Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY
(DAC 11M)

ACH 2305: CHEMISTRY OF TRANSITION ELEMENTS

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: OCTOBER 2013

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this paper
- *Answer booklet*

This paper consists of ***FIVE*** questions.
Answer Question **ONE (compulsory)** and any other **TWO** questions
*This paper consists of **2 PRINTED** pages*

Question ONE

a) Explain why $[CoCNH_3)_6]^{3+}$ **(4marks)**
b) State any FOUR industrials uses of complexes compounds **(4marks)**
c) State FOUR ways in which MOO_3 and WO_3 differ from CrO_3 **(4marks)**
d) State any FOUR uses of MnO_2 **(4marks)**
e) Transition elements end b-block elements are two terms that are easily confused.
   (i) Using appropriate dedination explain why Zn and Sc and not transitions metals **(4marks)**
   (ii) What would be the oxidation state of the ions of SC and Zn **(9marks)**
f) Differentiate between paramagnetisim and diamagnestion **(4marks)**
g) Explain how ionic radius influences covalent or ionic nature of a compound **(4marks)**

Question TWO

Describe the sulphate process for the manufacture of pigment grade $T10_2$ and explain why $T10_2$ has replaced white lead as paint pigment buse. **(15marks)**

Question THREE

a) Name the following compounds **(10marks)**
   (i) $[N1(CN)_4]^{2-}$
   (ii) $[Cu(H_2O)]^{2+}$
   (iii) $[Fe(CN)_6]^{3-}$
   (iv) $[Ni(NH_3)_6]^{3+}$
   (v) $[Co[H_2O)_6]^{3+}$
b) State FIVE characteristic of stable compounds **(5marks)**

Question FOUR

a) State any SIX method used to prevent rusting of iron metal **(6marks)**
b) State any FIVE sulphine uses of iron **(5marks)**
c) Define the following terms
   (i) Ligands **(2marks)**
   (ii) Transition elements **(2marks)**

Question FIVE

a) Discuss three method involved in phyrometalhersy **(12marks)**
b) Explain why second ionization energy is greater thin firm ionization energy **(3marks)**