



EASTERN UNIVERSITY, SRI LANKA
FIRST SEMESTER SECOND EXAMINATION IN SCIENCE
2006/2007 (Dec.2008)

CH 201 COORDINATION CHEMISTRY AND MAIN GROUP CHEMISTRY

Time: One hour
Answer all questions

You may find the following data useful

Atomic number for I – 53, Cr -24, Co – 27, Al -13

1)

a) Write the IUPAC name of the following compounds.

- i) $[\text{Al}(\text{OH})(\text{H}_2\text{O})_5]^+$
- ii) $\text{NH}_4[\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]$
- iii) $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$
- iv) $\text{Na}[\text{CoCl}_4(\text{NH}_3)_2]$

(28 marks)

b) Write the molecular formula of the following compounds.

- i) Pentaamminenitritocobalt(III) nitrate
- ii) Hexaamminecobalt(III) chloride.sulphate
- iii) Lithium tetrahydridoaluminate(III)
- iv) Pentaamminechlorocobalt(III) ion

(28 marks)

c)

i) What are the main assumptions in Crystal Field Theory?

(12 marks)

ii) Draw a labeled diagram to show how the energies of d – orbitals are affected by an octahedral arrangement of ligands.

(20 marks)

iii) The magnetic moment of an octahedral Co(II) complex is $4.0 \mu_B$. What is its electronic configuration?

(12 marks)

- 2)
- a) i) Draw the geometrical isomer of the following compounds



- ii) Which of the above isomer/s optically active? And draw the mirror image/s of the isomer/s

(30 marks)

- b) Explain the quenching of orbital contribution to the magnetic moment of transition metal complex.

(30 marks)

- c) Hydrogen can be placed with alkali metals or with halogens. Give four reasons for each and explain why it is placed in period I.

(25 marks)

- d) Draw the structure of IF_5 . Give reason/s.

(15 marks)
