



Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

JUNE 2025

Stanmorephysics.com

NATURAL SCIENCES

Stanmorephysics.com

70 Marks

90 Minutes

Name: _____

Grade: _____

Instructions:

1. Make sure you have EIGHT (8) printed pages, including this cover page.
2. Read all the questions carefully.
3. Set your work out neatly and correctly.
4. Check your spelling.

QUESTION 1:

MULTIPLE-CHOICE QUESTIONS

Various options are provided as possible answers to the following questions. Choose the correct option and **CIRCLE** the correct letter (A – D) in the blocks provided.

1.1 Why are the elements Li and K in the same group on the periodic table? (1)

- A. Their atomic numbers are the same.
- B. They have similar chemical properties.
- C. Both are non-metals.
- D. They do not react with oxygen.

1.2 In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles.

Which of the diagrams best represents water? (1)



A

B

C

D

1.3 Which of the following statements is true regarding a balanced chemical equation?

- A. The number of atoms of each element is the same on both sides of the equation.
- B. The coefficients represent the mass of the substances in the reaction.
- C. The subscripts can be changed to balance the equation.
- D. Balancing is not necessary for chemical equations.

(1)

1.4 Which of the following substances is considered acidic on the pH scale?

- A. Lemon juice (pH 2)
- B. Baking soda (pH 8)
- C. Table salt (pH 7)
- D. Pure water (pH 7)

1.5 Which of the following represents the formula for sulfur dioxide?

- A. SO
- B. SO₂
- C. S₂O
- D. SO₃

[5]

QUESTION 2:

TERMINOLOGY

Give the correct scientific term for each of the following descriptions. Write only the term in the spaces provided.

2.1. Items on the left of a chemical equation (1)

2.2. _____
The substance formed when carbon is burnt completely in the presence of oxygen.

2.3. _____ (1)
The name of the process where the exposed surface of a metal reacts with oxygen.

2.4. _____ (1)
The product formed when metals react with oxygen.

2.5. A chemical reaction where a strong acid reacts with a strong base to produce a salt.

(1)

[5]

QUESTION 3

MATCHING ITEMS

Choose an item from COLUMN B that matches a statement in COLUMN A. Write only the letter (A – I) next to the question numbers (3.1 to 3.6) in the space provided:

COLUMN A	COLUMN B	
3.1. Diatomic molecule	A. Rusting	3.1
3.2. The process that weakens a metal	B. 7	
3.3. When you mix an equal volume of lemon juice (pH of 2) with a solution of sodium hydroxide (pH of 12). The expected pH will be ...	C. Solid	3.2
	D. Gas	
3.4. The substance used in agriculture to make the soil less acidic.	E. CaCO_3	3.3
	F. Chlorine	
3.5. The state of matter of non-metal oxides at room temperature.	G. Carbon	3.4
	H. 14	
3.6. A non-metal that is essential for the respiration of living organisms and forms CO_2 when it reacts with oxygen	I. Product	3.5
		3.6

[6]

QUESTION 4

4.1. A block, taken from the Periodic table is shown below:



4.1.1 Give any TWO facts about this element that can be deduced from the information provided in the block on the Periodic table. (2)

4.1.2 Is this an example of a metal, non-metal or semi-metal? (1)

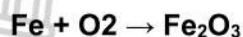
4.1.3. This element reacts with oxygen in the reaction represented by the following unbalanced equation:



Rewrite and balance the equation. (2)

4.1.4. Write one observation which will be made during this reaction. (1)

4.2. The process of rusting is represented by the following unbalanced equation:



4.2.1. Rewrite and balance the equation. (3)

4.2.2. Except oxygen and iron, which other substance should also be present to cause the object to rust? (1)

4.3. Name two ways how rust can be prevented. (2)

[12]

QUESTION 5:

REACTIONS OF OXYGEN WITH NON-METALS.

5.1. When sulfur dioxide dissolves in water, a product is formed called hydrogen sulfide. Hydrogen sulfide is a compound consisting of hydrogen, sulfur and oxygen combining with one another in the relationship 2:1:3.

5.1.1. Write a word-equation for the reaction occurring when sulphur burns in oxygen. (3)


5.1.2. Use the given information to write a suitable formula for hydrogen sulfide. (1)

5.2. The energy in coal comes from the energy stored in plants and other organisms that lived millions of years ago. The energy released by burning coal is used to generate electrical energy in coal-powered power stations.

