CANDIDATE NAME: _____SCHOOL _____

CENTRAL EAST EDUCATION DIVISION

2024 MALAWI SCHOOL CERTIFICATE MOCK EXAMINATION

CHEMISTRY

Wednesday, 13 March

Subject number: M038/II
Time Allowed: 2 hours session

PAPER
(40 Marks)

Practical

Instructions

1. **This paper contains 6 printed pages. please check**
2. Fill in your **name** at the top of each page.
3. This paper contains two sections, **A** and **B**. In section **A** there are **2** descriptive questions on practical work to be answered in **1 hour**. In section **B** there are **2** practical questions to be answered in **1 hour**
4. Use of electronic calculators is allowed.
5. The maximum number of marks is indicated for each question.
6. In the table provided on this page **tick** against the number of the question you have answered.
7. Hand in your question paper to the invigilator when time is called to stop writing.

Question Number	Tick if answered	Do not write in these columns	
1			
2			
3			
4			
Total			

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Section A: Descriptive Questions

1. Describe an experiment that could be carried out to prepare nitric acid in the laboratory.

(10marks)

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2. The electrolysis of dilute sulphuric acid (H_2SO_4) is essentially the electrolysis of water. With the aid of a clearly labelled diagram, show that this statement is true. Support your answer by giving relevant ionic equations and explanations for the reaction that take place at the anode and cathode during the electrolysis of dilute sulphuric acid.

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(10 mark)

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Section B: Practical Questions

Liquid in test tube	Initial temperature	Substance added	Final temperature	Temperature change
Water		Sodium hydroxide		
Water		Ammonium nitrate		

You are provided with 1 test tube in a rack, a thermometer, distilled water in a container, measuring cylinder, spatula, ammonium nitrate, crystals, sodium hydroxide pellets.

Procedure

a. Measure 5ml of water using measuring cylinder and transfer it into a test tube
b. Measure the temperature of water in a test tube and record in the table of results

Table of results

(5 marks)

c. Add $^{1}/_{4}$ spatula of sodium hydroxide pellets and stir or shake gently
d. Measure the temperature of the solution and record in the table of results
e. Calculate the temperature change
f. Rinse the test tube with distilled water until it is clean
g. Repeat steps **a** to **e** for ammonium nitrate
h. Which of the above activity is

Exothermic?_____

(1 mark)

Endothermic?_____

(1 mark)

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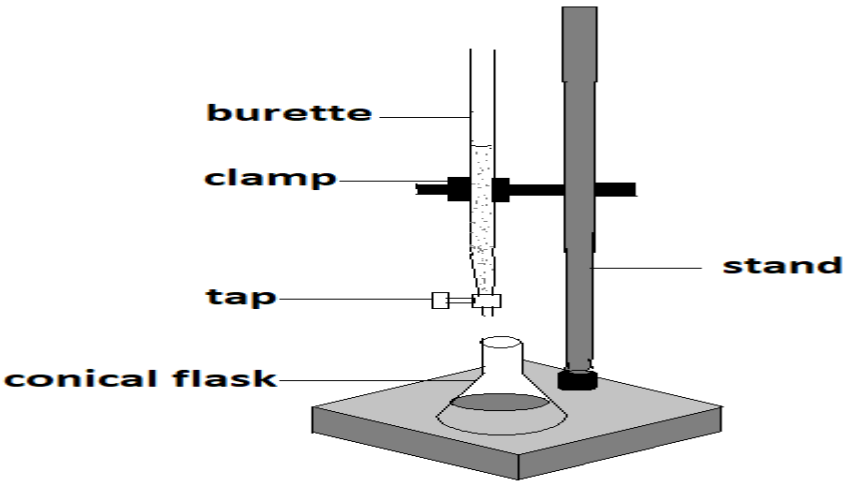
i. Draw an energy level diagram for the dissolving of ammonium nitrate (3 marks)

3. You are provided with the following: burette, clamp stand, conical flask, measuring cylinder, phenolpthalein indicator, white tile (white paper) 25ml of 0.1M sodium hydroxide (NaOH) solution, sulphuric acid (H_2SO_4) of unknown concentration, a funnel.

Procedure

a. Set up the apparatus as shown below



b. Fill the burrete with sulphuric acid to the O ml mark through a funnel.

c. Record the reading in the table of results

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d. Measure 10ml of sodium hydroxide using a measuring cylinder and transfer it into a conical flask
e. Add three drops of phenolpthalein indicator into conical flask
f. Add sulphuric acid gradually drop by drop from the burette by opening the tap while shaking the conical flask
g. Stop adding sulphuric acid when the colour change is observed
h. Repeat the experiment for the second trial.

Table of results

		First trial	**Second trial**
Initial volume (cm^3)		I	
Final volume (cm^3)			
Volume used (cm^3)			

(4 marks)

i. Determine the concentration of sulphuric acid by factoring in the average volume of the acid used. **(6 marks)**

END OF QUESTION PAPER

NB: This paper contains 6 pages.