Candidates Name: …….....

Signature:..….....

Learner No.								

525/3
CHEMIST
RY
Paper 3
2024
2 hours

S.5 END OF TERM 1 EXAMINATIONS

Uganda Advanced Certificate of Education

CHEMISTRY

Paper 3
Practical

2 hours

INSTRUCTIONS TO CANDIDATES:

This paper consists of **one** examination *items. Answer* **all** *the items in the spaces provided.*

Drawings should be made in the spaces provided. Use **sharp pencils** *for your drawings. Coloured pencils or crayons should* **not** *be used.*

No additional sheets of writing paper are to be inserted in the booklet.

Work on additional sheets will **not** *be scored.*

 Turn Over

You are provided with the following:

FA_1 which is approximately 0.5M hydrochloric acid

FA_2 which is sodium hydroxide solution of unknown concentration

Solid M which is anhydrous sodium carbonate

Solid Q which is oxalic acid of formula **$H_2C_20_4.nH_2O$**

You are required to standardize **FA_1** using solid Q, and then standardize **FA_2** using **FA_1**, and then determine the number of moles of water of crystallization in solid Q

Procedure 1

Weigh accurately about **2.65g** of solid M in a beaker, add 100cm^3 of distilled water, shake to dissolve and transfer the resultant solution in a **250cm^3** volumetric flask. Top up to the mark with distilled water and label the solution FA_3.

Pipette **25cm^3/20cm^3** of FA_3 in a conical flask, add 2-3 drops of methyl orange indicator and titrate the resultant solution with FA_1 from the burette until the end point. Repeat the titration until you obtain consistent results.

Record your results in the table below:

(2 marks)

Volume of pipette used…….cm3

Mass of weighing container + M……g

Mass of empty container alone……g

Mass of M weighed…….g

(4½ marks)

Table 1

Experimental number	**1**	**2**	**3**
Final burette reading (cm3)			
Initial burette reading (cm3)			
Volume of FA1 used (cm3)			

(½ marks)

Titre values used to calculate average volume of FA1

……..…...cm3

(2½ marks)

Average volume of FA1

……

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…….cm3

Questions:

(2½ marks)

a) Calculate the molarity of FA_3 (Na = 23, C = 12, O = 16)

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b) Determine the concentration in Moldm^{-3} of FA_1

($4\frac{1}{2}$ marks)

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Procedure 2

Transfer 100cm^3 of FA_1 in a 250cm^3 volumetric flask. Top up to the mark with distilled water and label the resultant solution FA_4.

Pipette 25cm^3/20cm^3 of FA_2 in a conical flask, add 2-3 drops of phenolphthalein indicator and titrate the resultant solution with FA_4 from the burette until the end point. Repeat the titration until you obtain consistent results.

Record your results in the table below:

($0\frac{1}{2}$ marks)

Volume of pipette used……cm^3

Experimental number	**1**	**2**	**3**
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of FA_4 used (cm^3)			

(04½ marks)

Titre values used to calculate average volume of FA_4

(0½ marks)

……..…..cm^3

Average volume of FA_4

(02½ marks)

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…….cm^3

Questions:

c) Calculate the number of moles of hydrochloric acid in FA_4

(02 marks)

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d) Calculate the number of moles of hydrochloric acid that reacted with FA_2

(01 1/2 marks)

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e) Calculate the molarity of FA_2

(03 1/2 marks)

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Procedure 3

Weigh about 3.15g of solid Q in a beaker, add 100cm^3 of water, stir to dissolve and transfer the resultant solution in a 250cm^3 volumetric flask. Top up to the mark with distilled water and label the resultant solution FA_5.

Pipette 25cm^3/20cm^3 of FA_2 in a conical flask, add 2-3 drops of phenolphthalein indicator and titrate the resultant solution with FA_5 from the burette until the end point. Repeat the titration until you obtain consistent results.

Record your results in the table below:

(02 marks)

Volume of pipette used……cm3

Mass of weighing container + Q ……g

Mass of weighing container alone……...g

Mass of Q used……g

(04½ marks)

Experimental number	**1**	**2**	**3**
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of FA_5 used (cm^3)			

Titre values used to calculate average volume of FA_5

(0½ marks)

……..…...cm3

Average volume of FA_5

(02½ marks)

……

……

……cm3

Questions:

f) Calculate the number of moles FA_2 that reacted with FA_5

($01^1/_2$ marks)

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g) Calculate the number of moles per liter of the acid $H_2C_20_4.nH_2O$

($03^1/_2$ marks)

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h) Find the value of n in the acid (C =12, H = 1, O = 16)

(03 marks)

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END (The struggle has just begun don't relax at all please! yusufdb qt1102)