



25805000

QP CODE: 25805000

Reg No :

Name :

INTEGRATED M.Sc DEGREE EXAMINATION, NOVEMBER

2025 Third Semester

INTEGRATED M.Sc BASIC SCIENCE-CHEMISTRY

CORE - ICH3CR01 - INORGANIC CHEMISTRY-1

2020 Admission Onwards

49EE55F6

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

Answer any **eight** questions.

Weight **1** each.

1. Write two examples for each a) cationic complexes b) Neutral complex.
2. Explain the optical activity exhibited by co-ordination compounds. Give at least two examples.
3. What is the geometry of $[\text{CoF}_6]^{3-}$ according to VBT. Explain.
4. Tetrahedral complexes are high spin. Why?
5. Which is more stable? $\text{K}_3[\text{Fe}(\text{CN})_6]$ or $\text{K}_4[\text{Fe}(\text{CN})_6]$? Why?
6. Draw the structure of cis and trans-platin?. How will you distinguish them?
7. Classify the following into hard and soft bases: H^- , NH_3 , CO , CH_3COO^-
8. Separate the following non-aqueous solvents as protic and aprotic a) Water, b) HF, c) Benzene, dinitrogen tetroxide and phosphorous oxy chloride.
9. Write down the general methods for the preparation of interhalogen compounds?
10. What are pseudohalogens? Give example.

(8×1=8 weightage)

Part B (Short Essay/Problems)

Answer any **six** questions.

Weight **2** each.

11. How many geometrical isomers can exist for the following species? Draw the possible isomers a) $[\text{PtCl}_2(\text{NH}_3)_2]$ b) $[\text{CoCl}_3(\text{NH}_3)_3]$ c) $[\text{ZnCl}_2(\text{NH}_3)_2]$ d) $[\text{CoCl}_3(\text{NH}_3)(\text{en})]$ e) $[\text{Co}(\text{en})_3]^{3+}$
12. Explain the structure of $[\text{NiCl}_4]^{2-}$ and $[\text{Cu}(\text{NH}_3)_4]^{2+}$.





13. Explain in detail about the spectral and magnetic properties of coordination complexes.
14. Differentiate SN1 and SN2 mechanism of square planer complexes.
15. A number of metals dissolve in liq. Ammonia to give strongly reducing solutions. Explain.
16. How will you prove electropositive character of iodine?
17. Give reason for the following a) group II cation analysis is done in acid medium b) Group IV cation analysis is done in ammonium hydroxide solution c) Group III cation analysis is to be done in presence of excess NH₄Cl.
18. What are interfering acid radicals? How will you eliminate Chromate and phosphate?

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

Weight 5 each.

19. What are the postulates of valence bond theory? Explain the geometry of square planar and tetrahedral complexes by taking suitable examples.
20. What are the applications of coordination chemistry in qualitative and quantitative analysis of metal ion?
21. What are aprotic solvent. Explain the reactions in liq. ammonia as a solvent.
22. What are noble gases? Give the preparation and properties of fluorides and oxides of xenon.

(2×5=10 weightage)

