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Total No. of Pages : 02

Total No. of Questions : 11

B.Sc. (Honours) Chemistry (Sem.-5)
INORGANIC CHEMISTRY-IV(ORGANOMETALLIC CHEMISTRY)

Subject Code : BHCL301-19

M.Code : 90737

Date of Examination : 12-12-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION-B contains EIGHT questions carrying FOUR marks each and students have to attempt any SIX questions.
3. SECTION-C will comprise of two compulsory questions with internal choice in both these questions. Each question carries TEN marks.

SECTION-A

1. Write briefly :

- a. Give any two factors affecting thermodynamic stability of complexes.
- b. What is Multicentre bonding in metal complexes?
- c. What is chelate effect?
- d. What are metal alkyl tetramers? Write the examples and method of preparation.
- e. How substitution of phosphine for carbonyl in metal carbonyl complex affects IR Spectra of metal carbonyl complex? $[M(PR_3)(CO)_x]$
- f. What are sandwich complexes? Write its structure.
- g. What is Schlenk equilibrium?
- h. What is Grignard reagent? Write its structure in ether.

SECTION-B

2. Write general methods of preparation of metal carbonyl compounds.
3. How polymerization of ethylene is conducted? Explain the role of various organometallic complexes in polymerization. Discuss its catalyst role in chemistry.
4. What is Trans effect? Explain.
5. What is 18 electron rule? Discuss with examples.
6. Discuss the chemistry of bis(benzene)metal complex.
7. Discuss method of preparation of different mononuclear carbonyl compounds?
8. What is inert and labile complexes? Explain
9. Explain how the acid hydrolysis of $\text{cis} [\text{Co}(\text{en})_2(\text{OH})\text{Cl}]^{+1}$ complex differ from that of the *trans* $[\text{Co}(\text{en})_2(\text{NO}_2)\text{Cl}]^{+1}$ complex?

SECTION-C

10. a. What is Zeise salt? Write its preparation and its structure.
- b. Discuss the various method of preparation of metal carbyne complex.

OR

- a. What are bis(cycloperitadienyl)complex? Write their structure and preparation.
 - b. What are bridged methylene complex?
11. a. What is Outer Sphere Mechanism?
 - b. What are various factors affecting the rate of ligand substitution reactions in square planar complexes?

OR

- a. Discuss all the factors that evidence that establish the $\text{S}_{\text{n}}1(\text{CB})$ mechanism for base hydrolysis of octahedral complexes.
- b. The rate of water exchange for $[\text{Mo}(\text{H}_2\text{O})_6]^{+3}$ is very slow. Explain

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.