Name.....

School..... Centre/Index No.....

Signature.....

545/3
CHEMISTRY
(PRACTICAL)
Paper 3
July/August 2023
2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

CHEMISTRY PRACTICAL

Paper 3

2 hours

INSTRUCTIONS TO CANDIDATES.

- *Answer **both** questions. All answers must be written in the spaces provided.*
- *You are **not** allowed to use any reference books (i.e text books or handouts on qualitative analysis etc).*
- ***All working must be clearly shown.***
- *Mathematical tables and silent non-programmable scientific calculators may be used.*

For Examiner's use only		
Q.1	**Q.2**	**Total**

Turn Over

1. You are provided with the following:

BA1, which is a solution containing 20.0 g/dm^3 of unknown hydrated salt, $RCO_3.xH_2O$.

BA2, which is a 0.2 M hydrochloric acid.

You are required to determine the number of Moles of water of crystallization, x, in $RCO_3.xH_2O$ and the percentage of the anhydrous salt, RCO_3.
(1 mole of hydrated salt reacts with 2 moles of hydrochloric acid)

Procedure

Pipette 25.0 cm^3 (or 20.0 cm^3) of **BA1** into a clean conical flask using a clean pipette.
Add 2-3 drops of Methyl orange indicator and titrate it with **BA2** from the burette.

Repeat the procedure above until you obtain consistent results.

Record your results in the table below.

Results;
Volume of pipette used = ... (cm^3) (½mark)

	1	2	3
Final Burette reading (cm^3)			
Initial Burette reading (cm^3)			
Volume of **BA2** used (cm^3)			

(7½ marks)

Titre values of **BA2** used to calculate the average volume.

.....

.....(cm^3) (½mark)

Average volume of **BA2** used.

.....

.....(cm^3) (2½mark)

(a) Calculate;

(i) the number of moles of **BA2** that reacted. (03 marks)

.....

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(ii) the concentration of the hydrated salt, $RCO_3.xH_2O$, in Moles per dm^3. (03 marks)

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.....

(iii) the relative formula mass of the dehydrated salt, $RCO_3.xH_2O$. (03 marks)

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(b) Determine the;

(i) the value of x, in $RCO_3.xH_2O$. (02 marks)

[R = 46, O = 16, C = 12, H = 1]

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(ii) the percentage of the anhydrous salt RCO_3. (03 marks)

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2. You are provided with substance **Q** which contains **two** cations and a common anion.
Carry out the following tests on **Q** to identify the cations and anion present. Identify any gas(es) evolved.
Record your observations and deductions in the table below. (23½ marks)

TEST	OBSERVATION	DEDUCTION
(a) To **one** spatula endful of Q in a clean test tube, add 4 cm^3 of distilled water and shake well. Filter and keep both the filtrate and residue. Divide the filtrate into **three** equal portions. (1 cm^3 each)		

Turn Over

(i) To the **first** portion add aqueous ammonia drop wise until in excess.		
(ii) To the **second** portion add aqueous sodium hydroxide drop wise until in excess and warm.		
(iii) To the remaining portion of the filtrate, add 3 drops of Lead (II) nitrate solution followed by dilute nitric acid solution drop by drop until in excess.		
(b) Add dilute Nitric acid to the residue until it dissolves. Divide the resultant solution into **four** equal portions.		
(i) To the **first** portion add aqueous sodium hydroxide 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 3 drops of dilute hydrochloric acid solution. Warm the mixture, then allow to cool under water.		
(iv) Use the **fourth** portion to carry out a test of your own choice to confirm the cation in the residue.		

(e) Identify the ions in Q;

(i) Cations :..... and ..... (01 mark)

(ii) Anion ..... (½ mark)

END