Province of the
EASTERN CAPE
EDUCATION

OR TAMBO INLAND DISTRICT

GRADE 10

PHYSICAL SCIENCES PAPER

JUNE 2024

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MEMORANDUM

MARKS: 97

THIS MEMORANDUM CONSISTS OF 8 PAGES INCLUDING THE COVER PAGE.

QUESTION 1

1.1 C✓✓ (2)

1.2 D✓✓ (2)

1.3 D✓✓ (2)

1.4 C✓✓ (2)

1.5 B✓✓ (2)

QUESTION 2

2.1.1 The temperature at which the vapour pressure of a substance equals the external (atmospheric) pressure. ✓✓ (2)

2.1.2 D✓ (1)

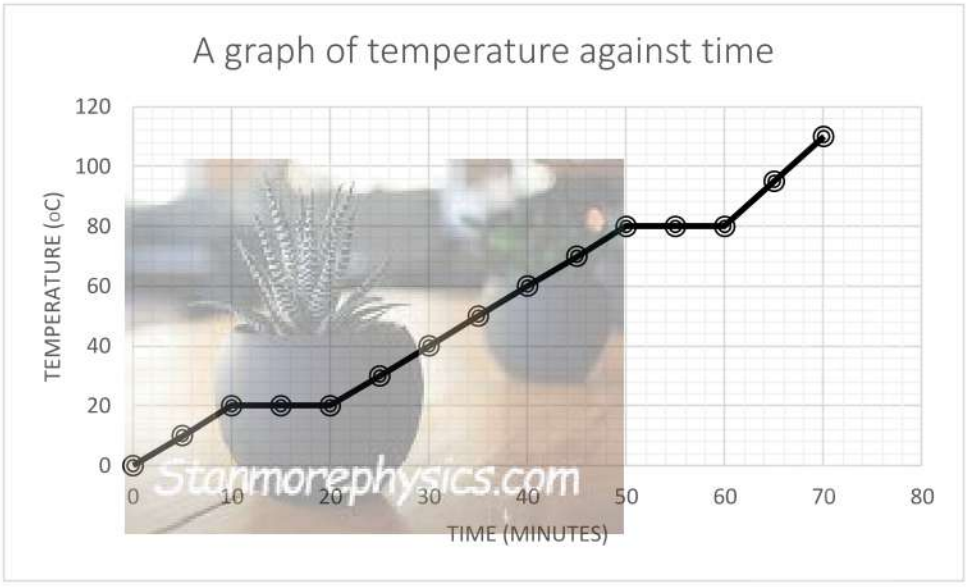
2.1.3 B✓ (1)

2.1.4 C✓ (1)

2.2.1 To determine the heating curve of substance S. ✓ OR

To determine how temperature changes over time as substance S is heated. ✓ (1)

2.2.2



Correctly plotted points for 0 to 20 minutes ✓

Correctly plotted points for 20 to 50 minutes ✓

Correctly plotted points for 50 to 70 minutes ✓

Shape of graph ✓

(4)

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2.2.3 The heat supplied is used to overcome the intermolecular forces ✓between the solid molecules converting them from a solid to a liquid✓. (2)

2.2.4 80°C ✓ (1)

2.2.5 Gas ✓ (1)

2.2.6 Increases ✓ (1)

2.3.1 A substance that cannot be separated into simpler components by physical methods. ✓✓ (2)

2.3.2 S_8 or Cl_2 Any one ✓ (1)

2.3.3 Homogeneous mixture ✓ (1)

[19]

QUESTION 3

3.1.1 Atoms of the same element having the same number of protons but different number of neutrons. ✓✓ (2)

3.1.2 $Ar = \frac{56\times91,75}{100}$ ✓ $+ \frac{54\times5,86}{100}$ ✓ $+ \frac{57\times2,39}{100}$ ✓ $= 55,91.$ ✓ (4)

