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

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

**233/3**

**CHEMISTRY**

**PRACTICAL**

**PAPER 3**

**TIME: 2**¼ **HOURS.**

**GOLDEN ELITE EXAMINTIONS 2020**

*Kenya Certificate of Secondary Education*

**233/3**

**CHEMISTRY**

**PAPER 3**

**PRACTICAL**

**TIME: 2**¼ **HOURS.**

**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 | 17 |  |
| 2 | 8 |  |
| 3 | 15 |  |
| **Total score** | 40 |  |

***This paper consists of 6 printed pages.***

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

1. Solution A is prepared by dissolving 6.3g of the organic acid H2­C2O4.nH2O in water to make a litre of the solution.

Solution B: 0.1M NaOH solution

Phenolphthalein indicator

Clamp and stand

Burette and pipette.

You are required to determine the value of n in the organic acid H­2C2O4. nH2O

**Procedure.**

Fill the burette with solution A and adjust the volume to zero mark.

Add 2 to 3 drops of phenolphthalein indicator and titrate solution A against solution B until thecolour just permanently changes. Record your results in the table below. Repeat the procedure two more times to obtain concordant results.

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

**4marks**

1. Calculate the average volume of solution A used. **1mark**
2. Calculate the moles of sodium hydroxide in the volume of solution B used. **2marks**
3. Given that solution B - Sodium hydroxide and solution A organic acid react in the ration of 2:1, calculate the number of moles of the organic acid –solution A used? **2marks**
4. Calculate the moles of organic acid solution A used per litre of solution **2marks**
5. Calculate the relative formula masses of the organic acid solution A **3marks**
6. Calculate the value of n in H2C2O4.nH2O(H=1, C=12, O=16) **3marks**
7. You are provided with CBI. Carry out the test below. Write your observation and inferences in the spaces provided.
8. Using a clean spatula, heat about one third of the solid CBI in a non- luminous Bunsen burner flame.

Observation Inferences

 **1mark** **1mark**

1. Put a half spatula endful of CBI in a test tube. Heat gently and then strongly. Test for any gas produced using litmus papers.

Observation Inferences

 **1mark** **1mark**

1. Put 2cm3 of dilute hydrochloric acid into a test tube. Add ¼ endful of CBI into the test tube.

Test for any gas procedure.

Observation Inferences

 **2marks** **2marks**

1. You are provided with solid Q, carry out the test below. Record your observations and inferences in the table. Identify any gas (es) evolved.

Place all the solid Q provided into boiling tube and add distilled water until the tube is ¼ full. Divide it into five portions.

1. To the 1st portion add ammonia solution drop wise until excess.

Observation Inferences

**1mark** **1mark**

1. (i) To the 2nd portion add sodium hydroxide solution dropwise until in excess. Keep the resulting

mixture for the next test.

Observation Inferences

 **1mark** **1mark**

ii) Warm the preserved mixture from b (i) above

Observation Inferences

 **1mark** **1mark**

1. i) To the 3rd portion add silver nitrate solution. Preserve the mixture for the next test.

Observation Inferences

 **1mark** **1mark**

ii) To the preserved mixture in c (i) above add diluted nitric acid.

Observation Inferences

 **1mark** **1mark**

1. To the 4th portion add dilute Barium nitrate solution followed by dilute nitric acid.

 Observation Inferences

 **1mark** **1mark**

1. To the 5th portion add 2-3 drops of conc. Nitric acid.

Warm the mixture and allow to cool. Add sodium hydroxide solution dropwise until in excess.

Observation Inferences

**1mark** **1mark**