5.2.1. Write a word equation for coal burning in air (containing oxygen). (3)

5.2.2. Use the symbols/formulae of the substances in question 3.2.1 to represent a chemical equation for the reaction. (3)

5.3. Use the key provided to you below to express the same chemical equation in the form of a particle picture (model) equation. (3)

Key for each element forming part of the chemical reaction		
Element	Carbon	Oxygen
		O

[13]

QUESTION 6:

COMPOUNDS

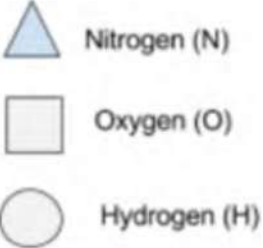

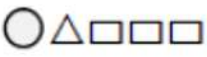
6.1. Fill in the missing words

(7)

Chemical formula	Names of elements in the substance	Name of compound	Fixed ratio of elements
NaCl	Sodium and Chlorine	Sodium Chloride	1 Sodium : 1 Chlorine
Li ₂ O	6.1.1 6.1.2	6.1.3	6.1.4
NH ₃	6.1.5 6.1.6	Ammonia	6.1.7

6.2. Study the key below and write down the formulas for the represented compounds below:

(2)

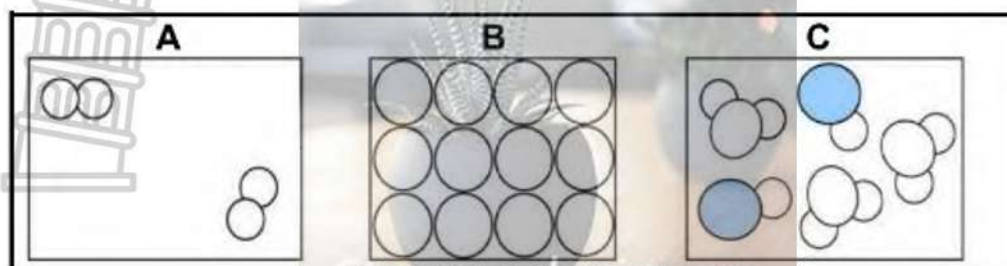
		6.2.1
		6.2.2

[9]

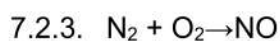
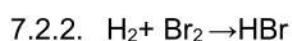
QUESTION 7

CHEMICAL REACTIONS

Study the diagram below and answer the questions that follow.



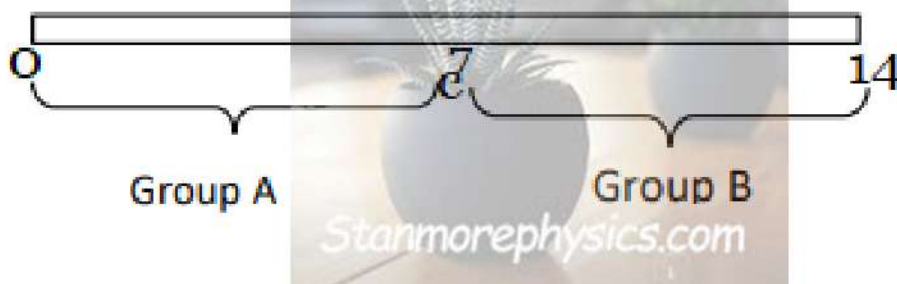
- 7.1. Which diagram, A, B, or C, represents a diatomic molecule? Give a reason for your answer. (2)
- 7.2. Write down the balanced equations for the following reactions: (2)
- 7.2.1. $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$ (2)



[6]

QUESTION 8

Chemicals can be classified into two groups according to a pH scale as shown in the diagram below. Study the diagram and answer the questions that follows:



- 8.1. What do the pH scale measure? (1)
- _____
- 8.2. Write down the name that is given for the substances in group A. (1)
- _____
- 8.3. Write down the name that is given for the substances in group B. (1)
- _____
- 8.4. Name one example of a natural indicator that can determine whether a substance belong to group A, B or C. (1)

8.5. Write down the term that is used for a reaction between a substance from group A and a substance from group B. (1)

8.6. What would happen to the pH of a solution of hydrochloric acid if sodium hydroxide is added to it? Write only INCREASE or DECREASE. (1)

8.7. Classify the following substances either as part of group A or group B substances

8.7.1. Magnesium oxide (MgO): _____ (1)

8.7.2. Nitrogen dioxide (NO₂): _____ (1)

[8]

QUESTION 9

A few learners decide to put a piece of magnesium in concentrated hydrochloric acid.

9.1. Write down the formula for hydrochloric acid. (1)

9.2. A colourless gas and a salt is formed.

9.2.1. Give the name and formula of the colourless gas. (2)

9.2.2. What test can the learners perform to prove the gas is indeed what they think it is? (1)

9.2.3. Give the name and formula of the salt that will form. (2)

[6]

TOTAL: 70