxional Organometallic Compounds:** **8 Hrs.**

Fluxionality and dynamic equillibria in compounds such as $ç^2$-olefine, $ç^3$-allyl and dienyl complexes.

VI **Organometallic Compounds of Lanthamides and Actinides:** **5 Hrs.**

Methods of preparation, properties and structural features.

Books Suggested:

1. Principals and Application of Organotransition Metal Chemistry: J.P.Collman, L.S.Hegsdus, J.R.Norton and R.G.Finke, University Science Book.
2. Principals of Organometallic Compounds, Edn-II: P.P.Power.
3. Organometallic Chemistry: R.C.Mehrotra and A.Singh, New Age International.