**NAME:………………………………………………………INDEX NO:……………………**

**SCHOOL:…………………………………………………..DATE: ......................................**

 **SIGN:…………………**

**233/3**

**CHEMISTRY (Practical)**

**Paper 3**

**Time: 2 ¼ Hours**

**ELERAI PRE- MOCK EXAMINATIONS - 2016**

***Kenya Certificate of Secondary Education (K.C.S.E)***

***CHEMISTRY PAPER 2 (PRACTICAL)***

***2 ¼ HRS***

**Instructions to Candidates**

1. *Write your name and index number in the spaces provided in the question paper.*
2. *Sign and write the date of the examination in the spaces provided above.*
3. *Answer* **ALL QUESTIONS** *in the spaces provided on the question paper.*
4. *You are NOT allowed to start working with the apparatus for the first 15 minutes of the 2 ¼ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.*
5. *All working* **MUST** *be clearly shown where necessary.*
6. *Mathematical tables and electronic calculators may be used*

**For Examiner’s Use Only**

|  |  |  |
| --- | --- | --- |
| **Question**  | **Maximum Score**  | **Students Score** |
| 1  | **21** |  |
| 2 | **13** |  |
| 3 | **06** |  |
| Total score | **40** |  |

***This paper consists of 8 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing***

**PRACTICAL** (**21marks)**

1. You are provide with;

Sodium hydroxide solution L

1.0g of an ammonium salt, solid M

0.1M monobasic acid, solution N.

You are required to:

Dilute solution L with distilled water,

Standardize the diluted solution L with solution N,

Determine the relative formula mass of the ammonium salt M.

**Procedure 1:**

Pipette 25cm3 of solution L into a 250CM3 beaker, measure 175cm3 of distilled water using a 100cm3 measuring cylinder and add it to solution L in the beaker. Shake well. Label this as solution R. Pipette 25cm3 of solution R into a 250cm3 conical flask and then titrate with solution N using 1 to 2 drops of phenolphthalein indicator. Record your results in Table 1 below. Repeat this procedure to obtain accurate values.

**Table I**

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| Final burette reading (cm3) |  |  |  |
| Initial burette reading (cm3) |  |  |  |
| Volume of N used (cm3) |  |  |  |

(4marks)

(a) Determine the average volume of solution N used. (1mark)

(b) Calculate the concentration, in moles per litre, of the sodium hydroxide in solution R. (1marks)

(c) Calculate the concentration, in moles per litre, of the sodium hydroxide in solution L. (1marks)

*In the process described below, sodium hydroxide reacts with the ammonium salt N and on boiling the mixture, ammonia gas is expelled. The excess sodium hydroxide is then determined by titrating with the monobasic acid, solution N.*

**Procedure II:**

Place all the 1.0g of the ammonium salt M into a 250cm3 conical flask. Pipette 25cm3 of the sodium hydroxide solution L into the conical flask containg solid M. shake well until all the solid dissolves. Heat the mixture and let it boil for about 10 minutes. Add 50cm3 of distilled water to the boiled mixture and shake well. Transfer the solution into 100cm3 measuring cylinder then add distilled water up to 100cm3 mark. Pour this solution back into the conical flask and label it as solution f.

Pipette 25cm3 of solution F into a 250cm3 conical flask and titrate with solution N using 1 to 2 drops phenolphthalein indicator. Record your results in Table II below. Repeat this procedure to obtain accurate values and complete Table II.

**Table II**

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| Final burette reading (cm3) |  |  |  |
| Initial burette reading (cm3) |  |  |  |
| Volume of N used (cm3) |  |  |  |

 (4marks)

**Calculations**

(d) Determine the average volume of N used. (1mark)

(e) Calculate:

(i) The number of moles of the monobasic acid, solution B, used. (1marks)

ii) Moles of NaOH in 25cm3 of solution F

ii) Moles of NaOH in 100cm3 of solution F

f) Moles of NaOH in 25cm3 of solution L

g) Moles of the NaOH that did not react with the Ammonium salt

h) No of moles of Ammonium salt given the reaction is 1:1

i) Determine the RFM of the Ammonium salt

1. You are provided with substance P. Carry out the tests below and write your observations and inferences in the spaces provided.

(a) Describe the appearance of substance P. (1mark)

(b) Place about one-third of substance P in a dry test-tube and heat it strongly.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark) (1 mar** | **(1mark)** |

(c) Please the remaining amount of substance P in a boiling tube. add about 10cm3 of distilled water and shake well. Retain the mixture for tests in (d) below.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark) (1 mark)** |  **(1mark)** |

(d) Use about 2cm3 portions of the mixture obtained in (c)for tests (i) to (iii) below.

(i) Add two to three drops of aqueous barium nitrate to the mixture.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |

(ii) Add five drops of dilute nitric (V) acid to the mixture

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |

(iii) Add to the mixture, aqueous sodium hydroxide dropwise until in excess.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |

(e) Give the formula of the cation and anion present in substance P.

Cation ……………………………………………………………………( ½ mark)

Anion…………………………………………………………………… ( ½ mark)

1. You are provided with an organic substance Q. Carry out the following tests and record your observations and inferences in the spaces provided.

(a) Place about one-third of substance Q on a metallic spatula an ignite it with a Bunsen burner flame.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |

(b) Place the remaining amount of substance Q in a boiling tube and add about 10cm3 of distilled water. Heat the mixture and allow it to boil for about 30seconda. Divide the mixture while still hot into two portions.

 (i) To the first portion, add solid sodium hydrogen carbonate provided.

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |

 (ii) To the second portion, add two or three drops of acidified potassium manganate (VII)

|  |  |
| --- | --- |
| **OBSERVATIONS**  |  **INFERENCES** |
|  **(1 mark)** |  **(1mark)** |