NAME: _____ FORM _____

ST. MARY'S SECONDARY SCHOOL

2019-2020 MOCK EXAMINATIONS

CHEMISTRY

Subject Number: M036/II

Time allowed: 2 hour sessions

2:00 pm onwards

Date: 22nd September, 2020.

PAPER II

(40 marks)

PRACTICAL

Instructions:

1. **This paper contains 6 printed pages. Please check.**
2. Before beginning, write your **Full Name** at the top of each page of the question paper.
3. Write your answers on the question paper.
4. This paper contains **two** sections, **A** and **B.**
5. Section **A** consists of two descriptive questions on practical work to be answered in 1 hour. Marks will be given for accurate and orderly presentation of facts supported by relevant diagrams.
6. In section **B** there are **two** practical questions to be answered in **1 hour.**
7. Marks for section **B** will be given for observation, accuracy and interpretation of results.
8. You should spend **30 minutes** on each question. The 30 minute period allowed for each question includes **3 minutes** to tidy up the apparatus and have it checked by the supervisor.
9. In the table provided on this page, **tick** against the question number you have answered.

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

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Section A (20 marks)

Answer **all** questions from this section

Question 1

Describe the method you can follow in an experiment can be carried out to determine the percentage of water in a hydrated ionic compound such as sodium carbonate decahydrate ($Na_2CO_3. 10H_20$).

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Question 2 (10 marks)

A form 4 student at St. Mary's Secondary School found a piece of impure copper metal. With the aid of a well labelled diagram, describe an experiment she can conduct to obtain pure copper metal. Your description should also include the half equations at the anode and cathode.

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Question 3 (10 marks)

1. You are provided with 3 test tubes, measuring cylinder, distilled water, a test tube rack, copper sulphate solution, aluminium sulphate solution, iron sulphate solution, copper foil, aluminium foil and iron nails.
   a. Pour 50 cm^3 of copper sulphate solution in each of the 3 test tubes.
   b. Place a piece of copper foil, aluminium foil and an iron nail in each test tube.
   c. Observe and record the results by indicating "reaction" in the appropriate spaces in the table below
   d. Rinse the test tubes using distilled water.
   e. Repeat steps (a) to (d) using aluminium sulphate and ion sulphate solutions.

Table of results

metal	**Copper sulphate solution**	**Aluminum sulphate solution**	**Iron sulphate solution**
Copper			
Aluminium			
Iron			

f. Arrange the metals in order of their reactivity, with the most reactive metal at the top.

_____

_____

_____

g. Which of the metals is the strongest reducing agent?

_____

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Question 4 (10 marks)

You are provided with five 100cm^3 conical flasks or100cm^3 glass beakers, filter paper or white tile, stop watch or stop clock, 0.5M sodium thiosulphate (NaS2O3) solution, 2M hydrochloric acid (HCI) solution, pental marker or black ink, distilled water, and measuring cylinder.

a. Place the five conical flasks/beakers on a bench
b. Put 10cm^3 of HCL solution into each of the 100cm^3 conical flasks/ beakers labelled A, B, C D and E.
c. Add 5cm^3 of NaS_2O_3 and distilled water to 10cm^3 of HCl solution placed in flask A. Immediately start the stop watch or stop clock and swirl (shake gently) the contents of the flask. Note and record the time it takes for he cross (X) to be obscured (when you cannot see it anymore).
d. Repeat the steps (c) to (e) using the solutions of Na_2S_2O3 and distilled water in conical flasks/ beakers B, C, D and E respectively as indicated in the table below.

Conical flask/beaker	**Volume of $Na_2S_2SO_3$ added to distilled water (cm^3)**	**Volume of distilled water used (cm^3)**	**Volume of HCl used (cm3)**	**Time taken for the cross to disappear (s)**	**l/time (s-1)**
A	5	20	10		
B	10	15	10		
C	15	10	10		
D	20	5	10		
E	25	0	10		

e. Calculate the reaction rate in each beaker. This can be done using the following equation: Reaction rate = $\frac{1}{Time}$. Fill in the last column.
f. Write a balanced chemical equation for eh reaction between sodium thiosulphate ($Na_2S_2O_3$) solution and hydrochloric acid (HCl) solution.
g. Plot a graph of reaction rate (on the y-axis) against volume of $Na_2S_2O_3$ solution (On the x-axis).
h. Describe the relationship between concentration and reaction rate.

