23P409S (Pages: 2) Name : .....

Reg. No : .....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2025

(CBCSS-PG)

(Regular/Supplementary/Improvement)

CC19P CHE4 E08 - ORGANOMETALLIC CHEMISTRY

(Chemistry)

(2019 Admission onwards)

Time: 3 Hours Maximum: 30 Weightage

Section A

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

1. Explain the ionic and covalent counting models in organometallic compounds, taking ferrocene as a representative example.
2. Give method of preparation for Ni(η3-C3H5)2.
3. Can you explain the reaction of nucleophilic addition to metal carbonyls?
4. Explain oxidative decarbonylation.
5. Discuss the stretching frequency of nitrosyl group in nitrosyl complexes.
6. What are fluxional organometallic compounds?
7. What are the structural possibilities for dinitrogen ligands?
8. Explain ionic mechanism of oxidative addition.
9. Write an example for reductive coupling reaction.
10. Explain the difference between insertion and elimination with suitable examples.
11. What is Collman's reagent?
12. Explain Schrock carbenes.

(8 × 1 = 8 Weightage)

Section B

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

13. Discuss the classification of organometallics based on the nature of metal carbon bond.
14. Explain Zeigler Natta catalyst and its applications.
15. Discuss the structure and bonding in metal ethylene complexes.
16. Discuss homogenous catalysed hydrogenation reaction.
17. Explain isomerisation reaction with suitable example.

18. Discuss CO insertion reactions with examples.

19. Write a note on applications of organometallic polymers.

(4 × 3 = 12 Weightage)

Section C

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

20. Explain in detail the preparation, structure and reactions of transition metal complexes of ethylene and allyl ligands.

21. Give an account of the synthesis and structure of carbene and carbyne complexes.

22. Discuss oxidative addition and reductive elimination with suitable examples.

23. Explain the following: (a) Water gas shift reaction (b) Fischer Tropsch reaction.

(2 × 5 = 10 Weightage)

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