Name.....Center/Index number...../.....

545/4
CHEMISTRY
PRACTICAL
Paper 4
2023
2 hours

AITEL JOINT MOCK EXAMINATION

Uganda Certificate of Education

CHEMISTRY
PRACTICAL

Paper 4

2 hours

INSTRUCTIONS TO CANDIDATES:

- *Answer **all** questions.*
- *Answers are to be written in the spaces provided.*
- *You are **not allowed** to use any reference books.*
- *All working must be clearly shown.*
- *Mathematical tables, slide rules and non-programmable silent electronic calculators may be used.*

For Examiner's use only

Q1	Q2	TOTAL

1. You are provided with the following:
BA3, which is solution containing 3.8g of base $M(OH)_2$ in one litre.
BA4, which 0.1M hydrochloric acid.

You are required to determine the value of M in $M(OH)_2$
Procedure:
Pipette $25cm^3$ (or $20cm^3$) of BA3 into a clean conical flask. Add 2-3 drops of methyl orange indicator and titrate with solution BA4 from the burette until end point. Repeat the titration 2-3 times until you obtain consistent readings. Enter your results in the table below.
Results:
Table:
Volume of pipette used =…….cm^3

Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of BA4 used (cm^3)			

Titre values for calculating average violume of BA4_____cm^3.

∴ Average volume of BA4 used = ……cm^3

(a) Write the equation of reaction between $M(OH)_2$ and HCl

(b) Calculate the
(i) moles of hydrochloric acid in BA4 that reacted.

(ii) moles of $M(OH)_2$ in solution BA3 that reacted.

(iii) moles of $M(OH)_2$ in one litre of solution BA3

(iv) molar mass of $M(OH)_2$

(c) Determine the value of M in $M(OH)_2$
(H = 1 , 0 = 16)

2. You are provided with substance Z which contains <u>two</u> cations and <u>one</u> anion. You are required to identify the cations and anion in Z by carrying out the following tests on Z. Where gas(es) are evolved, it must be identified. Record your observations and deductions in the table below.

TESTS	OBSERVATIONS	DEDUCTIONS
(a) Heat two spatula endful of Z strongly until there is no further change. Keep the residue for part (c)		
(b) To one spatula endful of Z in a test tube add 3-4 drops of dilute nitric acid.		
(c) To the residue in (a), add dilute nitric acid drop-wise until there is no further change. Shake vigorously and then add dilute sodium hydroxide drop-wise until in		

excess. Filter and keep both the filtrate and the residue.		
(d) To the filtrate in (c) in a boiling tube, add dilute nitric acid drop-wise until the filtrate is <u>just acidic</u>. Divide the acidic filtrate into four parts. (i) To the first part of the acidified filtrate, add dilute sodium hydroxide drop-wise until in excess.		
(ii) To the second part of the acidified filtrate, add dilute ammonia solution drop-wise until in excess.		
(iii) To the third part of the acidified filtrate, add 3-4 drops of dilute sulphuric acid		
(iv) Use the fourth part to carry out a test of your own to confirm one of the cations in Z. Test:		
(e) Wash the residue and dissolve it in dilute hydrochloric acid. Divide the acidic solution into three parts. (i) To the first part of the acidic solution, add dilute sodium hydroxide drop-wise until in excess.		

(ii) To the second part of the acidic solution, add dilute ammonia solution drop-wise until in excess.		
(iii) To the third part of the acidic solution, add half a spatula endful of Magnesium powder, shake and allow to stand.		

(f) Identify the

(i) Cations in Z…….and……

(ii) anion in Z…….