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.
B.Sc.Chemistry - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - V
22UCHCT5009 - Coordination Chemistry

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

Section B

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

1. Explain the types of structural isomerism observed in coordination compounds with examples.
2. State Sidgwick's Effective atomic number rule and calculate EAN for the following
   i) $[Fe(CN)_6]^{4-}$ ii) $[Pd(NH_3)_6]^{4+}$
3. Explain the Jahn-Teller distortion with examples and mention its consequences.
4. How is the stability constant of a complex determined using Job's and Bjeruum's methods?
5. Derive the spin-only formula for calculating magnetic moments and apply it to a Ti(III) aqueous ion complex.
6. Utilize polarization theory to explain trans effect.
7. Explain the role of EDTA in the estimation of water hardness.
8. Highlight the significance of metal chelates in living system.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Summarize the rules for nomenclature of coordination complexes.
10. Justify why $[Fe(CN)_6]^{3-}$ and $[Fe(CN)_6]^{4-}$ are inner orbital octahedral complexes whereas $[Fe(H_2O)_6]^{2+}$ is an outer orbital octahedral complex based on CFT and explain its magnetic property.
11. Explain the labile and inert behavior of octahedral complexes based on Valence Bond Theory (VBT) and Crystal Field Theory (CFT).
12. Discuss SN^1 and SN^2 reaction mechanisms of octahedral complexes with specific examples.
13. Elaborate the bond formation in metal carbonyl complexes with suitable examples.

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