SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
M.Sc. Chemistry - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - II

22PCHCT2005 - Coordination Chemistry Bonding, Reaction and Spectra

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Compare and contrast Valence Bond Theory and Crystal Field Theory in their approaches to explaining the bonding in complexes.
2. Explain the Jahn-Teller theorem and provide examples of its manifestations in coordination chemistry.
3. Explain the methods used to determine the stability constants of complexes, including Job's method and spectrometric methods.
4. Compare the acid hydrolysis and Base hydrolysis of an octahedral complexes.
5. What are spinels and inverse spinels, and how do they relate to redox mechanisms?
6. Deduce the term symbol for d2 & d6 configuration in an octahedral field.
7. Draw Orgel diagrams for d1 & d9 ions, showing the energy levels of the d orbitals in an octahedral field.
8. Explain the selection rule for IR and Raman spectra with suitable examples.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Examine π – bond formation of a metal ion with PR_3 ligand on the basis of MO theory.
10. Illustrate the substitution schemes of dissociation and association mechanism for Octahedral complexes.
11. Examine the Innex and Outer sphere mechanism of an complexes with suitable example.
12. Eludicate the structural vibration spectra of mental complexes of urea, cyanide, DMSO.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Sketch and interpret the simplified Sugano-Tanabe diagram of complexes belonging to d2 and d3 system.

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