**NAME …………………………..……………….. DATE …………………………**

**INDEX NO. ……….……….…………………...…..… SIGNATURE ……………..…………..**

**233/3**

**CHEMISTRY**

**PRACTICAL**

**PAPER 3**

**TIME: 2**¼ **HOURS.**

**SET 5**

*Kenya Certificate of Secondary Education.*

**INSTRUCTIONS TO CANDIDATES.**

* Write your name and index number in the spaces provided above.
* Answer **ALL** the questions in the spaces provided.
* You are not allowed to start working with the apparatus for the first 15 minutes of the 2¼ hours allowed time for the paper.
* Use the 15 minutes to read through the question paper and note the chemicals you require
* Mathematical tables and electronic calculators may be used.
* All working **MUST** be clearly shown where necessary.

**FOR EXAMINER’S USE ONLY.**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate’s score** |
| 1 | 18 |  |
| 2 | 16 |  |
| 3 | 06 |  |
| **Total score** | 40 |  |

***This paper consists of 7 printed pages.***

***Candidates should check to ensure that all pages are printed as indicated and no questions are missing***

1. Your are provided with
* Solution A which is 0.1M of acid HxR
* Solution B which is prepared by dissolving 11.2g of potassium hydroxide in a litre.

 You are required to determine the basicity of the acid HxR, solution A.

 **Procedure**

* Fill the burette with solution A
* Pipette 25.0cm3of solution B and transfer into a chemical flask. Add 2 drops of phenolphthalein indicator and shake.
* Titrate solution B with solution A from the burette until the pink colour turns colourless
* Record your results in the table below.

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

 (5marks)

1. Calculate the average volume of solution A used. (1mark)

 ……………………………………………………………………………………………………………………………………………………………………

1. Calculate the concentration so solution B in mol dm-3 (K = 39, O = 16, H =1) (3marks)

 ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Determine the number of moles of solution B (Potassium hydroxide) that reacted. (3marks)

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1. Calculate the number of moles of the acid (solution A) that reacted. (3marks)

 …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..…………………

1. Calculate the basicity of the acid. (3marks)

 ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. You are provided with solid Q. Carry out the tests below and record the observations and inferences in the spaces provided.
2. 1. Place all the solid Q in a boiling tube and add about 10cm3 of distilled water and shake thoroughly.

 Filter and keep the residue for part (b) below. Divide the filtrate into 3 portions.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the 1st portion, add sodium hydroxide solution dropwise till in excess.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the 2nd portion, add a few drops of ammonia solution till in excess.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the third portion, add a few drops of acidified barium nitrate solution.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

1. 1. Place all the residue into a clean boiling tube. Add about 5cm3 of dilute Nitic (V) acid and shake well. Divide the solution into three portions.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the 1st portion, add afew drops of sodium hydroxide solution till in excess.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the 2nd portion add a few drops of ammonia solution till in excess.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

* 1. To the 3rd portion, add a few drops of dilute sulphuric (vi) acid and shake well.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

1. You are provided with liquid F. Carry out the following tests and record the observations and inferences in the table below.
2. Dip a strip of paper into the liquid F and burn using non- luminous flame.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

1. Put about 1cm3 of the liquid F in a test – tube and add 2-3 drops of acidified potassium manganate (vii) and shake.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |

1. Put about 1cm3 of the liquid F in a test tube and add 2-3 drops of acidified potassium dichromate (vi) and shake.

|  |  |
| --- | --- |
| Observations |  Inferences  |
| 1mk | 1mk |