QP CODE: 25025217

Reg No : .....

Name : .....

M.Sc DEGREE (CSS) EXAMINATION, MAY 2025

Second Semester

CORE - CH500201 - COORDINATION CHEMISTRY

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

2019 ADMISSION ONWARDS

3596BA84

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Define chelate effect with an example.
2. Explain the nature of Jahn Teller (JT) distortion expected for an octahedral complex of d^9 metal ion.
3. The octahedral high spin Complex $[Cr(H_2O)_6]^{2+}$ shows one UV/Vis absorption band. Assign the transition using Orgel diagram.
4. $KMnO_4$ is intensely coloured. Explain the reason.
5. What is Curie- Weiss law?
6. Give a short description of substitution reactions in five coordinate complexes.
7. Explain dissociative mechanisms with an example.
8. "Lanthanide ions generally give sharp bands in their electronic spectra." Criticaly evaluate the statement.
9. Draw and Explain the Optical Isomers of $[PtCl_2(en)_2]^{2+}$.
10. Alkali metals are dissolved in organic solvents. Justfy with suitable example.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Elaborate the sigma and pi bonding ability of the ligands CN^- , R_3P, and Ar_3P with examples.
12. Give and explain the MO energy level diagram of tetrahedral complexes with a suitable example.

13. What are correlation diagrams? Discuss the significance of correlation diagrams with an example.

14. "The complex $[Fe(Phen)_2(NCS)_2]$ shows magnetic moment value of 4.90 above 175 K. Below that temperature the magnetics moment value drops considerably." Explain.

15. What are the different factors affecting the stability of complexes? Explain.

16. Discuss the racemisation reactions in complexes.

17. Write a descriptive account of the σ-bonded and cyclopentadienyl complexes of lanthanides.

18. Discuss about the sandwich complexes of actinoids.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss crystal field theory of coordination complexes.

20. Explain Gouy method for the determination of magnetic moment of complexes and spin only magnetic moment

21. Discuss inner sphere reactions with Taube mechanism.

22. Discuss the application of ORD and circular dichroism for the determination of absolute configuration of complexes.

(2×5=10 weightage)