B. Sc. (Part-II) Examination 201

Chemistry First Paper
(Inorganic Chemistry)

Note :- Attempt questions from all sections as per instructions.

Section-A (Very Short Answer Type Questions)

Attempt all parts of this question. Give answer of each part in about 50 words. 1x10 =1

1. (i) Give name of element in first transition series which shows + 7 oxidatio state.

   (ii) Why Cu^{++} complexes are coloured while Zn^{++} ions are colourless?

   (iii) Which one is better oxidizing agent in Mn^{3+} and Mn^{4+}?

   (iv) Calculate the value of spin magnetic moment for Ti^{2+} ion.

   (v) Find coordination number of central metal ion in:

   $[Cu\ (NH_3)_4]^{2+}$ and $[Pt\ Cl_3\ (NH_2)]^{2-}$

   (vi) Define chelate with example.

   (vii) Name the isomerism exhibited by the following pairs of complexes:

   $[Pt\ (NH_3)_2\ C\ell_2]Br_2$ and $[Pr\ (NH_3)_2\ Br_2]\ C\ell_2$

   (viii) Why $HC\ell O_4$ is stronger acid than $HC\ell O_3$?

   (ix) Why actinides have greater tendency to form complexes than lanthanid

   (x) Write use of cerric ammonium sulphate in analytical chemistry.

Section-B (Short Answer Type Questions)

Attempt *all* questions. Give answer of each question in about 200 words. 5X5=25

2. What is d-d transition? Explain colour formation in transitional element compl on the basis of this transition.

   Explain why $[Ni\ Cl_2]^{2-}$ is paramagnetic and tetrahedral while $[Ni\ (CN)_4]^{2-}$ is diamagnetic and square planer?

3. Explain Werner theory of coordination with its experimental verification.

   Write the IUPAC name of following complexes:

   (a) $K_3[\ Cr\ (C_2O_4)_3]$

   (b) $[Pt\ (NH_3)_3C\ell_3]^+$

   (c) $[Pt\ (NH_3)_4][PtC\ell_4]$

   (d) $[(NH_3)_4\ CO \underset{OH}{\overset{OH}{\langle\rangle}} CO\ (NH_3)_4]\ SO_4$

   (e) $K_3\ [\ Fe\ (CN)_6]$

4. Write the process of separation for lanthanides by ion exchange and solvent extraction methods. Or
What are trans-Uranic elements? How is plutonium separated from uranium by precipiation methods?
5. What is standard electrode potential? Discuss its applications. Or
Differentiate between calcinations and roasting with examples.
6. Explain Lewis concept of acids and bases with examples. Or
What are Lowery-Bronsted theory of acids and bases? How is it differs form Arrhenius theory?

Section-C (Long Answer type Questions)

Attempt any *two* questions. Give answer of each question in about 500 words. $7^{1/2} \times 2 = 15$

7. Why d-block elements are called as transitional elements? Discuss 4d series of elements on the basis of their electronic configurations. oxidation states complex formations and catalytic activities.
8. Describe the valence bond theory. What are its drawbacks? Differentiate outer and inner orbital complexes with examples.
9. What are lanthanides? Why they are called as rare earth metals? Discuss their electronic configurations and complex formation abilities.
10. What are non-aqueous solvents? Describe their importance. Justify the following reactions in liquid NH_3:
    (a) Acid base reaction (b) Complex formation (c)Redox reactions
11. Write short notes on the following:
    (a) Geometrical isomerism in co-ordination compounds.
    (b) Solvent system concept of acids bases.
    (c) Effective atomic number and its applications.