

Candidate's name:Index No.....

Signature:..... School:

545/3

Chemistry

(Practical)

Paper 3

July/August 2019

2hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

Uganda Certificate of Education

CHEMISTRY (PRACTICAL)

PAPER 3

2HOURS

INSTRUCTIONS TO CANDIDATES:

- Answer **both** questions. Answers are to be written in the spaces provided in this booklet.
- You are **not** allowed to use any 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 which is a 1M solution of an acid **Q**.

R, which is a solution of a basic compound **Y**

You are required to determine the mole ratio of the reaction between **Q** and **Y**.

Procedure

- (a) Measure 60cm³ of **R** using a measuring cylinder and transfer into the 250ml glass beaker. Add about 60cm³ of distilled water and stir to mix well. Label the solution BA2.
- (b) Fill the burette with BA1; run 30cm³ into plastic beaker, measure and record the initial temperature T_o
- (c) Using a measuring cylinder, transfer 5cm³ of BA2 into the plastic beaker. Stir the mixture using the thermometer and record the maximum temperature **T** reached by the mixture. Wash both the thermometer and the plastic beaker and dry them.
- (d) Repeat procedures (b) and (c) using the sets of volumes of BA1 and BA2 indicated in the table below.
- (e) Record in the same table, the values of T_o , **T** and $\Delta T = T - T_o$ for each experiment.

(09marks)

Experiment number	1	2	3	4	5	6
Volume of BA1 (cm ³)						
Volume of BA2 (cm ³)						
Initial temperature $T_o(^{\circ}\text{C})$						
Maximum temperature $T(^{\circ}\text{C})$						
$\Delta T = T - T_o (^{\circ}\text{C})$						

Question

(a)(i) Why do we have to use a plastic during this experiment? (01mark)

.....

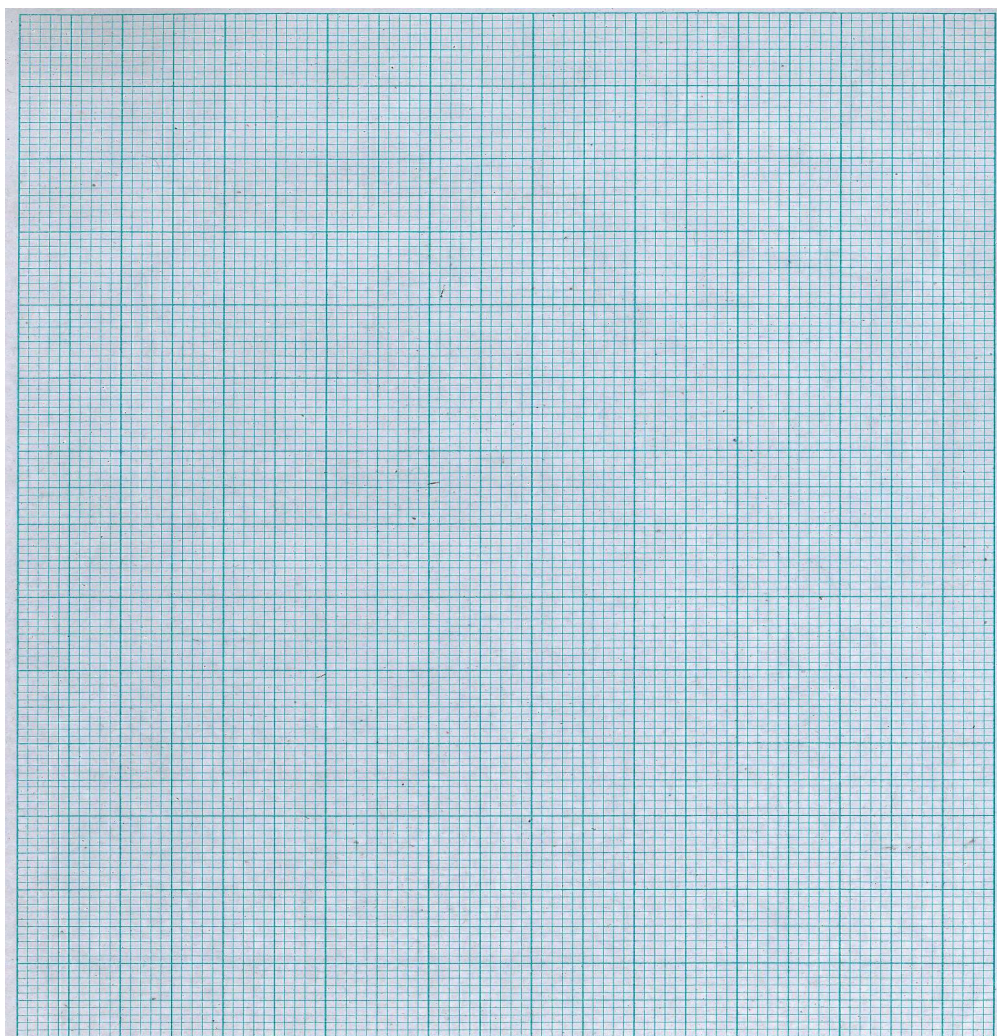
.....

(ii) State whether the reaction is exothermic or endothermic? (01mark)

.....

.....

(b) Plot a graph of ΔT (along the vertical axis) against volume of BA1 (along the horizontal axis) (09marks)



(c) From the graph, determine the

(i) maximum value of ΔT (01mark)

.....

.....

.....

.....

(ii) corresponding volumes of BA1 and BA2 that gave the maximum value of ΔT . (02marks)

.....

.....

.....

.....

(d) Calculate the mole ratio of the reaction between **Q** and **Y**. (04marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

2. You are provided with substances **K** which contains two cations and one anion. You are required to identify the cations and anions in **K**. Carryout the following test on **K** to identify the cations and anions. Identify any gases evolved. (25marks)

TESTS	OBSERVATION	DEDUCTION
a) Heat one spatula endful of K in a hard glass test tube strongly until there is no further change.		
b) To two spatula endful of K add dilute nitric acid until there is no further change. To the resultant solution add ammonia solution dropwise until in excess and filter. Keep the residue for part (d)		
c) To the filtrate add dilute nitric acid until the solution is just acidic. Divide the resultant solution into three portions.		
(i) To the first portion add sodium hydroxide solution dropwise until in excess.		
(ii) To the second portion add 2-3 drops of dilute sulphuric acid.		
(iii) To the third portion add ammonia solution dropwise until in excess.		

d) Dissolve the residue in dilute nitric acid. Divide the resultant solution into four portions.		
(i) To the first portion add sodium hydroxide solution dropwise until in excess.		
(ii) To the second portion add ammonia solution dropwise until in excess.		
(iii) To the third portion add 3-4 drops of dilute sulphuric acid and warm.		
(iv) Use the fourth portion to carryout a test of your own choice to confirm the second cation in K .		

(e) Identify the;

(i) cation in K

(ii) Anion in K:

END