Name: ..... Index No: .....

Signature: .....

543/3

Chemistry Practical

2 hours.

BUIKWE DISTRICT JOINT MOCK EXAMINATIONS BOARD (BUSSHA)
UCE EXAMINATIONS 2023

Chemistry Practical

Paper 3

2 hours

INSTRUCTIONS TO CANDIDATES

Answer **both** questions. Answers are to be written in the spaces provided in the booklet. All your work must be in **blue** or **black** ink.

Any work done in pencil will not be marked.

You are not allowed to use any reference books.

All working must be clearly shown.

Mathematical table and silent non-programmable scientific calculators may be used.

For Examiner's Use ONLY		
Q.1		
Q.2		
Total		

1. You are provided with the following :
   CA1, which is a solution containing **5.3g of an impure salt Z** in 1000cm³ of water

   CA2, which is **0.1M** hydrochloric acid.

   You are required to determine the percentage purity of Z.

Procedure:

Pipette **20** or **25cm³** of **CA1** into a clean conical flask. Add **2-3** drops of methyl orange indicator and titrate with solution **CA2** from the burette. Repeat the titration **2-3** time until you obtain consistent readings. Record your results in the table below.

Table of results:

Volume of pipette used.....cm³

	1	2	3
Final burette readings (cm³)			
Initial burette readings (cm³)			
Volume of CA2 used(cm³)			

(7½ marks)

Titre values of **CA2** used to calculate average volume (½mark)

.....

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Average volume: ..... cm³ (2½ marks)

Questions:

(a). Calculate the number of:

(i). moles of hydrochloric acid that reacted (3 marks)

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(ii). Moles of Z that reacted with the acid (2 marks)
(1mole of Z reacts with 1 mole of hydrochloric acid)

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(iii). moles of Z in 1000cm^3 of **CA1** that reacted (3 marks)

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(b). Determine the:

(i). mass of pure Z **(RFM of Z is 41)** (3 marks)

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(ii). Percentage purity of Z (3 marks)

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Chem P-3

2. You are provided with substance T, which contains **two** cations and **one** anions. Carryout the following tests on T to identify the cations and anion. Identify any gases evolved. Record your observations and deductions in the table below. (25 marks)

TESTS	OBSERVATIONS	DEDUCTIONS
(a). Heat **one** spatula endful of T in a dry test tube strongly until there is no further change.		
(b). Dissolve **two** spatula endfuls of T in about $5cm^3$ of water. Then add ammonia solution dropwise until in excess and filter. Keep both the **filtrate** and the **residue**.		
(c). To the filtrate from (b), add dilute nitric acid dropwise until the solution is just acidic. Divide the acidic solution into **five** portions.		

(i). To the **first** portion, add of sodium hydroxide solution dropwise until in excess.		
TESTS	**OBSERVATIONS**	**DEDUCTIONS**
(ii). To the **second** portion, add ammonia solution dropwise until in excess.		
(iii). To the **third** portion add 2-3 drops of lead (ii) nitrate solution followed by dilute nitric acid.		
(iv). To the **fourth** portion add 2-3 drops of silver nitrate solution.		
(v). To the **fifth** portion add 2-3 drops of barium nitrate solution followed by dilute nitric acid and warm.		
(c). Wash the residue with dilute ammonia solution and dry it. Dissolve it into a minimum amount of dilute nitric acid. Divide the resulting solution into **three** portions.		

(i). To the first portion, add of sodium hydroxide solution dropwise until in excess.		
(ii). To the second portion, add ammonia solution dropwise until in excess.		
TESTS	OBSERVATIONS	DEDUCTIONS
(iii). Use the third portion to carry out a test of your own to confirm one of the cations in T. Test;		

(e). (i). Cations in T: ..... and .....

(ii). Anion in T: .....

END