

Uva Wellassa University, Sri Lanka
Faculty of Science and Technology
Science and Technology Degree Program
200 Level 1st Semester Examination July/August 2016
SCT 231-1 Inorganic Chemistry



Instructions to candidates

Number of questions: Two (02)

Answer all questions

Time allocation: One (01) hour

Total marks allocated: 200

Scientific calculators are allowed, Periodic tables are not allowed

1. Mn^{3+} mostly forms octahedral complexes. Suggest the energy diagram of $[\text{Mn}(\text{H}_2\text{O})_6]^{3+}$ and $[\text{Mn}(\text{CN})_6]^{3-}$ using crystal field theory.

i. a. Calculate the total spin number and crystal field stabilizing energy for each case.

b. Calculate the total spin number and crystal field stabilizing energy of the compounds, once irradiated from visible light.

ii. a. Derive the following equation starting from total magnetic momentum of coordination compound metal ion, $\mu_{spin} = \sqrt{n(n+2)}$ where n is number of unpaired electrons.

b. Calculate the μ_{spin} for the high spin compound composed from Mn^{+2} ions.

(100 marks)

2. Explain why $\text{Au}(\text{II})$ is unstable than $\text{Cu}(\text{II})$ using Jahn-Teller effect.

(100 marks)

