Guess Paper – 2014
Class – XII
Subject – Chemistry *Coordination compound*

1. Write a short note on Werner's theory.
2. Define the terms : a) Coordination polyhedral
   b) Coordination entities
   c) Counter ions, also give one example of each.
3. What do you mean by double salt? How double salt differs from complex?
4. What does the term central atom/ion means? Why central atom/ions are referred as Lewis acid?
5. Describe the term ligand. Give two examples.
6. Define : a) Unidentate ligand
   b) Di-dentate ligand
   c) Polydentate ligand
   d) Ambidentate ligand, also give one example of each.
7. What do you mean by coordination number? What is the coordination number of
   a) $[Fe(C_2O_4)_3]^{3-}$ b) $[Co(en)_3]^{3+}$?
8. Define : a) Coordination sphere
   b) coordination polyhedron
   c) Oxidation number of central atom.
9. Differentiate betweenhomoleptic and hetroleptic complexes. Also give one example of each.
10. What is oxidation number of central atom in $[Co(en)_3]^{3+}$ and $[Ti(H_2O_6)]^{3+}$?
11. Write IUPAC name of following compounds : a) $[Co(H_2NCH_2CH_2NH_2)_3]_2(SO_4)_3$
    b) $Na_3[Co(ox)_3]$
    c) $K_3[Ir(C_2O_4)_3]$
    d) $[Pt(NH_3)_2Cl(NH_2CH_3)]$
    e) $[Pt(NH_3)BrCl(NO_2)]^-$
    f) $K_3[Fe(C_2O_4)_3]$
12. What does the term Chelate ligand describe? Explain by giving an example.
13. What do you mean by denticity? How denticity is related to chilate ligand?
14. What happens when excess of KCN is added to aqueous $CuSO_4$ solution? Why is it that no precipitate of copper sulphide is obtained when H_2S gas is passed through the solution?
15. a.) Define (i) Geometric isomerism and (ii) Optical isomerism.
    b.) What types of isomerism is/are displayed by (i) $[CoCl_2(en)_2]^+$ and (ii) $[Pt(NH_3)(H_2O)Cl_2]$
16. Define following types of isomerism (i) Linkage, (ii) Coordination, (iii) Ionisation and (iv) Solvate isomerism. Also give one example of each.
17. Why is geometrical isomerism possible in tetrahedral complexes having two different types of uni-dentate ligands coordinated with the central metal ion?
18. What do you mean by Chilarity? Give example of chiral molecule.
19. Write a short note on Valence Bond Theory. Also describe its limitations.
20. Write a short note on Crystal Field Theory.
21. a) What does $\blacktriangle_O$ means?
    b) What is the significance of $\blacktriangle_O$ according to Crystal Field Theory?

22. Discuss the nature of bonding in following entities (i) $[Co(C_2O_4)_3]^{3-}$ (ii) $[Fe(F_6)]$ (iii) $[Fe(CN)_6]^{4-}$.
23. What will be the correct order for the wavelength of absorption in the visible region for the following $[Ni(NO_2)_6]^{4-}$, $[Ni(NH_3)_6]^{2+}$, $[Ni(H_2O)]^{2+}$?
24. The spin only magnetic moment of $[MnBr_4]^{2-}$ is 5.9 B.M. . Predict the geometry of complex ion. (Ans. Tetrahedral)
25. Calculate the overall complex dissociation equilibrium constant for the $[Cu(NH_3)_4]^{2+}$ ion, given that β_4 for this complex is 2.1×10^{13} .
26. Using Valence Bond Theory describe the magnetic properties and shape of following (i) $[Ni(NH_3)_6]^{2+}$ (ii) $[Cr(CO)_6]$.

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