22P311 (Pages: 2) Name: .....

Reg.No: .....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2023

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P CHE3 C10 - ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY

(Chemistry)

(2019 Admission onwards)

Time : 3 Hours Maximum : 30 Weightage

Section A

Answer any ***eight*** questions. Each question carries 1 weightage.

1. Draw the structure of the following metal carbonyls: (a) $Mn_2(CO)_{10}$ (b) $Co_2(CO)_8$ (c) $Ni(CO)_4$
2. Write any one method of preparation of fischer carbene.
3. Discuss any two synthesis of allyl complexes.
4. Find the number of cluster electrons involved in the following clusters (a) $[Ru_6(CO)_{17}]$ (b) $Os_6(CO)_{18}$ (c) $Os_5(CO)_{16}$ (d) $Fe_5(CO)_{15}C$
5. Explain the insertion reactions involving CO.
6. Suggest three major steps involved in homogeneous catalysis.
7. Mention any two roles of alkali metal ions in biological systems.
8. Give name of the iron transport protein and explain.
9. Discuss the significance coenzyme B-12.
10. What is the role of Mg(II) in chlorophylls.
11. Discuss any two synthesis of olefin complexes.
12. What are the functions of metalloenzymes?

(8 × 1 = 8 Weightage)

Section B

Answer any ***four*** questions. Each question carries 3 weightage.

13. What are the different methods for counting electrons for the 18-electron rule? Using $Fe(CO)_4PPh_3$ explain.
14. Disscuss the chemical reactions of ferrocene.
15. Give a brief overview of zintl anions and cations, using examples.
16. Discuss the Wacker process.

17. Write a note on the conversion of syngas into hydrocarbons and water. Give name of the the process.

18. Discuss the coordination sites in biologically important ligands.

19. Discuss the functions of myoglobin.

(4 × 3 = 12 Weightage)

Section C

Answer any ***two*** questions. Each question carries 5 weightage.

20. (a) Discuss the structure and bonding in metal nitrosyls.
    (b) How are linear and bent metal nitrosyls distinguished by spectroscopic technique?

21. Explain metal clusters briefly.

22. Write a note on hemerythrin and hemocyanin.

23. Explain the structure and functions of Superoxide dismutase.

(2 × 5 = 10 Weightage)

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