Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

AMATHOLE WEST DISTRICT

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GRADE 10

PHYSICAL SCIENCES

JUNE 2025

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MEMORANDUM

MARKS: 100

THIS MEMORANDUM CONSISTS OF 7 PAGES INCLUDING THE COVER PAGE.

QUESTION 1

1.1 B✓✓ (2)

1.2 C✓✓ (2)

1.3 B✓✓ (2)

1.4 C✓✓ (2)

1.5 D✓✓ (2)

1.6 A✓✓ (2)

1.7 D✓✓ (2)

[14]



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QUESTION 2

2.1.1 9 V✓ (1)

2.1.2 0 V✓ (1)

2.2 $R = \frac{V}{I}$ ✓

$12 = \frac{9}{I}$ ✓

$I = 0{,}75\ A$ ✓ (3)

2.3 **Positive marking from 2.2**

$I = \frac{Q}{\Delta t}$ ✓

$0{,}75 = \frac{Q}{6\times60}$ ✓

$Q = 270C$ ✓ (4)

2.4.1 The rate of flow of charge. ✓✓ (2)

2.4.2 **Positive marking from 2.2**

OPTION 1	**OPTION 2**
$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓	$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓
$\frac{1}{R_P} = \frac{1}{4} + \frac{1}{12}$ ✓	$\frac{1}{R_P} = \frac{1}{4} + \frac{1}{12}$ ✓
$R_P = 3\Omega$	$R_P = 3\Omega$
$R_{TOT} = 3 + 8 = 11\Omega$	$R_{TOT} = 3 + 8 = 11\Omega$
$I = \frac{V}{R} = \frac{9}{11}$ ✓ $= 0{,}8182\ A.$	$I = \frac{V}{R} = \frac{9}{11}$ ✓ $= 0{,}8182\ A.$
$I_X = \frac{1}{4}$ ✓ $\times 0{,}8182$ ✓	$V_2 = IR = 0{,}8182 \times 3$ ✓
$I_X = 0{,}20455A$ ✓	$V_2 = 2{,}4546V$
	$I = \frac{V}{R}$
	$I = \frac{2{,}4546}{12}$ ✓
	$I = 0{,}20455A$ ✓

(6)

[17]

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QUESTION 3

3.1.1 A pure substance which consists of only one type of atom. ✓✓ (2)

3.1.2 Air.✓ (1)

3.1.3 Copper.✓ (1)

3.1.4 Sulphur.✓ (1)

3.1.5 Carbon dioxide.✓ (1)

3.2.1 Thermometer.✓ (1)

3.2.2 The temperature at which a solid, given sufficient heat, becomes a liquid. ✓✓

OR

The temperature at which the liquid and solid phases of a substance are at equilibrium. ✓✓ (2)

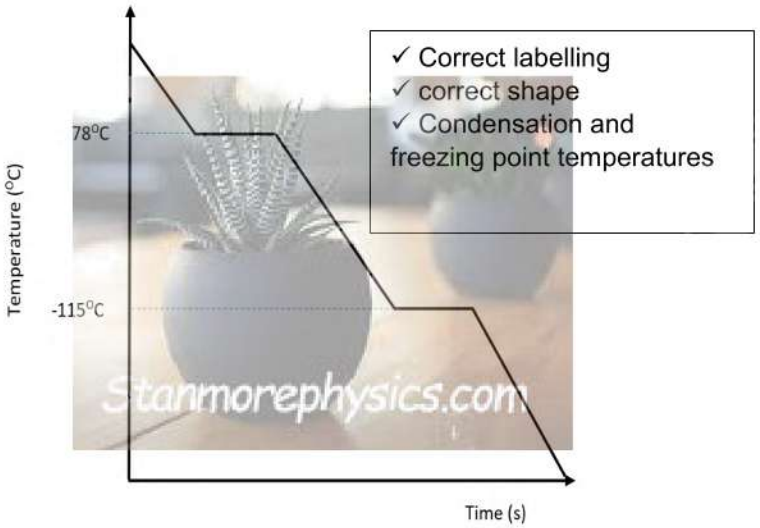
3.2.3 $-115°C$. ✓ (1)

3.2.4 Liquid. ✓ (1)

3.2.5
- The heat supplied is used to overcome the attractive or intermolecular forces (holding the liquid molecules together). ✓
- The molecules move further apart from one another. ✓
- They are converted from liquid to gas. ✓ (3)

