

CANDIDATE'S NAME.....

CENTRE / INDEX NO: ...../.....SIGNATURE: .....

545/4

CHEMISTRY

(PRACTICAL)

Paper 4

July- August 2023

2 ¼ hours



## KAMSSA JOINT MOCK EXAMINATIONS

Uganda certificate of education

CHEMISTRY

PAPER 4

2 ¼ hours

• INSTRUCTIONS TO CANDIDATES:

- Answer **all** questions
- Record your answers on this question paper in the spaces provided.
- Mathematical tables and silent non- programmable calculators may be used.
- Reference books (i.e. text books, books on qualitative analysis, etc) should not be used.
- Candidates are **not** allowed to start working with the apparatus for the first 15 minutes. This time is to enable candidates to read the question paper and make sure they have all the apparatus and chemicals that they may need.

FOR EXAMINER'S USE ONLY			
Q.1			
Q.2			
Total			

1. You are provided with the following;

**BA<sub>1</sub>** which is a solution containing a carbonate **Y<sub>n</sub>CO<sub>3</sub>** made by dissolving 7.42 g in a litre.

**BA<sub>2</sub>** which is **0.2 M** hydrochloric acid solution.

**You are required to determine the value of n in Y<sub>n</sub>CO<sub>3</sub>.**

**Procedure:**

Pipette 20 or 25.0 cm<sup>3</sup> of **BA<sub>1</sub>** into a clean conical flask.

Add 2-3 drops of phenolphthalein indicator and titrate the solution with **BA<sub>2</sub>** from the burette until the end point is reached.

Repeat the titration to obtain consistent results.

Record your results in the table below.

**Results:**

Volume of pipette used ..... cm<sup>3</sup>. (½ Marks)

Titration Number	1	2	3
Final Burette Reading (cm <sup>3</sup> )			
Initial Burette Reading (cm <sup>3</sup> )			
Volume of <b>BA<sub>2</sub></b> used (cm <sup>3</sup> )			

(07 ½ Marks)

Titre values used to calculate the average volume of **BA<sub>2</sub>**. (01 Mark)

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Average volume of **BA<sub>2</sub>** used (2 ½ Marks)

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**Questions:**

(a) Calculate the number of moles of;

(i) **BA<sub>2</sub>** that reacted. (02 Marks)

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(ii)  $Y_nCO_3$  in 1000 cm<sup>3</sup> of solution of  $BA_1$ . (1 mole of  $Y_nCO_3$  reacts with 2 moles of hydrochloric acid). (03 Marks)

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(b) Determine (i) the molar mass of  $Y_nCO_3$ . (05 Marks)

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(ii) Value of n in  $Y_nCO_3$ . (Y = 38, C = 12, O = 16). (02 Marks)

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2. You are provided with substance **Q** which contains two cations and one anion. Carry out the following tests on **Q**. Identify any gas(es) involved and record your observations in the table below. (25 marks)

No:	TEST	OBSERVATION	DEDUCTION
(a)	Heat one spatula endful of <b>Q</b> strongly until there is no further change		

(b)	Dissolve <b>two</b> spatula endful of <b>Q</b> in about <b>3cm<sup>3</sup></b> of water. To the mixture add ammonia solution dropwise until in excess. Filter and <b>keep both</b> the filtrate and the residue		
(c)	To the filtrate, add dilute nitric acid dropwise until the solution is just acidic. Divide the solution into <b>five</b> portions.		
(i)	To the <b>first</b> portion of the acidified solution, add 2-3 drops of lead (ii) nitrate solution.		
(ii)	To the <b>second</b> portion of the acidified solution, add 2-3 drops of silver nitrate solution		
(iii)	To <b>third</b> portion of the acidified solution add 2-3 drops of barium nitrate solution		

(iv)	To the <b>fourth</b> portion of the acidified solution, add dilute sodium hydroxide solution dropwise until in excess.		
(v)	To the <b>fifth</b> portion of the acidified solution, add ammonia solution dropwise until in excess		
(d)	Wash the residue with distilled water and dissolve it with dilute sulphuric acid. Divide the resultant solution into <b>three</b> portions.		
(i)	To <b>first</b> portion of the solution, add dilute sodium hydroxide solution dropwise until in excess		
(ii)	To the <b>second</b> portion of the solution, add ammonia solution dropwise until in excess.		

(iii)	To the <b>third</b> portion of the solution, add 2-3 drops of potassium iodide solution.		
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(a) (i) Cations in **Q** .....and.....

(ii) Anion in **Q** .....

**END**