EXAMINATION NO.: _____

THE MALAWINATIONAL EXAMINATIONS BOARD

2026 MALAWI SCHOOL CERTIFICATE OF EDUCATION EXAMINATION

CHEMISTRY

Subject Number: M038/I

Wednesday, 8 July

Time Allowed: 2 hours
8:00 – 10:00 am

PAPER I

(100 marks)
Theory

Instructions

1. **This paper contains 11 printed pages. Please check.**
2. Write your **Examination Number** at the top of each page of this question paper.
3. This paper contains two sections, **A** and **B**. Answer **all** the questions in both sections.
4. Use of scientific calculators is allowed.
5. The maximum number of marks for each answer is indicated against 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			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Section A (70 marks)

Answer **all** the **ten** questions in this section in the spaces provided for each question.

1. a. At what stage of a scientific investigation is a hypothesis accepted or rejected?

_____

(1 mark)

b. State any **two** physical ways of treating wastes.

_____

_____

(2 marks)

c. Give any **one** way in which irritating chemical waste can be safely disposed in a laboratory.

_____

(1 mark)

2. a. State any **two** physical properties of nitrogen gas.

_____

_____

(2 marks)

b. Explain the importance of ozone layer.

_____

_____

(2 marks)

c. Why is a damp red litmus paper used when testing for ammonia gas?

_____

_____

_____

(2 marks)

3. a. **Figure 1** shows allotropes of carbon.

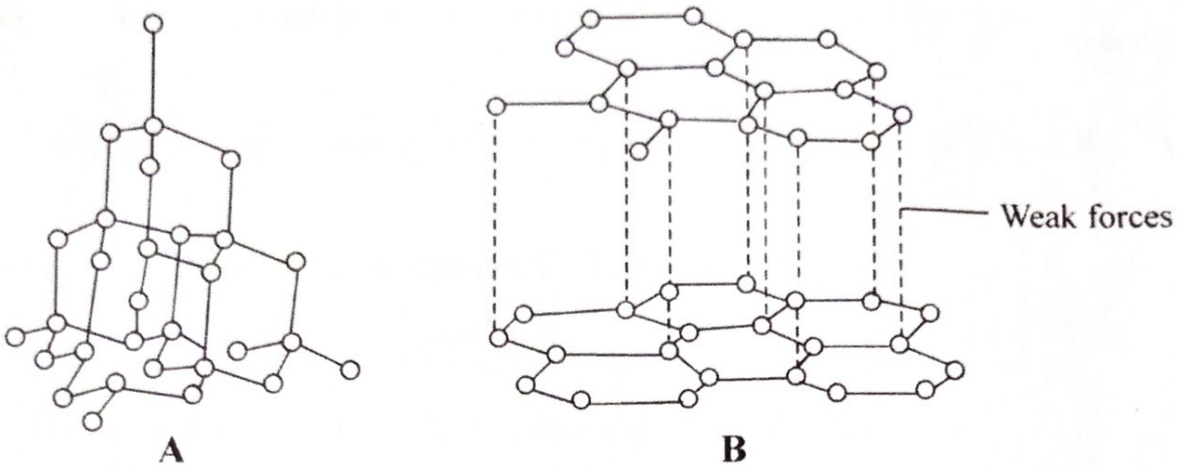

Figure 1

(i) Identify the allotropes labelled **A** and **B**.

A: _____ **(1 mark)**

B: _____ **(1 mark)**

(ii) Which allotrope conducts electricity?

_____

(1 mark)

(iii) Explain the answer in **(ii)**.

_____

_____

_____

(2 marks)

b. Explain any **one** property of silicon dioxide in relation to its structure.

_____

_____

(2 marks)

4. a. Give the **three** types of alkanols.

_____

_____

_____

(3 marks)

b. How does the use of solar energy mitigate the effects of global warming?

_____

_____

(2 marks)

c Explain the effect of burning organic fuels on global warming.

_____

_____

_____

(3 marks)

5. a. State the function of sodium chloride during saponification.

_____

(1 mark)

b. State the **two** components of bronze.

_____

_____

(2 marks)

c. Write a chemical equation for the dehydration of ethanol.

(3 marks)

6. a. Name the type of water hardness which is removed by distillation.

_____

(1 mark)

b. **Figure 2** shows functional groups for organic compounds **W**, **X**, **Y** and **Z**.

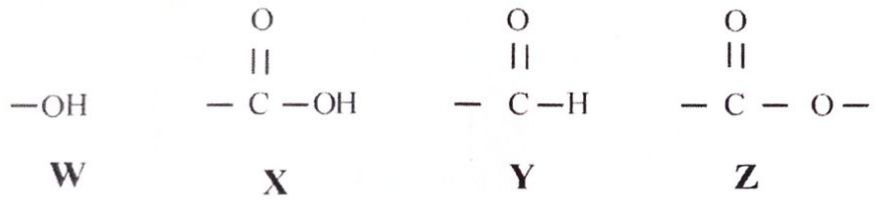

Figure 2

(i) Name functional groups **X** and **Y**.

X: _____ **(1 mark)**

Y: _____ **(1 mark)**

(ii) State any **two** uses of organic compounds whose functional group is **Z**.

_____

_____

(2 marks)

(iii) Describe a test which can be used to distinguish compounds whose functional groups are **W** and **Y**.

_____

_____

_____

_____

(3 marks)

7. a. Give any **two** examples of synthetic polymers.

_____

_____

(2 marks)

b. **Figure 3** shows the structure of a polymer.

Figure 3

(i) Name the polymer.

_____

(1 mark)

(ii) Draw the structure of the monomer for the polymer.

(2 marks)

(iii) Describe the formation of the polymer.

_____

_____

_____

_____

(3 marks)

c. Explain the effect of branching of organic compounds' structures on their boiling points.

_____

_____

_____

_____

(3 marks)

8. a. Give any **two** ways of expressing concentration of a solution.

_____

_____

(2 marks)

b. How does increase in temperature affect the rate of reaction?

_____

_____

_____

(3 marks)

9. a. Give any **two** products for the reaction between an acid and a carbonate.

_____

_____

(2 marks)

b. How many particles are in 66 g of CO_2? (RAM: C = 12, O = 16).

(4 marks)

10. a. Calculate the limiting reagent if 16 g of magnesium reacts with 16 g of chlorine in the reaction below:

$$Mg_{(s)} + Cl_{2(g)} \longrightarrow MgCl_{2(s)}$$ (RAM: Mg = 24, Cl = 35.5).

(5 marks)

b. Calculate the number of moles in 6000 cm^3 of chlorine gas at room temperature and pressure.

(4 marks)

Section B (30 marks)

Answer **all** the **three** questions in this section in the spaces provided.

11. a. With the aid of a well balanced equation, describe how nitrogen is prepared in the laboratory from ammonium chloride and sodium nitrite.

(5 marks)

b. Using chemical equations, describe precipitation as a method of removing water hardness.

(5 marks)

12. a. With the aid of chemical equations, describe the preparation of ethanoic acid by oxidation.

(6 marks)

b. With the aid of half equations, describe the process of corrosion of iron as an oxidation-reduction reaction.

(4 marks)

13. Describe the preparation of 500 cm^3 of 0.2M copper sulphate solution from anhydrous copper sulphate crystals, C_uSO_4. (RAM: Cu = 64, S = 32, O = 16).

(10 marks)

END OF QUESTION PAPER