

PD- 374 CV-19
M.Sc, Chemistry (Third Semester)
Term End Examination DEC.-2020
Compulsory/Optional
Group- A
Paper – III

Name/ Title of Paper: **ORGANOTRANSITION METAL CHEMISTRY**

Time : Three Hours]

[Maximum Marks : 80

Minimum Marks : 29

Note : Answer from Both the section as Directed. The figures in the right hand margin indicate marks.

Section-A

1- Answer the following questions:

1X10

- (a) Write one example of Polynuclear Organometallic compounds?
- (b) Give one example of elimination reaction?
- (c) Write one example of a carbyne complex?
- (d) How many number upaired electros in de-ox haemoglobin?
- (e) Write one example of symmetrical organometallic compound?
- (f) Which type of bonding is found in sodium- cyclopentadienide?
- (g) Write approximate time scale (s) for Electron spin Resonance spectroscopy?
- (h) Write full form of OMO & LUMO with reference to fluxional organometallic compounds?
- (i) Write the structure of Zeise's Salt?
- (j) Draw Structure of Wilkinson's catalyst?

2- Answer the following short answer type question

2X5=10

- (a) In what conditions transition metal alkyls can be stable?
- (b) Why singlet dichloro carben (:CCl₂) is more stable than triplet dichloro carbene (.CCl₂)
- (c) What is haptotropic shift? Explain with example?
- (d) How will you distinguish between dihydrogen and dihydride complexes?
- (e) What are the advantages of increasing the rate of reaction by using catalyst over the increasing temperature?

Section-B

Answer the following Long- answer type of questions -

12X5=60

Unit-I

3- Discuss the decomposition reactions of transition metal alkyls. How can these decomposition reaction be inhibited.

Or

Write down the methods of preparation and synthetic applications of organ copper compounds?

Unit-II

4- Write down methods of preparation, structure bonding and important reactions of schrock carbene complexes?

Or

Write down methods of preparation, structure, bonding and important reactions of carbyne complexes?

Unit-III

5- Write down methods of preparation of ferrocene? Draw and discuss about M.O. energy level diagram of ferrocene?

Or

Explain the structure and bonding of η^6 - arene metal complex?

Unit-IV

6- What are transition metal carbonyl hydrides? Discuss their methods of preparation, structure, bonding and important reactions.?

Or

Discuss the fluxionality in-

- a- η^3 -allyl complexes.
- b- Cyclopentadienyl complexes.

Unit-V

7- Write short notes on the following –

- a- The Fischer Tropsch synthesis
- b- Hydrosilation

Or

Define the following terms-

- a- Selectivity of catalyst
- b- Efficiency of catalyst
- c- Catalytic cycle
- d- Classification of catalyst