

Total No. of Questions :4]

SEAT No. :

P1893

[Total No. of Pages :3

[5323] - 306

M.Sc. - II (Inorganic Chemistry)

**CHI - 326 : ORGANOMETALLIC CHEMISTRY AND
HOMOGENEOUS CATALYSIS
(2013 Pattern) (Semester - III)**

Time : 3 Hours]

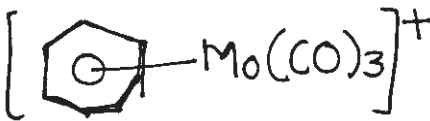
[Max. Marks :50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*

Q1) Answer the following:

[20]

- a) Give the general features of homogeneous catalysis.
- b) What are the prerequisite conditions for asymmetric catalysis?
- c) List the various biphasic systems.
- d) Which of the following complexes obey $18\bar{e}$ rule?
 - i) $\text{Fe}_2(\text{Co})_g$
 - ii) 
- e) What is hapticity? Explain with example.
- f) Define one angle and bite angle.
- g) What are similarities between Suzuki and Heck coupling reaction.
- h) List the different methods for the preparation of metal-carbonyl compounds.
- i) Why do transition metals act as catalyst? Give two examples.
- j) Comment on the therapeutic properties of.
 - i) Mercurochrome.
 - ii) Cisplatin.

P.T.O.

Q2) Attempt any TWO of the following:

[10]

- a) Give the systematic classification of σ -bonded transition metal hydrocarbonyls.
- b) Discuss Tollman catalytic cycle.
- c) Explain the $\nu(\text{CO})$ band in the IR spectrum of $[\text{Fe}(\text{CO})_4]^{-2}$ is at about $1>90 \text{ cm}^{-1}$; whereas for $\text{Ni}(\text{CO})_4$ it is about 2060 cm^{-1} .
- d) Explain with the help of suitable example of the role of organometallic compound as a protecting agent.

Q3) Attempt any TWO of the following:

[10]

- a) Give synthesis, bonding and properties of cyclobutadienes compounds.
- b) What do you mean by Heck reaction? Explain the steps involved in cyclopropanation reaction.
- c) Give the typical reactions of $(\eta^6\text{-arene})$ - metal derivatives.
- d) Give an account of the chemistry, structure and bonding of the π -allyl complexes of transition metals.

Q4) A) Write note on any one.

[5]

- a) Importance of chiral ligand in Asymmetric catalyst.
- b) Fluxional behaviour of organometallics.

B) Complete the following reactions

[5]

