GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

JUNE 2024

GRADE 10

MARKING GUIDELINES

PHYSICAL SCIENCES

7 pages

QUESTION 1

1.1 C ✓✓ (2)

1.2 B ✓✓ (2)

1.3 A ✓✓ (2)

1.4 D ✓✓ (2)

1.5 D ✓✓ (2)

1.6 C ✓✓ (2)

1.7 B ✓✓ (2)

1.8 D ✓✓ (2)

1.9 B ✓✓ (2)

1.10 A ✓✓ (2)

[20]

QUESTION 2

2.1 Seawater ✓ OR air (1)

2.2 2.2.1 H_2O ✓ (1)

2.2.2 N_2 ✓ (1)

2.3 2.3.1 pure ✓ (1)

2.3.2 pure ✓ (1)

2.4 Oxygen is a substance that cannot be separated into simpler components by physical methods. ✓ ✓ (2)

[7]

QUESTION 3

3.1 liquid ✓ (1)

3.2 The temperature of a liquid at which its vapour pressure equals the external pressure. ✓✓ (2)

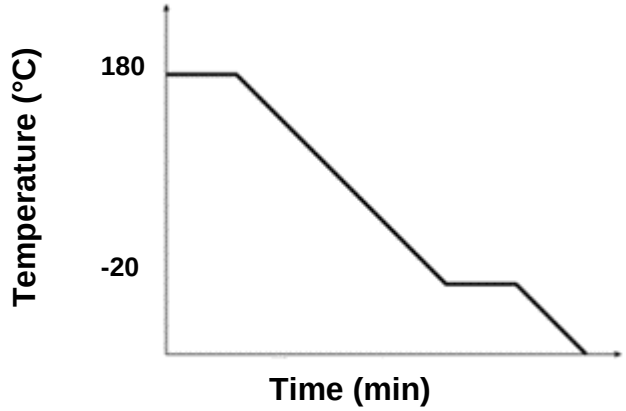
3.3 90 °C ✓ (1)

3.4 3.4.1 solid ✓ (1)

3.4.2 liquid ✓ (1)

3.4.3 gas ✓ (1)

3.5 Cooling curve



✓ 180 °C

-✓ 20 °C

✓ Shape starting at boiling point and horizontal during condensation and freezing (3)

(-1 mark if the y- and x- axes not labelled) **[10]**

QUESTION 4

4.1 Bond as the sharing of electrons between atoms to form molecules. ✓✓ (2)

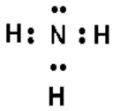
4.2 4.2.1 NH_3 or HF ✓ (1)

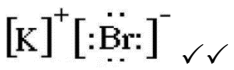
4.2.2 Cu ✓ (1)

4.2.3 KBr ✓ (1)

4.3 Potassium (K) is a metal and bromine (Br) is a non-metal, ionic bond formed by the transfer of an electron from potassium to bromine. ✓ (1)

4.4 Bond that involves the transfer of electrons to form cations and anions that attract each other to form a formula-unit. (2)

4.5 4.5.1  ✓✓ (2)

4.5.2  ✓✓ (2)

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QUESTION 5

5.1 Bring a magnet close to the material (iron, cobalt or nickel). ✓
If it is attracted by the magnet, it is magnetic. If not, it is non-magnetic. ✓ (2)

5.2 5.2.1 The number of protons in an atom of an element. ✓ (1)

