NAME.....

ADM.NO..... CLASS..... DATE.....

233/3
CHEMISTRY
PAPER 3
PRACTICAL
2 ¼ HOURS

ALLIANCE HIGH SCHOOL
PRE-TRIAL EXAMINATION FOR

KENYA CERTIFICATE OF SECONDARY EDUCATION 2015

INSTRUCTIONS TO CANDIDATES

Answer All questions in the spaces provided in this question paper.
You are NOT allowed to start working with the apparatus for the 15 minutes of the 2 ¼ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.
All working must be clearly shown where necessary.
Mathematical tables and electronic calculators may be used.

For Examiner's use only.

Questions	Maximum Score	Candidates Score
1	12	
2	8	
3	20	
Total	40	

1. You are provided with solution X containing 9.8g $(NH_4)_2 SO_4 . FeSO_4 . 6H_2O$ in $250cm^3$ of solution.

- Solution Y containing 3.16 of potassium manganate (VII) in a litre of solution. You are required to determine the ratio of reaction of manganate (VII) ion $Mn0_4^-$) with iron (II) ions Fe^{2+}.

Procedure I

(i) Fill the burette with solution Y

(ii) Using a pipette and pipette filler place 25cm of solution X in a conical flask.

(iii) Titrate solution X using solution Y while shaking the conical flask until the pink colour appears. Record the results in the table below.

(iv) Repeat the titration two more times and complete the table.

	I	II	III
Final burette reading			
Initial burette reading			
Volume of solution Y used.			

(4 mks)

i) Calculate the average volume of solution Y. (1 mk)

ii) Calculate the molarity of solution Y. (1 mk)

iii) Calculate the molarity of solution X (2 mks)

iv) Calculate the number of moles of solution X used in titration. (1 mk)

v) Calculate the number of moles of solution Y. (1 mk)

vi) Calculate the number of moles of Fe^{2+} that reacts with one mole of $Mn0_4$ in given that one mole of$(NH_4)_2 SO_4 . FeSO_4 . 6H_2O$ gives one mole of Fe^{2+} ions and one mole potassium manganate (VII) gives one mole of MnO_4^- ion.

(2 mks)

(K=39,Mn=55,0=16,N=14,S=32,H=1)

2. You are provided with 1.0M sodium hydroxide as solution B and 0.5M sulphuric (VI) acid as solution A. You are required to determine molar heat of neutralisation between the acid and base.

Procedure II

(i) Measure 25cm^3 of solution B using a measuring cylinder and place it into a plastic beaker. Determine its steady temperature and record.

(ii) Clean the measuring cylinder and measure 25cm^3 of solution A. Determine its steady temperature and record.

(iii) Place all solution A into a beaker containing solution B. stir the mixture and determine the highest temperature of the mixture.

Temperature of solution B _____
Temperature of solution A _____
Temperature of mixture _____

(2 mks)

a) Determine the change in temperature which occurs in the above reaction. (1 mk)

b) Calculate the heat change that occurs during the reaction. (3 mks)

c) Calculate the molar heat of neutralisation. (2 mks)
Specific heat capacity of mixture = 4.2kJ/kg/k density of mixture = 1g/cm^3

3 A) You are provided with solid F. You are required to carry out the experiment below and write down the observations and inferences.

a) Put a spatula full of solid F in a text tube and heat strongly.

Observations	Inferences

(1 mk) (1 mk)

b) Dissolve the remaining solid F into about $10cm^3$ of distilled water. Divide the solution into four portions.

i) To the 1st portion add sodium hydroxide dropwise till in excess.

Observations	Inferences

(1 mk) (1 mk)

ii) To the 2nd portion add ammonia solution drop wise till in excess.

Observations	Inferences

(1mk) (1 mk)

iii) To the 3rd portion add about $2cm^3$ of lead (II) nitrate solution.

Observations	Inferences

(1 mk) (1 mk)

iv) To the 4th portion add about $2cm^3$ of Barium nitrate solution.

Observations	Inferences

(1 mk) (1 mk)

3. B) You are provided with solid H. Carry out the tests below. Write your observations and inferences in the spaces provided.

a) Using a clean metallic spatula, heat about one third of solid H in a Bunsen burner flame.

Observations	inferences

(1 mk) (1 mk)

b) Dissolve the remaining portion of solid H into about $10cm^3$ of distilled water and divide the solution into 4 portions.

i) To the 1st portion, add three drops of acidified potassium manganate VII solution and warm.

Observations	Inferences

(1 mk) (1 mk)

ii) To the second portion add three drop of bromine water and warm.

Observations	inferences

(1 mk) (1 mk)

iii) To the 3rd portion sodium carbonate

Observations	Inferences

(1 mk) (1 mk)

iv) To the 4th portion determine the PH using universal indicator paper.

Observations	Inferences

(1 mk) (1 mk)