

QP CODE: 19002495



Reg No :

Name :

18

M.Sc. DEGREE (C.S.S) EXAMINATION, NOVEMBER 2019

First Semester

Faculty of Science

CHEMISTRY

Core - CH500101 - ORGANOMETALLIC AND NUCLEAR CHEMISTRY

(Common to all Branches of Chemistry)

2019 Admission Onwards

32882531

Maximum Weight: 30

Time: 3 Hours

Part A (Short Answer Questions)

Answer any eight questions.

Weight 1 each.

1. Write one method for the synthesis of ferrocene.
2. Compare the CO stretching frequency of bridging and non-bridging CO ligands.
3. Distinguish between nucleophilic addition and nucleophilic abstraction.
4. When $\text{RhH}(\text{CO})(\text{PPh}_3)_3$ is used as the catalyst for hydroformylation, excess PPh_3 is added to the reaction mixture. Why?
5. Distinguish between simple metathesis and cross metathesis.
6. Write one reaction catalysed by Pd^0 .
7. Distinguish between active and passive transport across biological membranes.
8. What are the functions of cyanocobalamin?
9. What is $1/V$ law?
10. List four common criteria used to evaluate the performance of any radiation detector type.
(8×1=8 weightage)

Part B (Short Essay/Problems)

Answer any six questions.

Weight 2 each

11. Compare the bonding in carbonyl and cyanide complexes.

12. Give an account of fluxional behaviour of η^3 -allyl complexes.
13. Discuss the mechanism of alkene hydrogenation using Wilkinson's catalyst.
14. Give an account of dehydrogenation reactions involving oxidative addition.
15. Compare the modes of binding of O_2 to the metal centres in (a) myoglobin (b) haemerythrin and (c) haemocyanin.
16. Write a note on biological calcification.
17. Write a note on radiometric titrations.
18. What is radiation polymerisation?

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any two questions.

Weight 2 each.

19. Give an account of the chemistry, structure and bonding of the π -allyl complexes of transition metals. Discuss methods for the preparation of π -allyl complexes of transition metals.
20. Give a detailed account of oxidative addition reactions with reference to different mechanisms involved.
21. Discuss various types of carbonylation reactions with special reference to catalysts and mechanisms involved.
22. a) Give a detailed account of redox metalloenzymes.
b) Discuss the structure and functions of carbonic anhydrase, carboxypeptidase A and superoxide dismutase.

(2×5=10 weightage)