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 100cm³ measuring cylinder, measure **50cm**³ of **BA2** and top up to the mark using distilled water and label it **BA3**.
- (b) Pipette 25cm³ (or 20cm³) of **BA1** into a plastic beaker and record its initial temperature, $\mathbf{t_1}(^{\circ}\mathbf{C})$.
- (c) Measure and record the initial temperature of **BA3**, $t_2(^{\circ}C)$.
- (d) Using a burette, run 5cm^3 of **BA3** into **BA1** in the plastic beaker. Record the maximum temperature attained by the mixture, $\mathbf{t_3}(^{\circ}\mathbf{C})$.
- (e) Without pouring the mixture in (d) above, repeat procedure (d) for values of **BA3**=10, 15, 20, 25, 30, 35 and 40cm³.

Average initial temperature(°C)

Volume of	5	10	15	20	25	30	35	40
BA3								
added(cm ³)								
Temperature								
of the								
solution,t ₃ (°C)								
Temperature								
change (°C)								

Questions:

(a) Plot	a graph of temperature change against volume of BA3 added.
(b) Fron	n the graph, determine;
i.	Maximum temperature change.
ii.	Volume of BA3 required to neutralize BA1 .
(c) Calc	ulate the;
i.	Molarity of BA1 . (Na=23, O=16, H=10)
ii.	Moles of BA3 that reacted.

	iii.	iii. Concentration of hydrochloric acid in moldm ⁻³ of solution.			
d)	Expla	in why a plastic cup is used other than a glass or metallic beaker.			
2.	You a	re 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.			
	Identi	fy any gas (es) evolved. Record your observations and deductions in the			
	table l	pelow. (25marks)			

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

(b)	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 .	

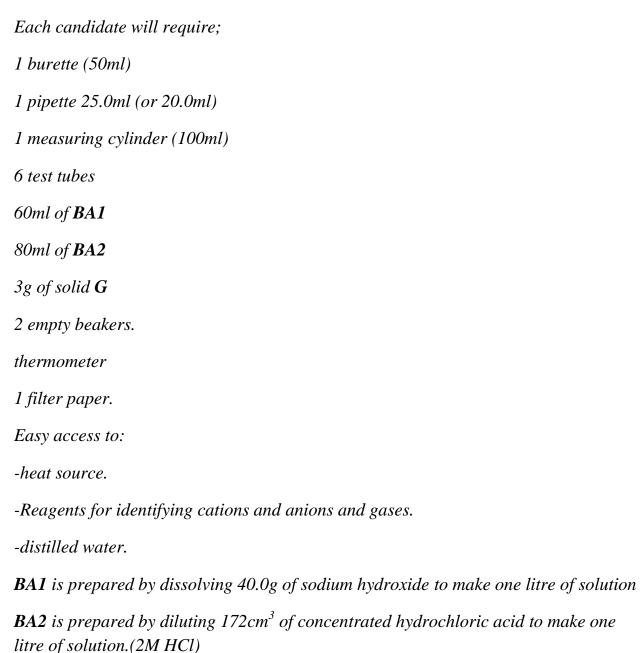
(d) Wash the residue with dilute sodium hydroxide solution and dissolve it in about 5cm³ of dilute nitric acid. Divide the resultant solution into 3 portions.	
i. To the first portion add sodium hydroxide solution drop wise until in excess.	
ii. To the second portion add aqueous ammonia solution drop wise until in excess.	
iii. To the third portion add a piece of magnesium ribbon, shake and allow to stand.	
Identify; Cations in G .	
Anion in G	

END

i.

ii.

Confidential



 ${\it G}$ is a mixture of Copper(II) oxide+ Zinc sulphate in the ratio of 1:2 respectively.