

CS/2110

Paper - I
Inorganic Chemistry

10390/NH

Max. Marks : 26 Marks

Max. Time : 3 hrs

Min. Pass Marks : 35%

Candidates are required to attempt two questions (4 marks each) selecting each from section A & B. Section C is compulsory (2 marks each question).

SECTION - A

1. (a) Calculate the CFSE for the following system: (i) d^6 low spin tetrahedral (ii) d^9 high spin tetrahedral?
(b) Discuss various limitations of valence bond theory?
2. Discuss CFSE and various factors affecting it?
3. Discuss various factors affecting stability of metal complexes?
4. Discuss Trans effect and chelate effect in detail?

SECTION - B

5. Derive relationship between magnetic susceptibility and magnetic moment?
6. Discuss paramagnetism, diamagnetism, ferromagnetism and antiferromagnetism?
7. Find the ground state term for $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$ ion. Comment upon the color of this complex ion?
8. Draw and discuss Orgel energy level diagram for d^1 and d^9 systems?

SECTION - C

9. (a) What are inner orbital complex?
(b) Describe the CFSE in tetragonal complexes?
(c) Differentiate between thermodynamic stability and kinetic stability?
(d) Give advantage of Gouy's method?
(e) Give selection rules for d-d transitions?