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 - 2023
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. Illustrate the shapes and magnetic property of four coordinated complexes of Ni^{2+} with reference to VBT.
2. Apply pi-bonding theory and explain the trans effect.
3. Deduce the possible term symbols for Ti^{2+} and mention the microstates in this system.
4. Discuss the vibrational spectra of metal carbonyls.
5. Apply SN^1 mechanism and show that octahedral complexes undergo dissociation via five coordinated intermediate.
6. Assess the effect of π – bonding on the magnitude of Δ.
7. Compare Orgel and Sugano- Tanabe diagram.
8. Analyse the effect of Jahn – Tellar distortion and spin orbit coupling on electronic spectra of complexes.

Section C

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

9. Explain π – bond formation of a metal ion with PR_3 ligand on the basis of MO theory.
10. Assess the mechanism of acid hydrolysis reactions of octahedral complexes with suitable examples.
11. How would you use the group vibrations in the structural elucidation of metal complexes of cyanide, sulphate, & thiocyanates and the effect of isotopes on the vibrational spectra of molecule.
12. Explain the electronic transitions of Cr(III) complexes based on Sugano- Tanabe diagram.

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

13. Analyze the outer sphere mechanism of octahedral complexes with two examples.

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