

7. (a) Give a brief account on the metal carbyne complexes, their synthesis and structural features.
- (b) What are Alkylidenes ? How are they different from carbenes ? 16

Unit IV

8. (a) Discuss hydrogenation of alkenes with suitable example.
- (b) What is homogenous catalytic hydrogenation ? Discuss with the help of suitable example. 16
9. (a) What is Fluxionality ? Explain with suitable examples.
- (b) Discuss hydroformylation of olefins in detail. 16



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31545

M.Sc. EXAMINATION, 2025

(Fourth Semester)

(2020-21 Onwards)

(Regular & Re-appear)

CHEMISTRY

Inorganic Chemistry Special-IV

Time : 3 Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. Each question carries 16 marks.

1. Answer the following : 16

- (a) What are electron deficient organometallic compounds ?
- (b) Discuss the stability of alkyl transition metal complexes.

- (c) What are Metallocene ?
- (d) What are Ylides ?
- (e) Discuss structure of Schrock carbene.
- (f) Write a short note on metal carbyne complexes.
- (g) Give a brief account on rotation of ligands on metals.
- (h) What is Wacker's process ?

Unit I

- 2. (a) Give a brief account on classification of organometallic compounds.
- (b) Discuss the main features of cluster compounds. **16**
- 3. (a) Write a detailed note on stability of metal-alkyl complexes and various decomposition pathways.
- (b) Give a brief account on application of organocopper in organic synthesis. **16**

Unit II

- 4. (a) Explain the bonding in metal-alkene complexes.
- (b) Explain structure and bonding in η^3 -Allyl complexes of transition metal complexes with examples. **16**
- 5. (a) Give the preparation and electrophilic substitution reaction of ferrocene.
- (b) Write a short note on C_4H_4 as a ligand discussing the synthesis and bonding in cyclobutadienyl-metal complexes. **16**

Unit III

- 6. (a) Write down methods of preparation, structure bonding and important reactions of Fischer carbene complexes.
- (b) Differentiate between Fischer and Schrock carbene on structure basis. **16**