

Exam. Code : 103205

Subject Code : 1400

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

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 1/3rd of a page.

1. Define crystal field stabilization energy.
2. What is meant by spectrochemical series ?
3. What is temperature independent paramagnetism ?
4. What is trans effect ?
5. Which out of 3p_2 , 3p_1 and 3p_0 has lowest energy and why ?
6. What are olefin complexes ? Give one example.
7. Why do organolithium compounds tend to oligomerize than exist as single molecule ?
8. What is term symbol for d^{10} configuration ?

PART—B

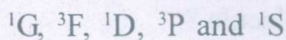
Note :— Attempt any **TWO** questions from each section. Each question carries **4.5** marks. The maximum length of the answer can be upto **5** pages.

SECTION—I

9. Explain the factors on which crystal field splitting depends by giving examples.
10. Discuss crystal field splitting of d orbitals in octahedral, tetrahedral and square planar complexes.
11. What do you understand by the terms : orbital contribution is quenched, partially quenched and not quenched ? Discuss the conditions which should be satisfied to generate orbital contribution to magnetic moment.

SECTION—II

12. Discuss the rate law and mechanism of nucleophilic substitution reactions in square planar complexes.
13. What are Orgel diagrams ? Draw and discuss Orgel diagram for d^1 complexes.
14. Show how one gets the following terms for d^2 configuration :



Which of these belong to ground state ?

SECTION—III

15. What is Wilkinson catalyst ? Give the mechanism of hydrogenation of alkenes by Wilkinson catalyst.
16. What is EAN rule ? Calculate EAN for the following :
- (i) $\text{Fe}(\pi - \text{C}_5\text{H}_5)_2$
 - (ii) $\text{Cr}(\text{CO})_6$
 - (iii) $[\text{Pt}(\text{NH}_3)_5\text{Cl}]^{3+}$.
17. Define organometallic compound. Give structure of complexes in which cyclooctatetraene behaves as 4-electron donor, 6-electron donor and 8-electron donor.