

Exam. Code : 103205

Subject Code : 1351

B.A./B.Sc. 5th Semester

CHEMISTRY

(Inorganic Chemistry-A)

Time Allowed—3 Hours] [Maximum Marks—35

PART—A

Note :— ALL questions are compulsory. Each question carries 1 mark. The maximum length of answer can be 1/3rd of a page.

1. What is significance of $10Dq$?
2. Why the value of Δ_t is always less than that of Δ_o ?
3. What is the sign of magnetic susceptibility χ for paramagnetic and diamagnetic substances?
4. What do you mean by kinetic stability of complexes?
5. Derive the ground state term for d^1 configuration.
6. What is meant by the term microstate?
7. What is an ionic organometallic compound? Give example.
8. What is Wilkinson catalyst? Give its geometry.

PART—B

Note :— Attempt any TWO questions from each section. Each question carries 4.5 marks. The maximum length of answer can be upto 5 pages.

SECTION—I

9. Explain the splitting of a d orbitals of central metal ion in octahedral complexes. Under what conditions tetragonal complexes are formed?

10. What is crystal field splitting ? Discuss the factors which determine the magnitude of crystal field splitting.
11. What are ferromagnetic and antiferromagnetic substances ? Describe the importance of Curie temperature and Neel temperature in the magnetic behaviour of substances.

SECTION—II

12. Derive the spectroscopic terms for d^2 configuration and assign the ground state.
13. What are electronic transitions ? Give the selection rules for d-d transitions. Discuss the electronic spectra of $[Ti(H_2O)_6]^{3+}$.
14. What do you understand by Trans Effect ? Discuss in detail theories of trans-effects.

SECTION—III

15. Discuss preparation, properties, bonding and applications of organoaluminium compounds.
16. What is hapticity ? Give examples of ligands of various hapticities.
17. What is Zeise's salt ? Give its method of preparation, draw its structure and discuss the main features of its bonding.