Candidate's Name: .....

School:.....

.....

Sign: .....

Centre No.					Personal No.		
U							

545/3
CHEMISTRY
PRACTICAL
Paper 3
JULY/AUG. 2023
2 hours

HOIMA DIOCESE EXAMINATIONS BOARD

UCE Mock Examination, 2023

CHEMISTRY

Paper 3

2 hours

INSTRUCTIONS TO CANDIDATES

Answer both questions. Answers are to be written in the spaces provided in this booklet.

You are not allowed to use reference books (i.e. text books, booklets on qualitative analysis etc.)

All working must be clearly shown.

Mathematical tables and silent non-programmable calculators may be used.

FOR EXAMINERS' USE ONLY			
Q. 1			
Q. 2			
TOTAL			

Turn Over

1. You are provided with;

BA1, which is a **0.2** M Hydrochloric acid.
BA2, which is a solution made by dissolving **5.0** g of a mixture of sodium salts of carbonate and nitrate (anhydrous sodium carbonate and sodium nitrate) to make **250** cm^3 of solution.

You are required to determine the
(i) mass of anhydrous sodium carbonate in the mixture.
(ii) percentage of sodium nitrate in the mixture.

Procedure
(a) Pipette 25.0 cm^3 (or 20.0 cm^3) of **BA2** into a clean conical flask.
(b) Add 2-3 drops of methyl orange indicator and titrate the solution with **BA1** from the burette up to the endpoint.
(c) Record your results in **Table 1** below.
(d) Repeat the procedure until you obtain consistent results.

Table 1
Volume of pipette used .....cm^3 *(0½ mark)*

Titration number	**1**	**2**	**3**
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of **BA1** used (cm^3)			

(07½ marks)

(a) (i) State the volumes of **BA1** used to calculate the average volume. *(0½ mark)*

.....

.....

.....

(ii) Calculate the average volume of **BA1** used. *(02½ marks)*

.....

.....

.....

.....

(b) Write the equation of reaction that took place. *(01½ marks)*

.....

.....,.....

.....

(c) Calculate the

(i) number of moles of **BA1** that reacted. *(03 marks)*

.....

.....

.....

.....

.....

.....

(ii) number of moles of **BA2** in 250 cm^3 of the solution. *(05 marks)*

.....

.....

.....

.....

.....

.....

.....

.....

.....

(d) Determine the

(i) mass of sodium carbonate in the mixture. *(02½ marks)*

.....

.....

.....

.....

.....

(ii) percentage of sodium nitrate in the mixture. *(02 marks)*

.....

.....

.....

.....

.....

.....

.....

2. You are provided with substance ***P***, which contains **two** cations and **one** anion. Carry out the following tests in **Table 2** below to identify the cations and anion in ***P***.
Identify any gas(es) that may be evolved.
Record your observations and deductions in the table. *(25 marks)*

Table 2

TESTS	OBSERVATIONS	DEDUCTIONS
(a) Comment on the nature of ***P***.		
(b) Add about 6 cm^3 of distilled water to a spatula end-ful of ***P*** in a boiling tube and boil. Filter while still hot and use the filtrate for part **(c)** below.		

(c) To the filtrate from (b) above, add dilute ammonia solution dropwise until in excess and filter. Keep both the filtrate and the residue.		
(d) Acidify the filtrate with dilute nitric acid and divide the acidified filtrate into **four** parts, test as follows: (i) To the **first** part, add dilute sodium hydroxide solution dropwise until in excess.		
(ii) To the **second** part, add dilute ammonia solution dropwise until in excess.		
(iii) To the **third** part, add 3 - 4 drops of Lead (II) nitrate solution.		

(iv) To the **fourth** part, add 2-3 drops of silver nitrate solution.		
(e) Wash the residue (c) and dissolve it in dilute nitric acid. Divide the resultant solution into **three** parts: (i) To the **first** part, add dilute sodium hydroxide solution dropwise until in excess.		
(ii) To the **second** part, add dilute ammonia solution dropwise until in excess.		
(iii) To the **third** part, carry out a test of your own choice to confirm one of the cations present in **P**. **Test**		

(f) The:

(i) cations in ***P*** are ..... and .....

(ii) anion in ***P*** is .....

END