I B.TECH/21CYB101J/CHEMISTRY

UNIT 1 -QUESTION BANK (Part B & C)

1) Discuss the salient features of CFT
2) Discuss the splitting of d-orbital in octahedral environment
3) Discuss the splitting of d-orbital in tetrahedral environment
4) Discuss the different isomerism exhibited by transition metal complexes
5) Discuss the following periodic properties
   a) Atomic and ionic size
   b) Ionization energy
   c) Electronegativity
   d) Electron affinity
6) Calculate CFSE for the ions d^5,d^6,d^7,d^8,d^9 and d^{10} for weak and strong field octahedral complexes.
7) Calculate μ and CFSE for the ions d^4,d^5, d^6,d^7,d^8,d^9 and d^{10} for tetrahedral complexes.
8) Calculate the magnetic moment μ and CFSE for the following complexes:
   a. $[Ni(H_2O)_6]^{2+}$
   b. $K_4[Fe(CN)_6]$
   c. $[Cr(NH_3)_6]Cl_3$
9) Calculate the effective nuclear charge of the electron in 3p orbital of chlorine atom.
10) Discuss the Spectrochemical series.
11) Discuss low and high spin complexes with examples.
12) Discuss hard and soft acid with examples.
13) Discuss hard and soft base with examples.
14) Discuss magnetic properties of the complexes.
15) Discuss optical properties of the complexes.
16) Arrange the following complexes in the increasing order of wavelength and expalin:
    a. $[Co(NH_3)_6]^{3+}$
    b. $[Co(H_2O)_6]^{3+}$
    c. $[Co(CN)_6]^{3-}$

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