

**PHYSICAL SCIENCES GRADE 10**

**QUESTION 1**

- 1.1 Temperature (1)
- 1.2 Decomposition (1)
- 1.3 Electronegativity (1)
- 1.4 Constant composition/proportion/ratio (1)
- 1.5 Ionic (1)
- [5]**

**QUESTION 2**

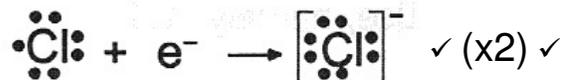
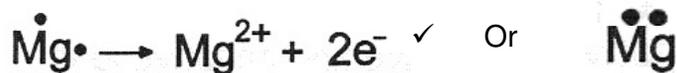
2.1	A	B	C	<del>D</del>
2.2	A	<del>B</del>	C	D
2.3	A	B	C	<del>D</del>
2.4	<del>A</del>	B	C	D
2.5	A	B	<del>C</del>	D

**[15 X 2 =10]**

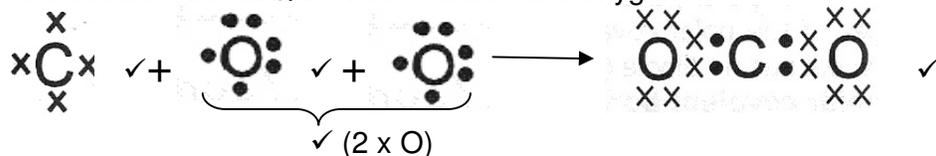
**TOTAL SECTION A : 15 MARKS**

**QUESTION 3**

- 3.1.1 Hydrogen of one molecule ✓ is bonded to a highly e – negative atom in another ✓ molecule (2)
- 3.1.2 The electrostatic attraction ✓ between sea of delocalised electrons ✓ and positive atomic kernels ✓ (or cations) (2)
- 3.1.3 The atoms glide ✓ over each other without breaking ✓ (or because the sea of delocalised electrons are always present) (2)
- 3.2.1 the ionic bond between magnesium and chlorine (4)



3.2.2 the covalent bonding between carbon and oxygen (4)



3.3.1 Boiling point increases ✓ as molecular mass increases ✓ (or down in a group on periodic table) (2)

3.3.2 Vd Waals forces increase with increase in molecular mass ✓, more energy needed to break the bonds ✓, thus higher temperature means more energy used to break bonds ✓ (3)

**[19]**

#### **QUESTION 4**

4.1 The trends show that HF and H<sub>2</sub>O should have BP lower ✓ than H<sub>2</sub>S and HCl, but it is (in fact) much higher than expected. ✓ (2)

4.2 There are H-bonding between H<sub>2</sub>O and HF molecules ✓, these are stronger than the Vd Waals forces between the other molecules ✓ and therefore more energy needed to break the bonds ✓, thus higher temp reached for BP. (3)

**[5]**

#### **QUESTION 5**

5.1 A ✓ (1)

5.2 carbon ✓ (or C) (1)

5.3 B is conducting ✓ and A not ✓. B has 1 extra valence electron not taking part in bonding ✓ (3)

5.4 Glass ✓ (or sandpaper) (1)

5.5 covalent ✓ (1)

**[7]**

#### **QUESTION 6**

6.1 Physical ✓  
Only a rearrangement of molecules occurs ✓, with the composition of molecules remaining unchanged. ✓ (3)

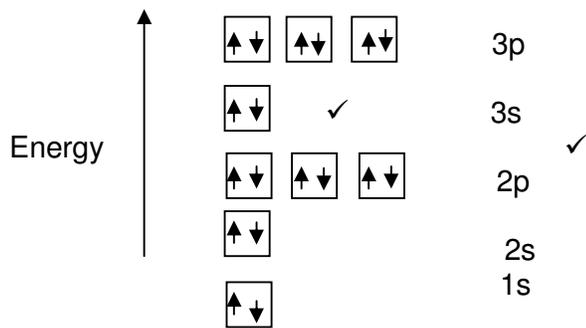
6.2.1 liquid to a gas ✓ (1)

6.2.2 cooling ✓ (1)

6.3.1 Melting is the process ✓ of phase change from solid to liquid ✓ and melting point is the temperature ✓ at which the phase change occurs. (3)

6.3.2 S + Fe ✓ → FeS ✓ ✓ (bal.) (3)

6.3.3



(2)

6.4 NaCl ✓

(1)

6.5.1 Because chlorine occurs as isotopes ✓ they have different number of neutrons. ✓  
 Element that has the same atomic mass but different mass number OR  
 An element with the same number of protons but different number of neutrons. ✓✓

(2)

6.5.2 relative atomic mass =  $\frac{(68.9257 \times 60.4\%) + (70.9249 \times 39.6)}{60.4 + 39.6}$  ✓ = 69,7174 ✓

Gallium ✓

(3)

6.6.1 Sunflower oil. ✓

(1)

6.6.2 Heterogeneous. ✓

(1)

**[21]**

**QUESTION 7**

7.1 4 ✓

(1)

7.2  $\text{SiO}_2(\text{s}) + 2\text{C}(\text{s}) \rightarrow \text{Si}(\text{l}) + 2\text{CO}(\text{g})$  ✓(bal.) ✓(correct phase for products)

(4)

7.3 Any one.

Harmful CO is a product

Temperatures of 3 000 °C requires enormous amounts of electricity.

Coal is a non-renewable resource ✓

(1)

7.4 Law of Conservation of mass ✓

(1)

7.5 Carbon ✓

(1)

**[8]**

**TOTAL: 75 MARK**