Name…….....Index No……

Stream……

545/3
Chemistry Practical
Paper 4
2 hours

KAMTEC EXAMINATIONS BOARD

UGANDA CERTIFICATE OF EDUCATION

CHEMISTRY PRACTICAL

PAPER 4

TIME: 2 HOURS

Instructions to Candidate

Attempt ALL questions in this paper.

Answers must be written in the spaces provided.

Where possible, use the following:

(C = 12, H = 1, O = 16)

For examiner's use only		
Q. 1		
Q. 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 one litre of solution.

   You are required to determine the value of n in the formula of the acid, $H_2(COO)_n$.

   (***BA1:BA2*** mole ratio is 2:1)

Procedure:

- Pipette 25.0cm^3 or 20.0cm^3 of BA1 into a conical flask, add 2 – 3 drops of phenolphthalein indicator.
- Titrate with BA2 from the burette.
- Repeat the titration until when you obtain consistent results.
- Record your results in the table below.

Results:

Volume of pipette used: ……cm^3 ($\frac{1}{2}$ mark)

Experiment	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of BA2 used (cm^3)			

(7 ½ marks)

Volume of BA2 used to calculate the average volume. (1 mark)

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Average volume of BA2 used. (2 ½ marks)

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Questions:

a) Calculate the;

(i) Number of moles of sodium hydroxide in BA1 used. (3 ½ marks)

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(ii) Molarity of BA2. (4 marks)

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b) Determine the value of n in $H_2(COO)_n$. (6 marks)

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2. You are provided with substance **W**, which contains one cation and two anions. You are required to carry out the following tests and identify the cation and anions in **W**. Identify any gas(es) that may be evolved.

(25 marks)

TESTS	**OBSERVATIONS**	**DEDUCTIONS**
a) Heat a spatula endful of **W** in a hard dry test tube, first gently and then strongly until there is no further change.		
b) Add 2 spatula endfuls of **W** in about $10cm^3$ of distilled water. Shake very well and then filter.		
Keep both the filtrate and residue. Divide the filtrate into four portions.		
(i) To the first portion in a test tube, add sodium hydroxide solution dropwise till in excess.		

TESTS	OBSERVATIONS	DEDUCTIONS
(ii) To the second portion, add ammonia solution drop-wise till in excess.		
(iii) To the third portion, add lead (II) nitrate solution.		
(iv) Use the fourth portion to carry out a test of your own choice to confirm the anion in the filtrate of W. Test : ……. ……. ……. ……. ……. …… …… ……		

TESTS	OBSERVATIONS	DEDUCTIONS
c) (i) Heat some of the residue in a test tube, first gently and then strongly until there is no further change.		
(ii) To a part of the remaining residue in a clean test tube, add dilute nitric acid.		

d) Identify the;

(i) Cation in W

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(ii) Anion in the filtrate.

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(iii) Anion in the residue.

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END