

Exam. Code : 103205  
Subject Code : 1394

B.A./B.Sc. Semester—V

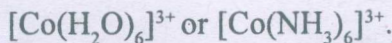
**CHEMISTRY (Inorganic Chemistry—IV)**

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 **ONE-THIRD** of a page.

1. What is the basic assumption of crystal field theory ?
2. Which of the following complexes have large CFS of d-orbitals ?



3. What is Curie temperature ?
4. What is chelate effect ?
5. Define L-S coupling.
6. Why do organolithium compounds tend to oligomerize than exist as single molecule ?
7. What is IUPAC name of the complex  $\text{Ni}(\pi - \text{C}_5\text{H}_5)_2$  ?
8. What is term symbol for  $p^6$  configuration ?

**PART—B**

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

**SECTION—I**

9. Discuss crystal field splitting of d-orbitals in case of tetrahedral complexes and explain why all these are high spin complexes ?
10. What is crystal field stabilization energy ? Calculate CFSE for the following :
  - (i)  $d^5$  strong field octahedral
  - (ii)  $d^7$  weak field octahedral
  - (iii)  $d^6$  tetrahedral
  - (iv)  $d^4$  tetrahedral.
11. What is magnetic susceptibility ? Discuss, how this is measured by Gouy's method.

**SECTION—II**

12. What is meant by the terms : Inert and labile complexes ? Discuss the factors which affect the stability of complexes.
13. What are selection rules for d-d transitions ? Under what conditions these are relaxed ? Discuss why tetrahedral complexes give intense spectra.

14. What are Orgel diagrams ? Give its limitations. Discuss Orgel energy level diagram for  $V^{3+}$  ion.

### SECTION—III

15. What are metal olefin complexes ? Discuss the main features of bonding in these complexes.
16. Discuss preparation, properties and bonding in organoaluminium compounds.
17. What are organometallic compounds ? Discuss in detail classification of organometallic compounds.