



education

Department of
Education
FREE STATE PROVINCE

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GRADE 9

NATURAL SCIENCES

MEMORANDUM

JUNE 2023

TIME: 1 HOUR

MARKS: 50

This memorandum consists of 5 pages.

SECTION A

QUESTION 1

- | | | |
|-------|-----|------------|
| 1.1.1 | B ✓ | (1) |
| 1.1.2 | D ✓ | (1) |
| 1.1.3 | C ✓ | (1) |
| 1.1.4 | D ✓ | (1) |
| 1.1.5 | B ✓ | (1) |
| | | [5] |

- | | | |
|-------|----|------------|
| 1.2.1 | D✓ | (1) |
| 1.2.2 | A✓ | (1) |
| 1.2.3 | E✓ | (1) |
| 1.2.4 | B✓ | (1) |
| 1.2.5 | C✓ | (1) |
| | | [5] |

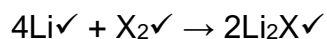
TOTAL SECTION A: 10

SECTION B

QUESTION 2

- | | | |
|-----|---|-----|
| 2.1 | Lithium✓ | (1) |
| 2.2 | Mass number = 7✓ | (1) |
| 2.3 | Number of neutrons = 7 - 3 ✓
= 4 ✓ (Award TWO marks if only the answer is given) | (2) |
| 2.4 | Atomic number = 8✓ | (1) |
| 2.5 | Oxygen✓ | (1) |
| 2.6 | Li / Lithium✓ | (1) |
- Positive marking: mark with mistake**

OR



Marking criteria:

- ✓ 4Li (coefficient of 4 and Li)
- ✓ O₂ or X₂ (one diatomic molecule)
- ✓ 2Li₂O or 2Li₂X (coefficient of 4 and the correct formula)

(3)
[10]

QUESTION 3

3.1 The lid prevents the gas from being released into the air.
The white fumes / sulphur dioxide / product that forms is/are harmful✓ and should not be inhaled. (1)

3.2 Sulphur dioxide✓ (1)

3.3 $S + O_2 \rightarrow SO_2$

Marking criteria	Marks
Both reactants ($S + O_2$) are correct.	1
The product (SO_2) is correct.	1

Penalise with ONE mark, if any incorrect balancing is indicated. (2)

3.4 Acidic✓
The blue litmus paper turned red.✓ (2)

3.5 Non-metal oxides are acidic oxides.✓ (1)
[7]

QUESTION 4

4.1 Rust is a (brittle/flaky) reddish-brown substance✓ that easily crumbles into a powder. (1)

4.2 Iron✓
Oxygen✓ (2)

4.3 $4Fe + 3O_2 \rightarrow 2Fe_2O_3$

Marking criteria	Mark
Both reactants ($Fe + O_2$) are correct.	1
The product (Fe_2O_3) is correct.	1
Coefficients for balancing the equation are correct.	1

(3)

4.4 Iron oxide✓ (1)

4.5 The paint✓ keeps the air / oxygen and the rain / water / moisture away from the iron✓ to prevent rusting. (2)
[9]

QUESTION 5

- 5.1 Hydrochloric acid
 Lemon juice
 Black coffee
 Sodium chloride
 Calcium carbonate
 Magnesium oxide
 Bleach
- ↓
- Most acidic
to
least acidic

OR

Hydrochloric acid, Lemon juice, Black coffee, Sodium chloride, Calcium carbonate, Magnesium oxide, Bleach

Marking criteria	Mark
Most acidic: Hydrochloric acid Least acidic: Bleach	1
Correct order for the other 5 substances	1

(2)

- 5.2 The lower the pH, the higher the acidity.

OR

The higher the pH, the lower the acidity.

Marking criteria	Mark
Mention both variables: pH and acidity	1
Indicate the RELATIONSHIP between the variables.	1

(2)

- 5.3 Black coffee with a pH of 5 is acidic and will not be able to neutralise the stomach acid✓causing heartburn.

(1)

- 5.4.1 Green✓

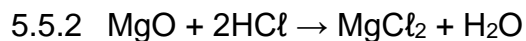
(1)

- 5.4.2 Dark purple✓

(1)

- 5.5.1 As the basic/alkaline magnesium oxide✓ is added to the acid, a neutralisation reaction takes place with the acid becoming less acidic / more basic✓ and the pH of the solution increasing from 1 to 6.

(2)



Marking criteria	Mark
Both reactants ($\text{MgO} + \text{HCl}$) correct; in any order	1
Both products ($\text{MgCl}_2 + \text{H}_2\text{O}$) correct; in any order	1
Coefficients for balancing the equation (<u>2</u> HCl)	1

(3)

5.6 Calcium carbonate✓

Calcium carbonate is a base / has a pH of 9 and will neutralise the acidic soil and lower the acidity of the soil. ✓

OR

Calcium carbonate with a pH of 9 will neutralise the acidic soil and increase the pH of the soil. ✓

(2)

[14]

TOTAL SECTION B: 40
GRAND TOTAL: 50