**Name ..................................................................................................... Admission . ....................................................**

**Candidate's signature .............................................................. Date .........................................................**

**233/3**

**CHEMISTRY**

**Paper 3**

**PRACTICAL**

**Time 2¼ hours**

**LANJET CLUSTER JOINT EXAMINATION - 2018**

**CHEMISTRY PRACTICAL**

**JULY/AUGUST 2018**

**Paper - 233/3**

**Time: 2¼ hours**

**INSTRUCTIONS TO CANDIDATES**

* Answer all question in the space provided in the question paper.
* You are not allowed to start working with apparatus for the first 15minutes 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 chemicals and apparatus that you may need.
* All working **MUST** be cleary shown where necessary.
* Candidate should check the question paper to ensure that all the pages are printed as indicated and that no question is missing.
* Candidate should answer questions in English.

**FOR EXAMINER'S USE ONLY**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum marks** | **Candidate's score** |
| 1 | 11 |  |
| 2 | 13 |  |
| 3 | 16 |  |
| **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 pages are missing.***

**Q1.** You are provided with:

Solution A: Hydrochloric acid

Solution B: 0.05 M sodium carbonate

Phenolphthalein indicator

Methyl orange indicator

You are required to standardize solution A using solution B.

**Procedure:**

Fill burette with solution A. pipette 25ml of solution B into the conical flask. Add 3 drops of phenolphthalein indicator and titrate with solution B. Do not pour the content of the conical flask. Record the reading in the **table I** below. Add 3 drops of methyl orange indicator to the content of the conical flask and continue titrating with solution A. Record the readings in **table II** below. Repeat the procedure and complete table I and table II.

Table I (using phenolphthalein indicator) (3mks)

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| Find burette reading |  |  |  |
| Initial burette readings |  |  |  |
| Volume of solution A cm3 |  |  |  |

1. Find average **titre** t1 (1mk)

Table II (Using methyl orange indicator)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Find burette reading |  |  |  |
| Initial burette readings |  |  |  |
| Volume of solution A cm3 |  |  |  |

Find average **titre** t2 (1mk)

1. Find the total volume of solution A used. (1mk)
2. Calculate the number of moles of sodium carbonate in 25cm3  (1mk)
3. Write the equation for the reaction between solution A and solution B. (1mk)
4. Find the moles of solution A in the total volume of the acid. (1mk)
5. Find the morality of the acid. (2mks)

**Q2.** You are provided with:

1M sodium hydroxide solution C

1M sulphuric (vi) acid solution D

You are required to determine heat of neutralization of sodium hydroxide solution. Using a measuring cylinder, measure 50cm3 of solution C and transfer it to 100ml lagged beaker. Record the initial temperature of solution C in the **Table I below.** Clean the measuring cylinder and use it to measure 5cm3 portion of solution D to the solution C in a beaker stir with thermometer and record the new temperature in the table below. Continue adding 5cm3 portion of solution D recording the temperature after each addition until 40cm3 of solution D has been added.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Solution of D added cm3 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| Temperature of mixture (oc) |  |  |  |  |  |  |  |  |  |

(5mks)

1. Plot the graph of temperature rise against volume of the solution D Used. (3mks)
2. From the graph determine the maximum temperature rise. (1mk)
3. From the graph determine the volume of solution D required for neutralization. Indicate V of the graph. (1mk)
4. Calculate the molar heat of neutralization for the reaction ( C = 4.2J/kg/K. Na = 23 H = 1 S =32 O =16) (3mks)

**Q3. A** You are provided with:

**SOLID E**

* Sodium hydroxide solution
* Potassium iodide solution
* Wooden split

Solid E is suspected to be lead(ii) Nitrate

1. From reagents provided, select and describe 3 tests that could be carried out consecutively to confirm solid E is lead (ii) Nitrate. Write the tests and expected observation in the space provided.

|  |  |
| --- | --- |
| Test 1 | Expected observation |
| (1mk) | (1mk) |

|  |  |
| --- | --- |
| Test 2 | Expected observation |
| (1mk) | (1mk) |

|  |  |
| --- | --- |
| Test 3 | Expected observation |
| (1mk) | (1mk) |

1. Carry out tests described in (a) using solid E and record observations and inference in space provided.

**Test 1**

|  |  |
| --- | --- |
| Observation | Inference |
| (½mk) | (½mk) |

**Test 2**

|  |  |
| --- | --- |
| Observation | Inference |
| (1½mk) | (½mk) |

**Test 3**

|  |  |
| --- | --- |
| Observation | Inference |
| (½mk) | (½mk) |

**Q3B.** You are provided with solid F carry out the following tests. Record observations and inferences in the space provided.

1. Place all solid F in a boiling tube.

Add about 10cm3 of distilled water and shake. Retain the solution for use in procedure (b).

|  |  |
| --- | --- |
| Observation | Inference |
| (½mk) | (½mk) |

1. Use about 3cm3 portion of the mixture in a test tube for the test (i) (ii) and (iii).
2. To the first portion of the mixture put universal indicator paper provided.

|  |  |
| --- | --- |
| Observation | Inference |
| (½mk) | (½mk) |

1. To the second portion add two drops of acidified potassium manganate VII and warm the mixture**.**

|  |  |
| --- | --- |
| Observation | Inference |
| (1mk) | (1mk) |

1. To the last portion add 3 drops of bromine water.

|  |  |
| --- | --- |
| Observation | Inference |
| (½mk) | (½mk) |