Roll No. .....

42001

M. Sc. (Chemistry) 4th Semester Examination – May, 2019

INORGANIC SPECIAL-IV

Paper : CY(H)-401(a)/4281

Time : Three Hours] *[Maximum Marks : 80*

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

Note : Question No. **1** is ***compulsory*** and all questions carry equal marks. Attempt ***five*** questions in all, selecting at least ***one*** question from each section.

1. Compulsory Question :

2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 16

(a) Write structure of Zeise salt.

(b) Define 18 - electron rule.

(c) Which better π-acceptor out alkens and alkynes.

(d) Explain Wacker's Process.

(e) Write formula for any catalyst used in Ploymerisation of alkenes.

(f) Draw shapes of type of carbenes.

(g) What is electrophilic attack ?

(h) What are fluxional molecules ?

P. T. O.

SECTION – A

2. Write short notes on :

(a) (i) Electron deficient organometallic compounds.

(ii) Homo and hetero-leptic organometallic compounds. 6

(b) Discuss general methods of preparation of Transition metal alkyls. 10

3. (a) Describe the use of organocopper compounds in organic synthesis. 8

(b) Transition metal σ-hydrocarbyls are more labile, how would you account for their instability ? 8

SECTION – B

4. (a) Discuss the general methods of preparation of metal alkene complexes. 6

(b) What are metal-allyl complexes and how allyl group is attached to metal ? Explain the structure and bonding in η^3-allyl complexes. 10

5. (a) Draw and discuss the molecular orbital diagram of ferrocene. 10

(b) Discuss how alkynes show electrophiles and nucleophiles with examples. 6

SECTION – C

6. (a) Discuss bonding in Schrock type complexes.

   (b) Write all preparation methods for complexes.

7. (a) Explain structure and bonding in metal complexes.

   (b) Write preparation and chemical properties transition metal carbyne Complexes.

SECTION – D

8. (a) Discuss the mechanism of hydrogenation alkenes using Wilkinson catalyst.

   (b) Explain the fluxional character in the complex of cyclopentadienyl.

9. Represent fluxional nature of TBP complexes. Also explain the rate of fluxionality of stereochemically non-rigid molecule can be determined by NMR spectroscopy. 10