



ST MARY'S SECONDARY SCHOOL

2026 MSCE POST MOCK EXAMINATIONS

CHEMISTRY

PAPER I

12, MAY, 2026

(100 MARKS)

Subject Number: M052/I

Time Allowed: 2 hours

(8:00-10:00 am)

Instructions

1. This paper contains **12 printed pages**.

Please check.

2. Write your **name** at the top of each page.

3. This paper contains **two** sections, **A** and **B**.

Section **A** consists of **9** short answer question while in section **B** there are **three** restricted questions.

4. Answer all **13** questions in the spaces provided. The maximum number of marks for each question is indicated against each question. Pencil should be used for all drawings

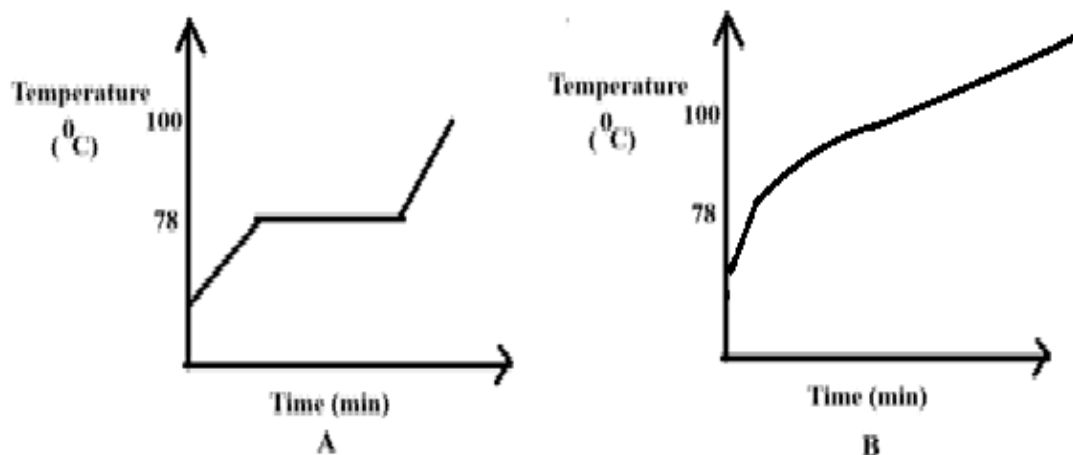
5. Use of **electronic calculators** is allowed.

6. 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		
5		
6		
7		
8		
9		
10		
11		
12		
13		

SECTION A (70MARKS)

1. **a. Figure 1** shows graph curves during the heating process to identify pure ethanol.



i. Which graph represents the heating process of impure ethanol?

_____ (1 mark)

ii. Give a reason for the answer in 1a.

_____ (1 mark)

iii. State any **one** variable that was kept constant during the investigation.

_____ (1 marks)

b. Mention any **two** advantages of water cycle.

_____ (2marks)

c. Suggest any **two** examples of biodegradable wastes.

_____ (2marks)

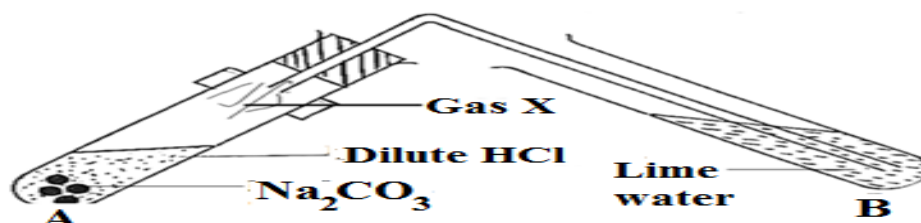
d. Give **one** example of greenhouse gasses.

_____ (1mark)

e. Describe how flooding may lead to global warming.

(3marks)

2. a. Figure 2 below shows a method for testing the presence of anions.



i. Name the Gas labelled X.

(1 mark)

ii. Write a balanced chemical equation for the reaction in test tube A.

(3 marks)

iii. Name the anions being tested in the investigation above?

