



KENYATTA UNIVERSITY EXAMINATIONS 2010/2011
OPEN, DISTANCE AND E-LEARNING
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
SCH 400: COMPARATIVE STUDY OF TRANSITION ELEMENTS

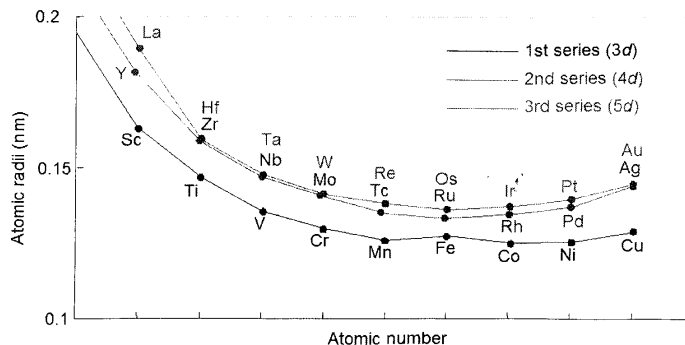
DATE: FRIDAY 8TH JULY 2011

TIME: 2.00 P.M. – 4.00 P.M.

INSTRUCTIONS

Attempt ALL questions

1. Zinc, Cadmium and mercury may neither be classified as true d-block elements nor transition elements. Discuss.
(6 marks)
2. Give possible explanations for the following observations in the properties of transition metal elements or their compounds
 - a) The highest oxidation states of the elements of the first transition series reach a maximum at Mn and not Zn.
(4 marks)
 - b) High oxidation state halides of the transition metals tend to be polymeric and covalent.
(3 marks)
 - c) The oxidizing power of the oxoanions CrO_4^{2-} , MoO_4^{2-} , and WO_4^{2-} vary in the order $\text{CrO}_4^{2-} > \text{MoO}_4^{2-} > \text{WO}_4^{2-}$.
(4 marks)
 - d) Classify the following oxides as basic, amphoteric or acidic: CrO , Cr_2O_3 , CrO_2 , and CrO_3 . Explain your order. Explain why lanthanides do not form high oxidation state oxides such as MO_3 even though their ionization energies are not so high.
(8 marks)
3. Draw the structure of the cluster units
 - a) Re_3Cl_9
 - b) $[\text{W}_6\text{Cl}_8]^{4+}$Discuss the bonding in $[\text{W}_6\text{Cl}_8]^{4+}$
(10 marks)
4. Study the diagram below and answer the questions that follow?



Question Five

- a) Given CES production function as $Q = A(aL^{-\rho} + bK^{-\rho})^{-\frac{1}{\rho}}$, derive the elasticity of substitution for function. (10 marks)
- b) Given Hicksian demand function as $x_1 = \sqrt{\frac{P_2 U}{P_1}}$ and $x_2 = \sqrt{\frac{P_1 U}{P_2}}$, derive the expenditure function, state and check the properties of the expenditure function. (10 marks)