Unit IV

7. (a) Discuss the oxidative addition and reductive elimination reaction in detail. **10**

(b) What is Wilkinson catalyst ? Discuss its role in the hydrogenation of ethylene. **10**

8. (a) Discuss the mechanism of polymerization of ethylene using Ziegler-Natta catalyst. **10**

(b) Describe the Wacker's process and Monsanto Process. **10**

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DD-291

M. Sc. EXAMINATION, Dec. 2018

(Fourth Semester)

(Re-appear Only)

CHEMISTRY

CH602B

Inorganic Special-IV

(Organometallic Chemistry)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss general routes of synthesis of transition metal alkyls and aryls. **10**

(b) Describe general methods of preparation and properties of transition metal carbonyls. **10**

2. (a) Explain the various decomposition pathways of transition metal alkyls. How can these reaction be inhibited ? **10**

(b) Write short notes on the following : **5,5**

(i) Haptacity/cluster organometallic compounds

(ii) 18-electron rule.

Unit II

3. (a) What are metal alkyl complexes and how alkyl group is attached to metal ? Discuss the structure and bonding in η^3 alkyl complexes. **10**

(b) Write down the five important reactions of ferrocene. **10**

4. (a) Discuss IR and NMR spectral techniques used for structure elucidation of allylic compound. **10**

(b) Describe the reactivity of coordinated alkenes and alkynes with electrophiles and nucleophiles. **10**

Unit III

5. (a) Write down the various important reactions of transition metal carbene complexes. **10**

(b) What are transition metal carbyne complexes ? Explain structure and important reactions of carbyne complexes. **10**

6. (a) Discuss various methods of preparation structure and bonding of Schrock carbene complexes. **10**

(b) What do you understand by ligand scrambling on metals ? Discuss with the help of suitable examples. **10**