

M.Sc. DEGREE (C.S.S.) EXAMINATION, AUGUST 2016**Second Semester**

Faculty of Science

Branch : Chemistry

AN2 C05/AP2 C05/CH2 C05/PH2 C05/POH2 C05—CO-ORDINATION CHEMISTRY

(Common to all branches of Chemistry)

(2012 Admissions)

Time : Three Hours

Maximum Weight : 30

Section A*Answer any ten questions.**Each question carries a weight of 1.*

1. Discuss briefly the Irving-William order of stability.
2. How does pi donor ligand affect the Δ_0 value ?
3. What are the effects of spin vibronic coupling ?
4. How intramolecular interactions influence the magnetic properties of a complex ?
5. Briefly describe the trans effect theory.
6. What are hard and soft ligands ? How are they characterized ?
7. What are the demerits of Orgel diagram ?
8. What are the reasons for anomalous magnetic moments of complexes ?
9. If d-d transitions in centrosymmetric complexes are forbidden by the Laporte selection rule, why do we see them ?
10. What are the significances of Racah parameters ?
11. What is mean by Nephelauxetic effect ?
12. What are the applications of Trans Effect Theory ?
13. Describe a racemization reaction of a metal complex using an example.

(10 × 1 = 10)

Turn over

Section B

*Answer any five questions.
Each question carries a weight of 2.*

14. Discuss the experimental evidences of π bonding.
15. Briefly describe the splitting of terms in weak and strong tetrahedral fields.
16. Explain the kinetics of octahedral substitution of a metal complex.
17. What are the applications of Cotton Effect in co-ordination chemistry?
18. What are the steps involved in elucidating the structure of cobalt metal complex using electronic spectra.
19. Compare Curie's law and Curie-Weiss law.
20. Briefly explain the use of lanthanide complex as a shift reagent.
21. What are the effects of various couplings in determining selection rules for electronic transitions?

(5 × 2 = 10)

Section C

*Answer any two questions.
Each question carries a weight of 5.*

22. What are electron transfer reactions? What are the different types of mechanisms involved in it?
23. Using the spectral data, explain the steps involved in elucidating the structure of a cobalt complex.
24. What are complexes? How are they classified? Explain the nature and properties of a complex.
25. Compare the coordination chemistry of lanthanides and actinides.

(2 × 5 = 10)