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, 0=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:

(i) determine the basicity of the acid, n in H_nX.

(ii) 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)

(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 exces. 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.		
(ii) To the **second** part of the acidified filtrate, add dilute ammonia solution drop-wise until in excess.		
(iii) To the **third** portion of the acidified filtrate, add 3 – 4 drops of dilute sulphuric acid		
(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		

(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 sulphiric acid.		
(iii) To the **third** part of the acidic solution, add dilute ammonia solution drop wise until in excess.		

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

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

End