



Eastern University, Sri Lanka

Second Year First Semester Examination in Science

2008/2009 (February 2010)

CH 201 COORDINATION CHEMISTRY AND MAIN
GROUP CHEMISTRY

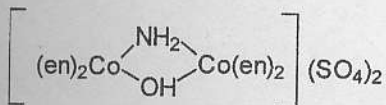
(Proper)

Answer all questions

Time : 01 hour

1. (I) Give the Oxidation State, d-orbital occupation, co-ordination number and expected magnetic moment of the central metal ion/ions in the following complexes.

- $\text{K}[\text{Cr}(\text{oxal})_2(\text{H}_2\text{O})_2] \cdot 3\text{H}_2\text{O}$
- $\text{CrCl}_3(\text{py})_3[\text{Co}(\text{en})_3]\text{Cl}_3$
-



(60 marks)

(II) Write the molecular formula of the following compounds.

- Triamminetrichlorocobalt(III)
- Hexaamminecobalt(III)chloride.sulphate
- Decammine- μ -amidodicobalt(III) nitrate
- Trans-dichlorobis(ethylenediamine)cobalt(II) ion

(40 marks)

2. a. Draw a labeled diagram to show how the energies of d – orbitals are affected by a square planer arrangement of ligands. (30 marks)
- b. By using Crystal Field Theory explain; the hexaquo manganese(II) ion contains five unpaired electrons, while the hexacyano- ion contains only one unpaired electron.

(20 marks)

Turn Over

c. What are the CFSE for the following complex systems and state whether para magnetism or dia magnetism.

- i. d^5 low spin octahedral complex
- ii. d^8 high spin octahedral complex
- iii. d^6 tetrahedral complex

(30 marks)

d. List out five uses of hydrogen.

(20 marks)

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