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

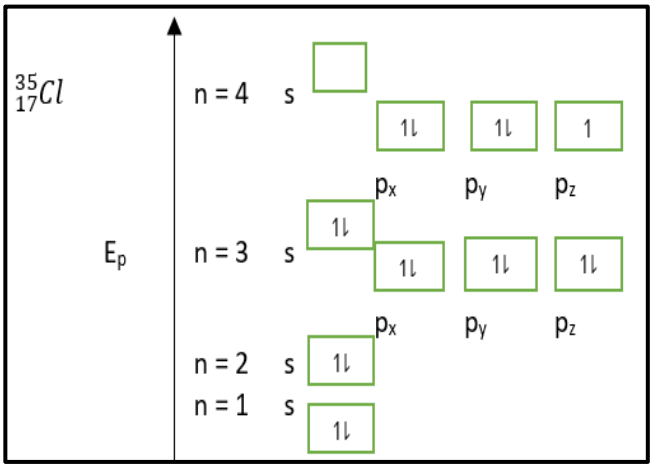
5.3 5.3.1 mass number ✓ (1)

5.3.2 $A_r(Ni) = \frac{(58 \times 68,27) + (60 \times 26,10) + (61 \times 1,13) + (62 \times 3,59) + (64 \times 0,91)✓}{100✓}$

$A_r(Ni) = 58,75$ ✓ (3)

5.4 $CoC\ell_3$ ✓ (1)

5.5



✓ n = 3 correct

✓ n = 2 correct

✓ n = 1 correct

(3)

5.6 +3/Fe^{3+}/*iron* (III)-ion ✓ (1)

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QUESTION 6

6.1 The amount of substance having the same number of particles as there are atoms in 12 g carbon-12. ✓✓ (2)

6.2 6.2.1

$n = \frac{m}{M}$

$n = \frac{5}{65}$ ✓② M(Zn) correct substitute

n = 7,69 x 10^{-2} mol Zn

n(Zn) : n(HCℓ)

1 : 2 ✓① both formulae

7,69 x 10^{-2} : 1,54 x 10^{-1}

$c = \frac{n}{V}$

$c = \frac{1,54 \times 10^{-1}}{400 \times 10^{-3}}$ ✓③ substitution

c = 0,38 mol·dm^{-3} HCℓ ✓④ answer with unit (4)

6.2.2 n(Zn) : n(H_2)

1:1

7,69 x 10^{-2} : 7,69 x 10^{-2}

$n = \frac{V}{V_m}$ ✓① formula

$7,69 \times 10^{-2} = \frac{V}{22,4}$ ✓② substitution

V = 1,72 dm^3 H_2 ✓③ answer with unit (3)

6.2.3 $n = \frac{m}{M}$

$7{,}69 \times 10^{-2} = \frac{m}{2}$ ✓① substitution

m = 0,15 g H_2 escaped ✓② answer with unit (2)

[11]

QUESTION 7

7.1 Resistance is the ratio of potential difference to current/ measure of the position to current flow in an electric circuit. ✓✓ (2)

7.2 7.2.1 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓

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

$R_P = 2\ \Omega$

$R_T = R_1 + R_2$

$R_T = 2 + 4$

$R_T = 6\ \Omega$ ✓ (3)

7.2.2 $Q = I\Delta t$ ✓

$Q = (2)(60)$ ✓

$Q = 120\ C$ ✓ (3)

7.3 Decreases. ✓

Total resistance increases in series as total current decreases/Resistance is inversely proportional to the current. ✓ (2)

[10]

QUESTION 8

8.1 What is the relation between current and adding more cells connected in series?/
What is the relationship between current and voltage for cells connected in series? ✓✓ (2)

8.2 work done per unit charge by the source (battery). ✓✓ (2)

8.3 8.3.1 Voltage ✓ (1)

8.3.2 Current ✓ (1)

8.4 The brightness of the light bulbs will increase since voltage is directly proportional to current. ✓✓ (2)

8.5 1,5 x 10 = 15 V ✓✓ (2)

8.6 $Q = I\Delta t$
$Q = 24 \text{ x } 120$ ✓
$Q = 2\,880\ C$
$V = \frac{W}{Q}$ ✓
9 ✓ $= \frac{W}{2\,880}$ ✓
$W = 25\,920\ J$ ✓ (5)

8.7 As more cells are added in series, the total voltage of the circuit increases thus increasing the total current. ✓ (1)
[16]

TOTAL: 100