3.2.6 Water. ✓ (1)

3.2.7



(3)

[18]

QUESTION 4

4.1.1 The mass of an atom on a scale where an atom of carbon-12 has a mass of 12. ✓✓ (2)

4.1.2

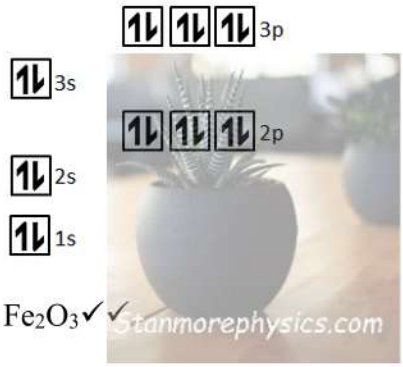
$$Ar = \frac{(63\checkmark \times 75)+(65 \times 25)\checkmark}{100} \checkmark$$

$$Ar = 63{,}5 \checkmark$$

✓63
✓ (65×25)
✓substitution

(4)

4.2



✓ 3p orbital
✓ 2p and 3s orbitals
✓ 1s and 2s orbitals

(3)

4.3 Fe_2O_3 ✓✓ (2)

[11]

5.1.1 The energy needed per mole to remove an electron from an atom in the gaseous phase. ✓✓ (2)

5.1.2 Decreases. ✓

- Extra energy levels (orbitals are added). ✓
- Valence electrons are now far away from the nucleus and the strength of the nuclear attraction on valence electrons decreases.✓ (3)

5.1.3 Mg: $1s^2 2s^2 2p^6 3s^2$✓

Al: $1s^2 2s^2 2p^6 3s^2 3p^1$✓ (2)

5.1.4

- The valence electrons of Magnesium are closer to the nucleus than that of aluminium. ✓
- There is a stronger nuclear attraction of the valence electrons in magnesium compared to aluminium. ✓ (2)

5.1.5 $Al + energy \longrightarrow Al^+ + e^-$ ✓LHS ✓RHS (2)

5.2.1 Na ✓ (1)

5.2.2 Mg ✓and Cl✓ (2)

5.2.3 Ar✓ (1)

5.2.4 Si✓ (1)

5.2.5 Na✓ (1)

5.2.6 Cl✓ (1)

[18]

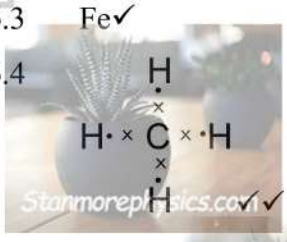
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6.1 The mutual attraction between two atoms resulting from the simultaneous attraction between their nuclei and the outer electrons. ✓✓ (2)

6.2.1 Ionic bond✓ (1)

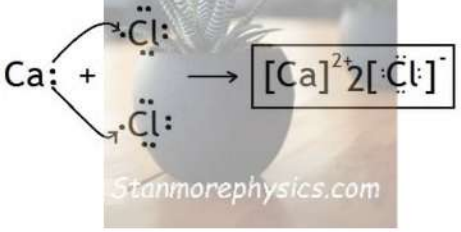
6.2.2 Covalent bond✓ (1)

6.3 Fe✓ (1)

6.4 

✓✓ (2)

6.5 Zero / None ✓ (1)

6.6 

✓ reactants
✓ Ca^{2+}
✓ $2Cl^-$

(3)

[11]

QUESTION 7

7.1.1 Experiment 1. ✓ (1)

7.1.2 Experiment 1.✓ (1)

7.2 $Pb(NO_3)_2 + 2NaI \longrightarrow 2NaNO_3 + PbI_2$ ✓ (1)

7.3

LHS	RHS
207 + 2(14) + 6(16) + 2(23) + 2(127) ✓ = 631	2(23) + 2(14) + 6 (16) + 207+ 2(127) ✓ = 631✓

(3)

7.4.1 Decomposition. ✓ (1)

7.4.2 Mass of oxygen gas (O_2) in reaction 1 = 20 - 10,59 = 9,41g. ✓

Mass of oxygen gas (O_2) in reaction 2 = $\frac{9,41}{20}$✓ × 52✓ = 24,466g. ✓ (4)

[11]

TOTAL [100]