Candidate's Name .....

Signature .....

Random No.					*Personal No.*		

CHEMISTRY

(***PRACTICAL***)

***PAPER* 3**

2 *Hours*

Uganda Certificate of Education

RESOURCE MOCK EXAMINATIONS – 2019

CHEMISTRY PRACTICAL

***Paper* 3**

2 *hours*

INSTRUCTIONS TO CANDIDATES:

Answer **both** questions. Answers are to be written in the spaces provided in this booklet. Use **blue** or **black** ink ball pen only. Any work done in **pencil** will not be marked except drawings.

You are **not** allowed to use reference books (i.e. text books, booklets on qualitative analysis etc)

All working must be clearly shown.

Mathematical tables and silent non-programmable calculators may be used.

For Examiners' use only			
Q.1			
Q.2			
Total			

1. You are provided with the following:
   BA1 containing **10.0g** of sodium hydroxide solution in **250cm^3** of solution.
   BA2 is hydrochloric acid solution.
   You are required to determine the concentration of hydrochloric acid in moldm^{-3}.
   Procedure:
   (a) Using a 100cm^3 measuring cylinder, measure **50cm**^{3} of **BA2** and top up to the mark using distilled water and label it **BA3.**
   (b) Pipette 25cm^3 (or 20cm^3) of **BA1** into a plastic beaker and record its initial temperature**, t_1**(℃)**.**
   (c) Measure and record the initial temperature of **BA3**, **t_2(℃).**
   (d) Using a burette, run 5cm^3 of **BA3** into **BA1** in the plastic beaker. Record the maximum temperature attained by the mixture, **t_3(℃).**
   (e) Without pouring the mixture in **(d)** above, repeat procedure **(d)** for values of **BA3**=10, 15, 20, 25, 30, 35 and 40cm^3.
   (f) Record your results in the table below.
   Volume of pipette used……cm^3

   Initial temperature of **BA1**, t_1…….. (℃)

   Initial temperature of **BA3**, t_2..... (℃)

   Average initial temperature ……..…… (℃)

Volume of BA3 added(cm^3)	5	10	15	20	25	30	35	40
Temperature of the solution,t_3(℃)								
Temperature change (℃)								

Questions:

(a) Plot a graph of temperature change against volume of **BA3** added.

(b) From the graph, determine;

i. Maximum temperature change.

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ii. Volume of **BA3** required to neutralize **BA1**.

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(c) Calculate the ;

i. Molarity of **BA1**. (Na=23, O=16, H=10)

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ii. Moles of **BA3** that reacted.

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iii. Concentration of hydrochloric acid in moldm^{-3} of solution.

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(d) Explain why a plastic cup is used other than a glass or metallic beaker.

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2. You are provided with substance **G** that contains **two cations** and **one anion**. Carry out the following tests on **G** to identify the cations and the anion. Identify any gas (es) evolved. Record your observations and deductions in the table below. (25marks)

Tests	**Observations**	**Deductions**
(a) Heat one spatula end-ful of **G** strongly in dry test tube.		

(b) Dissolve two spatula endfulls of **G** in about $5cm^3$ of dilute nitric and heat. Cool the solution for about 2 minutes. To the resultant solution add dilute sodium hydroxide solution drop wise until in excess. Filter and keep both the filtrate and the residue.		
(c) To the filtrate add dilute nitric acid until the solution is **just acidic**. Divide the acidic solution into **4** portions.		
i. To the first portion add dilute sodium hydroxide drop wise until in excess.		
ii. To the second portion aqueous ammonia drop wise until in excess.		
iii. To the third portion add lead(II) nitrate solution and warm.		
iv. To the fourth portion, carry out a test of your own choice to identify the anion in **G**.		

(d) Wash the residue with dilute sodium hydroxide solution and dissolve it in about $5cm^3$ of dilute nitric acid. Divide the resultant solution into **3** portions.		
i. To the first portion add sodium hydroxide solution drop wise until in excess.		
ii. To the second portion add aqueous ammonia solution drop wise until in excess.		
iii. To the third portion add a piece of magnesium ribbon, shake and allow to stand.		

Identify;

i. Cations in **G**.

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ii. Anion in **G**

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END

Confidential

Each candidate will require;

1 burette (50ml)

1 pipette 25.0ml (or 20.0ml)

1 measuring cylinder (100ml)

6 test tubes

60ml of ***BA1***

80ml of ***BA2***

3g of solid ***G***

2 empty beakers.

thermometer

1 filter paper.

Easy access to:

-heat source.

-Reagents for identifying cations and anions and gases.

-distilled water.

BA1 *is prepared by dissolving 40.0g of sodium hydroxide to make one litre of solution*

BA2 *is prepared by diluting 172cm^3 of concentrated hydrochloric acid to make one litre of solution.(2M HCl)*

G *is a mixture of Copper(II) oxide+ Zinc sulphate in the ratio of 1:2 respectively.*