Reg. No.										

Manipal University

Department of Sciences

III SEMESTER M.Sc. (CHEMISTRY),

END SEMESTER EXAMINATIONS, NOV/DEC 2015

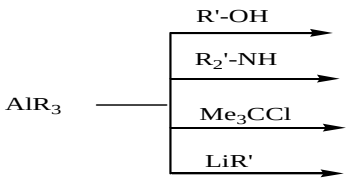
SUBJECT: ADVANCED ORGANIC CHEMISTRY-I (CHM – 701)

REVISED CREDIT SYSTEM

Time: 3 Hours Date: MAX. MARKS: 50

Instructions to Candidates:

- Answer any five full questions.
- Missing data may be suitably assumed.

1A.	Describe the chemical properties, two synthetic methods and structure of organomagnesium compounds.	**3**
1B.	Explain synthesis, bonding and two important synthetic applications of organo tin compounds	**3**
1C.	**i)** What is Tebbe's reagent? Explain its applications in organic synthesis. **ii)** Explain the bonding in metal-carbonyl and metal-alkyne complexes.	**4**
2A.	**i)** Give two synthetic methods for the following metal complexes. **a.** Metal-alkyl complexes **b**. Metal-alkene complexes **ii)** Give reason: Metal carbonyls undergo nucleophilic attack readily while they resist electrophilic attack.	**3**
2B.	Describe two synthetic methods, structure and bonding of Fischer carbenes. How are they different from Schrock carbenes?	**3**
2C.	**i)** Give chemical properties and synthetic applications of organolithium compounds **ii)** Discuss the aromaticity and electrophilic substitution reactions of metal cyclopentadiene complexes.	**4**
3A.	**i)** What is Collman's reagent? Mention its uses. **ii)** Describe the chemical properties and uses of metal-hydrides.	**3**
3B.	**i)** Explain the chemical properties, bonding of metal allyls. **ii)** How is stable transition metal alkyls prepared?	**3**
3C.	**i)** Predict the product in the following. (R=Alkyl)  **ii)** Explain two synthetic applications of organosilicon compounds.	**4**

4A.	Define fluxionality. Explain the structural features of any two fluxional isomers in detail.	**3**
4B.	What are metal clusters? How is PSEPT rule used to count the electrons in metal clusters? Explain with two examples.	**3**
4C.	**i)** Explain dissociative and associative interchange mechanisms to explain ligand substitution reactions. **ii)** What are migratory insertion reactions? Explain the mechanism involved with an example.	**4**
5A.	Describe the synthesis of Wilkinson's catalyst and two of its applications	**3**
5B.	Explain the mechanism of reductive elimination. How does the geometry of the square planar complexes change upon oxidative addition reaction?	**3**
5C.	i) Describe the hydrocyanation of ethylene by NiL_4. ii) Explain the mechanism of nickel carbonyl catalyzed carbonylation of alkene.	**4**
6A.	i) Explain the mechanism of olefin isomerization in converting allyl alcohol to propanal. ii) What will be the formula of manganese carbonyl assuming that the 18 electron rule is obeyed? Explain the reasoning.	**3**
6B.	Explain the hydroformylation catalytical cycle using $HRh(CO)(PPh_3)_2$ catalyst.	**3**
6C.	**i)** Explain the applications of organometallics as drugs, radiopharmaceuticals. **ii)** Give reasons for the following: **a)** Electron deficiency in the metal center favors reductive elimination. **b)** After the oxidative addition reaction, the co-ordination number of the metal increases by two in Vaska's reagent.	**4**