3.1.3 Iron ✓ (1)

3.2.1 19 ✓ (1)

3.2.2 20 ✓ (1)

3.2.3 1 ✓ (1)

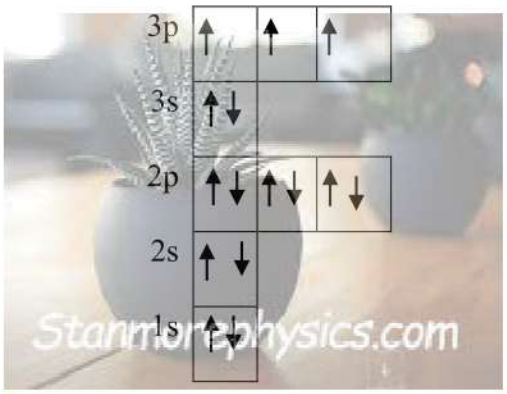
3.2.4 Alkali metals. ✓✓ (2)

3.3 $CaSO_4$ ✓ (2)

3.4 Lead (II) nitrate. ✓✓

Award only 1 mark if answer is: lead nitrate. (2)

3.5



✓ Energy levels 1 and 2

✓ Energy level 3 (2)

[18]

QUESTION 4

4.1.1 E ✓ (1)

4.1.2 B or K ✓ (1)

4.1.3 B or K ✓ (1)

4.1.4 E ✓ (1)

4.1.5 L ✓ (1)

4.1.6 E ✓ (1)

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

4.3 Increases. ✓

Number of protons / atomic number increases from left to right across the period.

Effective nuclear charge increases / the nucleus pulls the outermost orbital much closer to itself. ✓ (3)

More energy is therefore required to remove an electron. ✓

[11]

QUESTION 5

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

5.2.1 Covalent bond. ✓ (1)

5.2.2 Ionic bond. ✓ (1)

5.2.3 Metallic bond. ✓ (1)

5.3 

(4)

5.4 A change in which no new substances are formed. ✓✓ (2)

5.5.1 Chemical change. ✓ (1)

5.5.2 $4\ Fe + 3\ O_2 \longrightarrow 2\ Fe_2O_3$

Reactants ✓ Product ✓ Balancing ✓ (3)

5.5.3

LHS	RHS
$4(56) + 3(2 \times 16)$ ✓	$2[2(56) + 3(16)]$ ✓
$= 320$	$= 320$ ✓

LHS = RHS (3)

[18]

QUESTION 6

6.1 The net charge of an isolated system remains constant during any physical process. ✓✓ (2)

6.2 EXCESS✓ (1)

6.31 FROM B TO A. ✓ (1)

6.3.2 $Q = \frac{Q_1+Q_2}{2}$ ✓

$Q = \frac{5\times10^{-9}+(-2\times10^{-2})}{2}$ ✓

$Q = +1.5 \times 10^{-9}C$ ✓ (3)

6.3.3 $n = \frac{Q}{q_e}$ ✓

$n = \frac{+1.5\times10^{-9}}{1.6\times10^{-19}}$✓

$n = 9.375 \times 10^{9}\ electrons$ ✓ (3)

6.4.1 When the charged plastic ruler is brought closer to the uncharged pieces of paper, the paper is polarised✓. The negative charges on the paper are repelled by the negative charges on the ruler. This leaves the side of the paper closest to the ruler positive. ✓ (2)

[12]

QUESTION 7

7.1 Potential difference across the ends of a conductor is the energy transferred per unit electric charge flowing through it. ✓✓ (2)

7.2.1 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

$\frac{1}{R_p} = \frac{1}{3} + \frac{1}{6}$ ✓

$R_p = 2\ \Omega$

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$R_T = 2+4$✓

$= 6\Omega$✓ (4)

7.2.2 $V_2 = IR$✓

$= (2)(4)$ ✓

$= 8$ V✓ (3)

7.3. NO SOLUTION

[9]

TOTAL 97