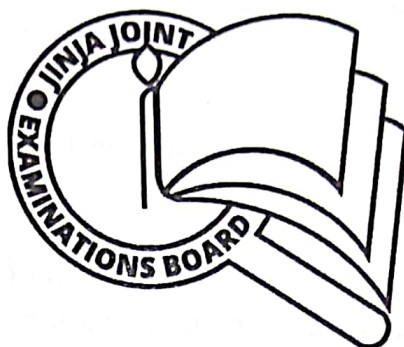


Name.....Center/Index Number...../.....

545/3
CHEMISTRY
PRACTICAL
Paper 3
AUGUST, 2022
2 hours



JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS – AUGUST, 2022

CHEMISTRY

PRACTICAL

Paper 3

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.
- $[H=1, O=16]$

For Examiner's use only

Q1	Q2	TOTAL

1. You are provided with the following:

BA1, which is a solution made by dissolving 1.0g of sodium hydroxide to make one 250 cm^3 of solution.

BA2, which is a solution made by dissolving 4.9g of an acid, H_nX per dm^3 of solution.

You are required to:

- determine the basicity of the acid, n in H_nX .
- Write equation for the reaction between the acid, H_nX and sodium hydroxide.

Procedure:

Pipette 20.0 or 25.0 cm^3 of BA1 into a clean conical flask.

Add 2-3 drops of phenolphthalein indicator and shake the mixture.

Titrate the contents in the flask with BA2 from the burette. Record your results in the table below.

Repeat the procedure until you obtain consistent results.

Table of results:

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 BA2 used (cm^3)			

(7½ marks)

State the volumes of BA2 used to calculate the average volume.

(0 ½ mark)

Average volume of BA2 used.

(2 ½ marks)

cm^3

Questions:

(a) Calculate the number of moles of:

(i) Sodium hydroxide in BA1 that reacted. (Na=23; O=16; H=1) (5 marks)

(c) Write the equation for the reaction between the solid H_2X and sodium hydroxide

m N 11

(ii) Acid, H_nX in BA2 that reacted

(3 ½ marks)

(Formula mass of $H_nX = 98$)

- (b) Determine the reaction ratio between the acid, H_nX and the sodium hydroxide. Hence the value of n in the acid, H_nX . (4 marks)

- (c) Write the equation for the reaction between the acid, H_nX and sodium hydroxide.

(1 ½ marks)

2. You are provided with substance **Q** which contains **two cations** and a **common anion**.

Carry out the following tests to identify the cation and anions in **Q**.

Identify any gas(es) that may be involved. Record your observations and deductions in the table below.

(25 marks)

TESTS	OBSERVATIONS	DEDUCTIONS
(a) Heat two spatula end-fuls of Q , gently and then strongly		
(b) To two spatula end-fuls of Q , in a boiling tube, add dilute nitric acid dropwise until there is no further change.		
(c) To the resultant mixture from (b), add dilute sodium hydroxide solution dropwise until in excess. Shake and filter the mixture. Keep both residue and filtrate.		
(d) To the filtrate, add dilute nitric acid dropwise until the		

filtrate if just acidic. Divide the acidified filtrate into four parts.		
(i) To the first part of the acidified filtrate, add dilute sodium hydroxide solution drop-wise until in excess.	OBSERVATIONS	TESTS
(ii) To the second part of the acidified filtrate, add dilute ammonia solution drop-wise until in excess.		(a) Heat two spatula end-tubs of Q gently and then strongly
(iii) To the third portion of the acidified filtrate, add 3 – 4 drops of dilute sulphuric acid		(b) To two spatula end-tubs of Q in a boiling tube, add dilute nitric acid dropwise until there is no further change.
(iv) Use the forth part of the acidified filtrate to carry out a test of your own choice in order to confirm the one of the cations in Q		(c) To the resultant mixture from (b), add dilute sodium hydroxide solution dropwise until in excess. Shake and filter the mixture. Keep both residue and filtrate. (d) To the filtrate, add dilute nitric acid dropwise until the

(e) Wash the residue with distilled water and then dissolve it in dilute nitric acid.

Divide the acidic solution into three parts.

(i) To the first part of the acidic solution, add dilute sodium hydroxide solution dropwise until in excess.

(ii) To the second part of the acidic solution, add 3-4 drops of dilute sulphuric acid.

(iii) To the third part of the acidic solution, add dilute ammonia solution dropwise until in excess.

(f) (i) The cations in **Q** are _____

(ii) The anion in **Q** is _____