**Question Bank**

**Class: B. Sc. (Chemistry), 4th Semester, (2022-2023)**

**Subject: (Electrochemistry) Code: CUTM 1478**

**Section A**

1. Short answer questions
2. What is Organometallic Chemistry?
3. Give two examples of Organometallic Catalysts?
4. What is Hapticity?
5. Define Eighteen electron rule
6. Why metal carbonyl observes low oxidation state?
7. What is the geometry of pentacarbonyl iron(0)?
8. What is the electron count for ferrocene?
9. How many bridging carbonyl ligands are present in solid Co2(CO)8?
10. What is the name of CH3-Be-CH3
11. What is the role of Ziegler-Natta catalyst.
12. Why lithium alkyl and aryls are more stable than the corresponding alkyl or aryls of other alkali metals?
13. What is trans effect
14. What is labilizing effect?
15. Difference between Ia and Id mechanisms.
16. Gasoline synthesis by using catalyst
17. Tolman catalytic loops for hydrogenation of alkene

**Section B**

1. Long answer questions
2. What do you mean by organometallic compounds? Give some example of different organometallic compounds like main group, transition metal group? Give two applications of organometallic compounds?
3. What is the concept Hapticity? Explains different organometallic compound stability with hapticity ligands.
4. What is EAN rule? Show that the following carbonyls Cr(CO)6, [Co(CO)4]-, [Fe(CO)4]2+ and [V(CO)6]- obey this rule.
5. Give the MO diagram of CO, write the structures of chromium mononuclear carbonyl and binuclear iron carbonyl.
6. Describe the bonding in carbonyl compound.
7. What is Back Bonding? Explains the Structure, Bonding, Hybradisation and Magnetic properties of Zeiss’s salt complex.
8. Explains the 18 electrons concepts for Ferrocene? Explain the Preparation of Ferrocene? Comparison of aromaticity and reactivity with that of benzene?
9. Give the name, preparation and structure of Zeise’s salt. Whether it shows synergic effect.
10. Describe the preparation, reaction and structure of ferrocene.
11. Discuss the role of trimethyl aluminium in polymerisation of ethane.
12. Give an account of multicentre bonding in metal alkyls.
13. What is trans effect, Explain the theories of trans effect?
14. Explain the mechanism of nucleophilic substitution in square planar complexes?
15. Discuss the general mechanism of substitution in octahedral complexes.
16. Discuss the kinetics of octahedral substitution.
17. Explain the nature of two reaction pathways in square planar substitution reaction.
18. Write the reaction mechanism of Wilkinson’s catalyst of alkene hydrogenation.
19. Describe the catalytical cyclic of hydroformylation recation.

* (N.B. Students are required to submit the assignments on declared dates (within one week when the assignment is given). **Late submission will be penalized with low marks**. Assignments which are copied or are of poor quality may be asked for re-submission of assignments.)