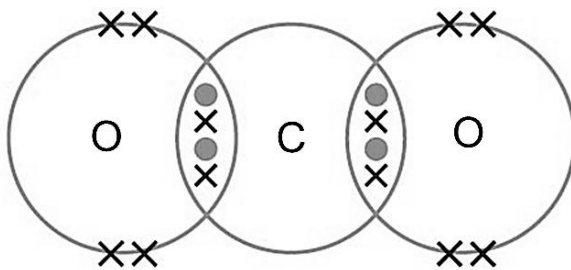


Paper 4

Qn	Answer				Mark		
1	(a)					3 correct-1m All correct -2m	
		atom	nucleon number	number of protons	number of neutrons		number of electrons
		oxygen-17	17	8	9		8
		oxygen-18	18	8	10		8
	(b)	(i)	Source: Volcanoes/ combustion fossil fuels Effect: irritates eyes and lung/ causes breathing difficulties/ dissolves in rainwater to form acid rain which corrode metals, buildings and harm aquatic living organisms. (anyone answer)				1 1
		(ii)	test: bubble gas into limewater Observation: white precipitate formed in limewater				1 1
		(iii)					Correct no. of electrons – 1m Correct sharing of and ratio of atoms – 1m
							8 m
2	(a)	All these elements have the same number of <u>7 electrons in their outer shell/valence shell.</u>				1	
	(b)	1. colour intensity increases 2. melting and boiling point increases (any one) A: Colour gets darker				1	
	(c)	Chlorine is <u>more reactive</u> than iodine [1] When chlorine comes into contact with potassium iodide, <u>chlorine displaced iodine from potassium iodide to form brown iodine solution.</u> [1]				2	
	(d)	arrangement: closely packed and disorderly arranged movement: particles slide past each other.				1 1	

			6 m
Qn		Answer	Mark
3	(a)(i)	There is presence of C=C / carbon-carbon double bond	1
	(a) (ii)	Observations with margarine: aqueous bromine remains red-brown. Observation with vegetable oil: aqueous bromine turns from red-brown solution to colourless/ decolourise.	1 1
	(b) (i)	$C_2H_4 + Cl_2 \rightarrow C_2H_4Cl_2$	1
		$ \begin{array}{c} H \quad H \\ \quad \\ H-C - C-H \\ \quad \\ Cl \quad Cl \end{array} $	1
	(ii)	Mr of $C_6H_{12} = 6 \times 12 + 12 \times 1 = 84$ Mass = $15 \times 84 = 1260 \text{ g} / 1.26 \text{ kg}$	1 1
	(iii)	Poly(hexene) R: wrong spelling	1
			8 m
4	(a)(i)	Oxygen in air is used up during reaction with iron.	1
	(ii)	Painting/ greasing/ cover with plastic [any possible ans]	1
	(iii)	$Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$	1
	(b)(i)	most reactive R Q least reactive S	1
	(ii)		Correct no. of electrons – 1m Correct charges and ratio – 1m
		Magnesium oxide has a giant crystal lattice structure. There are <u>strong electrostatic forces of attraction between the opposite charged ions</u> [1]. <u>A large amount of energy is required to overcome these forces of attraction</u> [1], hence it has high melting point.	2

			8 m
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Qn		Answer	Mark																											
5	(a)	<table><tr><th colspan="3">experiment with zinc</th></tr><tr><th>mass of zinc/ g</th><th>highest temperature recorded/ °C</th><th>temperature rise/ °C</th></tr><tr><td>0.0</td><td>25.0</td><td>0.0</td></tr><tr><td>0.2</td><td>27.5</td><td><u>2.5</u></td></tr><tr><td>0.4</td><td>29.9</td><td><u>4.9</u></td></tr><tr><td>0.6</td><td>32.4</td><td><u>7.4</u></td></tr><tr><td>0.8</td><td>33.0</td><td>8.0</td></tr><tr><td>1.0</td><td>33.0</td><td>8.0</td></tr><tr><td>1.2</td><td>33.0</td><td>8.0</td></tr></table>	experiment with zinc			mass of zinc/ g	highest temperature recorded/ °C	temperature rise/ °C	0.0	25.0	0.0	0.2	27.5	<u>2.5</u>	0.4	29.9	<u>4.9</u>	0.6	32.4	<u>7.4</u>	0.8	33.0	8.0	1.0	33.0	8.0	1.2	33.0	8.0	All correct - 1m
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	(i)	correct plotting, 7 points	1																											
	(ii)	Two intersecting straight lines	1																											

		Temperature rise / °C Mass of metal / g	
	c(i)	0.33 g (value form the graph)	1
	c(ii)	0.65 g (value form the graph)	1
	(d)	$\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$	1
	(e)	No change/ no rise in temperature / temperature reading remains at 25 °C Silver metal is <u>less reactive than</u> copper metal. <u>Silver cannot displace copper</u> from its salt solution.	1 1
			8 m