NAME:……INDEX NO:……

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CHEMISTRY PRACTICAL
PAPER 3
2 HOURS

DEPARTMENT OF CHEMISTRY

UGANDA CERTIFICATE OF EDUCATION
INTERNAL MOCK EXAMINATIONS

S.4 CHEMISTRY PRACTICAL

PAPER 3
TIME: 2 HOURS

Instructions:

- **Attempt ALL questions in this paper.**
- **Answers must be written in the spaces provided**
- **Where possible use the following:**
  $(\boldsymbol{C = 12}, \quad \boldsymbol{H = 1}, \quad \boldsymbol{O = 16})$

FOR EXAMINER'S USE ONLY	
Qn 1	
Qn 2	
Total	

1. You are provided with the following:

BA1 which is 0.1M Sodium hydroxide solution.
BA2 which is a solution made by dissolving 4.5g of an acid $H_2(COO)_n$ in water to make 1 litre of solution. Phenolphthalein indicator.

You are required to determine the value of $\boldsymbol{n}$ in the formula of the acid.
(BA1:BA2 mole ratio is 2:1)

Procedure.
Pipette $25cm^3 (or\ 20\ cm^3)$ of BA2 into a conical flask, add 2-3 drops of phenolphthalein indicator and titrate with BA1 from the burette. Repeat the titration until you obtain consistent results. Record your results in the table below:

Results
Volume of pipette used…… cm^3

Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of BA1 used (cm^3)			

Volumes of BA1 used to calculate the average volume.

……..

Average volume of BA1.

……

……

Calculate the:

(i) number of moles of Sodium hydroxide in BA1 used

……

……

……

(ii) molarity of BA2

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(iii) value of $\boldsymbol{n}$ in $H_2(COO)_n$

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2. You are provided with substance ***J*** which contains two cations and one anion. You are required to identify the cations and anion in $\boldsymbol{J}$. Carryout the following tests on $\boldsymbol{J}$ and identify any gas(es) evolved. Record your observations and deductions in the table below.

	Test	***Observation***	***Deduction***
(a)	Heat two spatula endfuls of J in a dry test tube and allow the residue to cool. Keep the residue.		
(b)	Add 4 – 5 drops of dilute hydrochloric acid to a spatula endful of $\boldsymbol{J}$ in a test tube.		
(c)	Dissolve the residue in (a) in dilute hydrochloric acid. Add dilute sodium hydroxide solution dropwise until there is no further change then filter. Keep both the filtrate and the residue.		
(d)	To the filtrate add dilute hydrochloric acid dropwise until the solution is just acidic. Divide the solution into two parts.		
	(i) To the first part of the solution add dilute sodium		

	hydroxide solution dropwise until in excess.		
	(ii) To the second part of the solution add dilute ammonia solution dropwise until in excess		
(e)	Wash the residue in (c) above with water. Transfer a small portion of the residue to a clean dry test tube and heat it strongly until there is no further change.		
(f)	Dissolve the rest of the residue in dilute hydrochloric acid and divide the solution into two portions.		
	(i) To the portion of the solution add dilute sodium hydroxide solution dropwise until in excess.		
	(ii) To the second portion of the solution add dilute dropwise until in excess.		

(g) (i) The cations in ***J*** are***:***…….

(ii) The anion in ***J*** is: ……

END

CONFIDENTIALS

1. BA1 is 0.1M NaOH (100cm^3 for each)

   BA2 is 0.05M oxalic acid (100cm^3 for each)

   Phenolphthalein indicator.

   Pipettes burettes, Conical flasks, plastic beakers.

2. J is $CuCO_3$: $ZnCO_3$

   2 : 1

   - Heat source
   - Filter papers (for each candidate)
   - Spatulas, Filter funnels
   - 2M HCl, 2M NaOH, 2M NH_3(aq)
   - Test tubes atleast 4 of 5 for each candidate.
   - Water source
   - Blue and red litmus papers.