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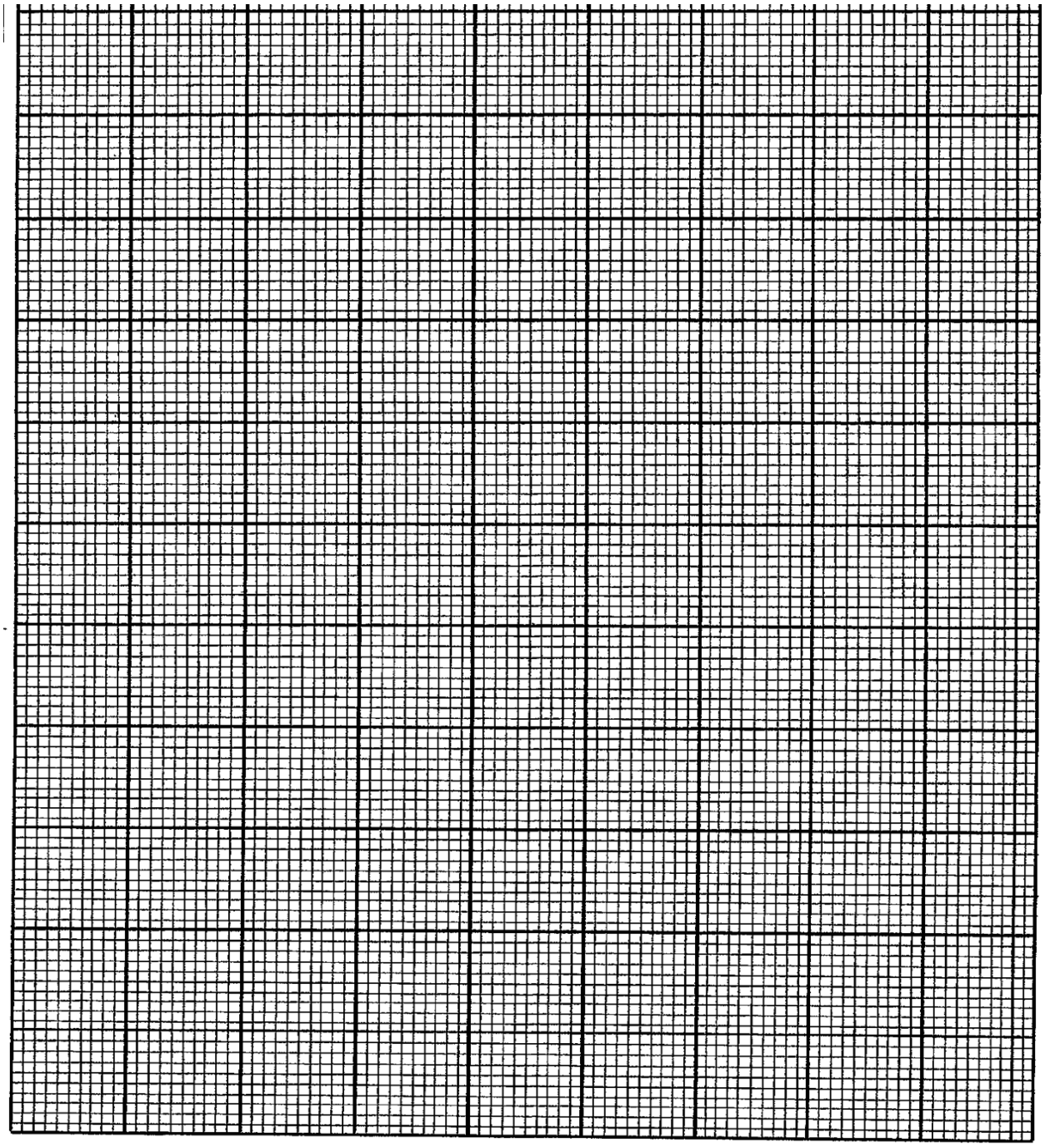

END OF QUESTION PAPER