(1 mark)

iv. Give any **three** ways of preventing rusting

(3marks)

b. Given that letters A, B, C and D represent elements and below is the electrochemical series of these elements. Use E^0 values given to answer the questions that follow.

Table 1

Electrode reaction	E^0/Volts
$A^{2+}(\text{aq}) + 2e^- \rightleftharpoons A(\text{s})$	-2.90
$B^{2+}(\text{aq}) + 2e^- \rightleftharpoons B(\text{s})$	-2.35
$C^+(\text{aq}) + e^- \rightleftharpoons C(\text{g})$	0.00
$D^{2+}(\text{aq}) + 2e^- \rightleftharpoons D(\text{s})$	+0.34
$G^{2+}(\text{g}) + 2e^- \rightleftharpoons G(\text{aq})$	+2.87

i. Which element is likely to be hydrogen?

_____ (1mark)

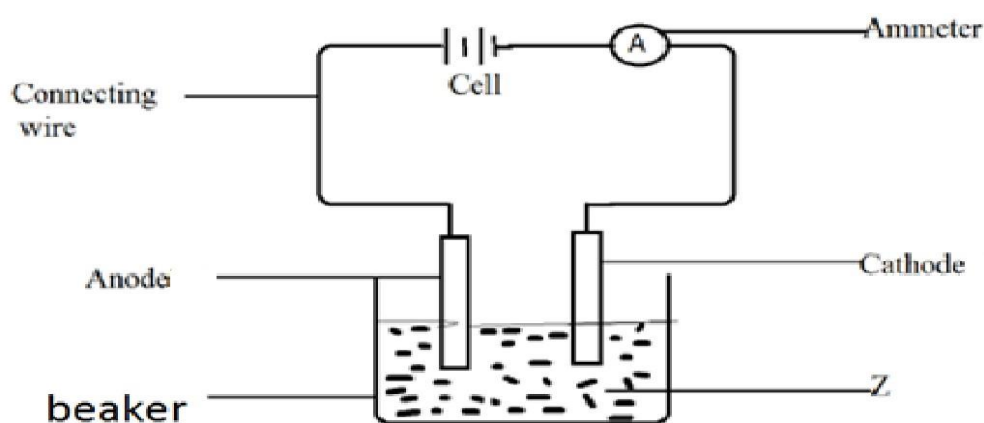
ii. Give a **reason** for your answer.

_____ (1mark)

iii. Calculate the electromotive force for the cell if element **A** and **D** are combined.

(3marks)

3. **Figure 3** below is a diagram showing an experiment which a student carried out in order to purify copper metal.



i. Name the electrolyte **Z** used in purification of copper

_____ (1mark)

b. Write down the ionic half equations for the reactions taking place at each electrode.

Anode _____ (1 mark)

Cathode _____ (1 mark)

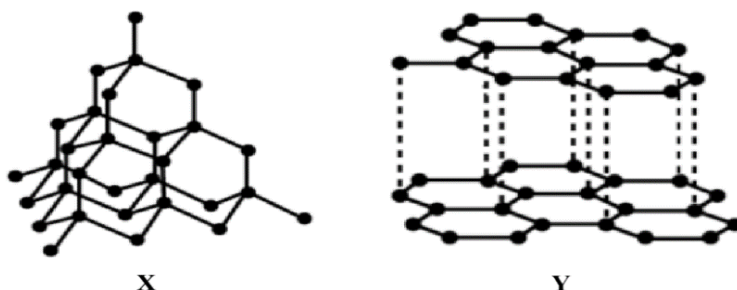
c. Give any **two** evidence that will help the student to know that copper has been purified.

_____ (2 marks)

c. Give any **two** necessary conditions for rusting to take place.

_____ (2marks)

4. a. **Figure 4** shows structures of allotropes of carbon. Use it to answer the questions that follow.



i. Which of the structure of carbon conducts electricity?

_____ (1 mark)

ii. Describe the answer in 4.i.

 _____ (3 marks)

iii. Mention **two** uses of structure labeled Y.

