Name:.....

Signature..... Centre /Index No.....

545/3
Chemistry
Paper 3
July/August,2022
2 Hours.

TESO SECONDARY SCHOOLS MOCK EXAMINATION ASSOCIATION(TESSMEA)

Uganda Certificate of Education 2022

CHEMISTRY PRACTICAL)

Paper 3

2 Hours.

Instructions to candidates

Answer both questions. Answers are to be written in the spaces provided in this booklet
All your working 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 (i.e text books, booklets on qualitative analysis etc).
All working must be clearly shown.

For Examiner's use only		
Q.1		
Q.2		
Total		

Q1. You are provided with the following

BA1, which is a solution made by dissolving 1g of sodium hydroxide in $250cm^3$ of water.

BA2, which is a solution containing 6.3g dm^{-3} of an acid H_2A .x H_2O.

You are required to determine the value of X in the acid

Procedure:

Pipette $25cm^3$ (or $20cm^3$) of BA2 into a conical flask. Add 2-3 drops of phenolphthalein indicator and titrate with BA1 from the burette.

Repeat the titration until you obtain consistent results

Record your results in the table below

Volume of pipette used..... cm^3 *(½ mark)*

Final burette reading (cm^3)			
Initial burette reading(cm^3)			
Volume of **BA1** used (cm^3)			

(7 ½ marks)

Titre values of **BA1** used for average volume. *(01mark)*

..... cm^3

Average volume of **BA1** used. *(2 ½ marks)*

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Questions

(a). Calculate

(i). The molarity of **BA1** [Na = 23, H = 1, O = 16]. *(03marks)*

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(ii). The number of moles of **BA1** that reacted with **BA2**. *(1 ½ marks)*

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(iii). The number of moles of **BA2** that reacted with **BA1**. *(03marks)*

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(iv). The number of moles of the acid $H_2A.x\ H_2O$ in $1.0dm^3$ of **BA2**

(1 ½ marks)

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(b). Determine the relative formula mass of the acid $H_2A.xH_2O$, hence the value of X. [H = 1, A = 88, O = 16]. *(4 ½ marks)*

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Q2. You are provided with substance T, which contains two cations and two anions. You are required to carry out the following tests on T and identify the cations and anions in T. Identify any gas(es) evolved and record your observations and deductions in the spaces provided. *(25marks)*

Tests	Observations	Deductions
a). Heat a spatula endful of T strongly in a dry test tube		
b). To two spatula endfuls of T in a test tube add dilute nitric acid drop-wise until there is no further change, followed by dilute sodium hydroxide solution drop-wise until in excess. Filter and keep both the filtrate and the residue.		
c). To the filtrate add dilute nitric acid drop-wise until the solution is just acidic. Divide the solution into four parts. (i). To the first part of the acidic solution add dilute sodium hydroxide solution 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 sodium sulphate solution.		
(iv). Use the fourth part of the acidic solution to carryout a test of your own choice to confirm the cation in the filtrate.		

d). Wash the residue and dissolve it in dilute nitric acid. Divide the solution into two parts		
(i). To the first part add dilute sodium hydroxide solution drop-wise until in excess		
(ii). To the second part of the solution add dilute ammonia solution drop-wise until in excess		

e). Identify the;

(i) Cation in T .....and.....

(ii). Anions in T.....and.....

END

545/3

CHEMISTRY

PRACTICAL

3 Hours

TESO SECONDARY SCHOOLS MOCK EXAMINATION ASSOCIATION (TESSMEA)

Uganda Certificate of Education 2022

CHEMISTRY PRACTICAL

Paper 3

CONFIDENTIAL

Great care should be taken that the information given below does not reach the candidates either directly or indirectly.

NB: The Headteacher must ensure that the teacher responsible for preparing the apparatus hands in his/her trial results properly sealed in a separate envelope and firmly fastened to the candidate's scripts envelope.

1 The description of the reagents and chemicals specified below does not necessarily correspond with the description in the question paper. Candidates must NOT be informed of the difference.
2 Candidates are not allowed to use reference books (i.e text books) booklets of qualitative analysis etc) during examination.
3 In addition to fittings and substances ordinarily contained in a chemistry laboratory , each candidate will require:
1 burette ($50cm^3$)
1 pipette ($25.0cm^3$ or $20.0cm^3$)
1 conical flask
1 measuring cylinder ($50cm^3$)
6 test tubes

1 filter paper
1 filter funnel
2 beakers (250ml)
100cm^3 of distilled water
100cm^3 of BA1
100cm^3 of BA2
2 g of H
Easy access to:

- Heat source
- Common reagents for identifying gases, cations, and anions
- Phenolphthalein and methyl orange indication

BA1 is prepared by dissolving 4.0g of sodium hydroxide in distilled water to make one litre of solution.

BA2 is prepared by diluting 8.6cm^3 of concentrated hydrochloric acid ((36%, 1.18g cm^3) with distilled water to make one litre of solution

H – mixture of magnesium carbonate and lead(II) nitrate in a ratio of 2 : 1

END