23145507

QP CODE: 23145507

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, DECEMBER 2023

First Semester

CORE - CH500101 - ORGANOMETALLIC AND NUCLEAR CHEMISTRY

M Sc CHEMISTRY, M Sc ANALYTICAL CHEMISTRY, M Sc APPLIED CHEMISTRY , M Sc PHARMACEUTICAL CHEMISTRY, M Sc POLYMER CHEMISTRY

2019 ADMISSION ONWARDS

D077B63E

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. The compound $Co_2(CO)_8$ is unreactive compared to $Co(CO)_4$. Why?
2. Give the structure of $Os_3(CO)_{12}$.
3. Give one example for electrophilic attack on coordinated ligands.
4. What is reductive elimination? Give an example.
5. What are the catalysts used in water gas shift reaction?
6. Distinguish between metal oxides and metal-oxo complexes.
7. Which are the metal ions present in superoxide dismutase? What are their functions?
8. How does vitamin B_{12} reacts with ATP?
9. Write the synthesis reactions for neptunium and plutonium.
10. Give two examples for radiation-induced syntheses in organic chemistry.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Discuss important methods for the synthesis of diene and olefin complexes.
12. What are metallocenes? Illustrate important structural features of metallocenes.

13. Discuss β-elimination with suitable examples.

14. Explain the Reppe reaction.

15. Explain the mechanism of insertion of CO in the Ph-H bond catalysed by RhI complex bearing PPh_3 ligands

16. Account for the mechanism of ion transport across membranes.

17. Discuss the use of transition metal ions in MRI.

18. What is neutron capture cross section? What is its importance?

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. a) Give a comparitive study of the the IR spectra of bridging and non-bridging CO ligands. b)Explain Wade-Mingos rules with suitable examples.

20. a)Discuss hydroformylation of olefins using cobalt and rhodium catalysts b) Explain the use of Ziegler Natta catalysts in alkene polymerisation.

21. Discuss oxygen binding by haemoglobin and myoglobin.

22. Discuss analytical applications of radioisotopes.

(2×5=10 weightage)