 _____ (2 marks)

b. State **two** similarities between silica and diamond.

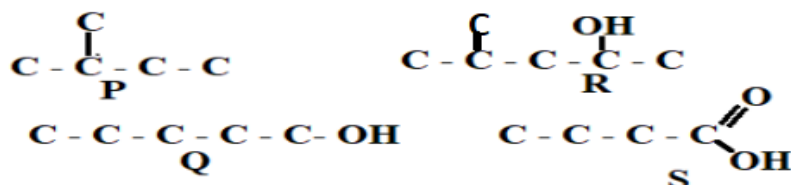
 _____ (2 marks)

5. a. Define the term 'conformer'.

 _____ (1 mark)

NAME OF CANDIDATE _____ FORM 4 _____

b. Below are organic compounds of different homologous series. Use them to answer the questions that follow.



i. To which homologous series does the organic compound Q belong?

_____ (1 mark)

ii. Name the organic compound R.

_____ (1 mark)

iii. Draw **two** possible structural conformers of compound P.

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(2 marks)

iv. Give any **two** chemical properties of organic compound S.

_____ (2 marks)

6. a. What is the difference between polar covalent bond and non-polar covalent bond?

_____ (2 marks)

a. Name any **one** example of a compound with co-ordinate bond.

_____ (1 mark)

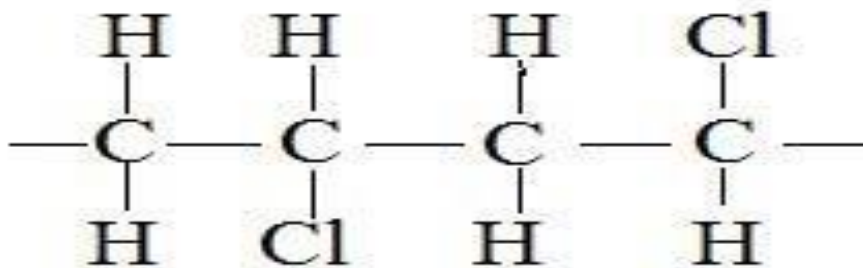
b. Mention any **one** use of metals in relation to their properties.

_____ (1 mark)

7. a. Define polymerization

_____ (1mark)

b. Figure 5 shows a polymer.



i. Name the polymer.

_____ (1 mark)

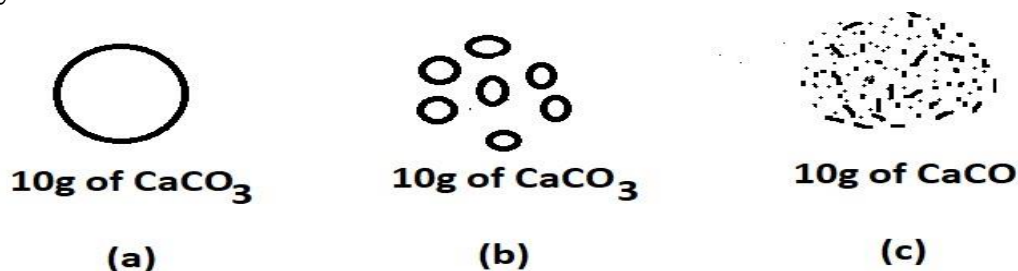
ii. Draw a structural equation to show the formation of polymer in 7.b(i)

(2 marks)

iii. Describe how this polymer was formed.

_____ (4 marks)

8. **Figure 6** shows different surface areas of calcium carbonate (CaCO_3) which were used to react with dilute hydrochloric acid separately in an investigation conducted by form 4 students. Time taken for each reaction was recorded.



- a. What was the aim of the investigation?

_____ (1mark)

- b. Which calcium carbonate will react slowly with dilute hydrochloric acid?

_____ (1mark)

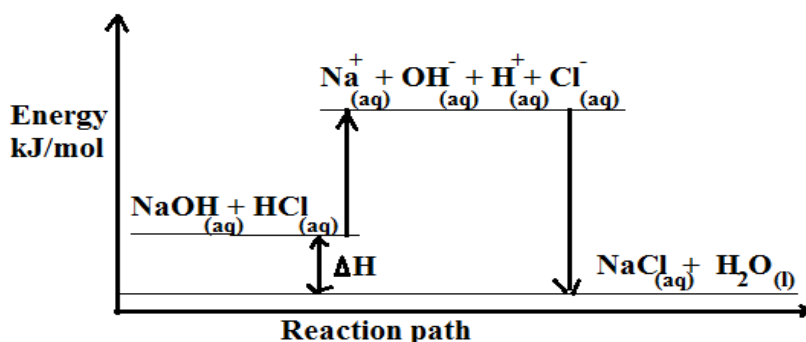
- c. Explain your answer in 8(b).

 _____ (2marks)

- d. State any **one** factor that must be kept constant in the investigation.

_____ (1marks)

9. **Figure 7** shows energy level diagram for the reaction of sodium hydroxide and hydrochloric acid.



- i. State whether the reaction is exothermic or endothermic.

_____ (1 mark)

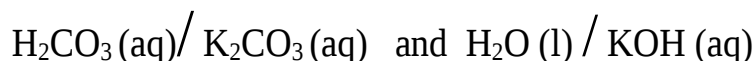
- iii. Give a reason for the answer in 9.b (i).

 _____ (1mark)

10.a Define conjugate base.

 _____ (1mark)

b. Hydrogen carbonate (H_2CO_3) react with potassium hydroxide (KOH) as shown by conjugate acid base pairs below:



i. Write a chemical equation for the reaction

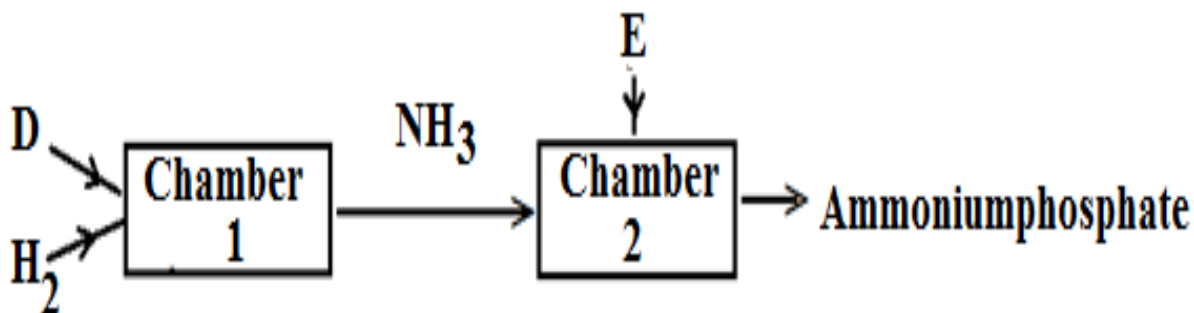
_____ (2marks)

ii. From the chemical equation written in **10.b(i)**, identify the following:

Conjugate acid _____ (1mark)

Conjugate base _____ (1mark)

c. Study the flowchart below and answer the questions that follow.



i. Name the following substances

D. _____ [1]

E. _____ [1]

ii. Give any **two** optimum conditions necessary for the reaction in **chamber 1**.

 _____ (2marks)

SECTION B (30 MARKS)

11. a. With the aid of chemical equations, describe how hydronium ion (H_3O^+) can be formed.

[illegible]

b. Describe how deforestation may lead to water hardness.

[illegible]

12. a. with aid of a well-labelled diagram, describe how Sulphur can be extracted from underground.

(5marks)

b. Describe how to prepare lead (II) sulphate (**PbSO₄**) crystals using lead (II) nitrate [Pb (NO₃)₂] and Magnesium sulphate (MgSO₄).

[illegible]

NAME OF CANDIDATE _____ FORM 4 _____

13. Describe how **250ml** of **0.2M** copper Sulphate (CuSO_4) solution can be

[illegible]

____(10 marks)