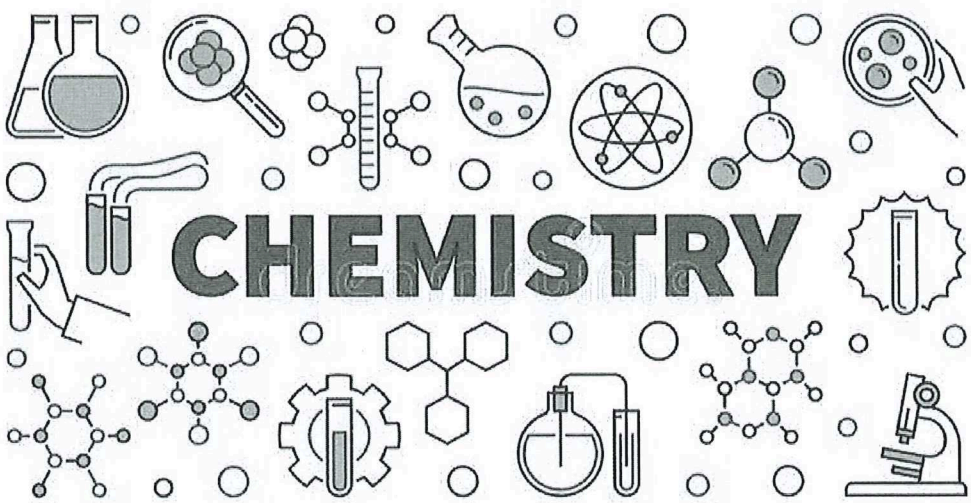

WJEC Chemistry 1

Option – Higher Tier

1.4 Mark Scheme

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
9				**Indicative content** Destructive plate boundary • oceanic and continental plates moving towards one another • more dense oceanic plate forced under less dense continental plate • friction causes earthquakes, subducted plate melts, rising magma forms volcanoes, mountain building • example named or shown on diagram Constructive plate boundary • plates move apart • magma wells up to fill gap • new igneous rock forms, sea-floor spreading • example named or shown on diagram Reference to conservative boundaries is irrelevant	6			6		
				5-6 marks Both boundary types discussed, good detail for both *There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.* **3-4 marks** Some detail relating to both types or one type with good detail *There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.* **1-2 marks** Some detail relating to one type *There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.* **0 marks** *No attempt made or no response worthy of credit.*						
				Question 9 total	**6**	**0**	**0**	**6**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
11/3	(a)			award (1) for any of following • plates move towards each other • more dense plate forced downwards • more dense plate subducted • mountain ranges form • volcanoes form award (2) for any two linked points e.g. more dense plate subducted causing mountain ranges to form	2			2		
	(b)			cross on any of following boundaries for (1) • South American and African • North American and Eurasian • Pacific and Nazca • North American and African gap forms and magma rises to fill the gap / volcano forms / new igneous rock forms (1)	2			2		
	(c)			earthquake	1			1		
				Question 11/3 total	**5**	**0**	**0**	**5**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	*(a)*			award (1) each for up to **two** of following • similar fossil patterns on different continents • similar rock patterns on different continents • coastlines of continents fit together like a jigsaw he was <u>unable</u> to explain how continents <u>moved</u> / suggested <u>no mechanism for movement</u> (1)	3			3		
	(b)	(i)		plates are moving apart **and** magma rising to fill the gap (1) magma <u>cools</u> to form new igneous rock / ocean floor / ridge / islands (1)	2			2		
		(ii)		rock furthest away from ridge identified as oldest - either left-hand side or right-hand side			1	1		
				Question 4 total	**5**	**0**	**1**	**6**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
10	*(a)*	(i)		respiration and combustion use oxygen and produce carbon dioxide whereas photosynthesis uses carbon dioxide and produces oxygen (1) burning more fossil fuels - increase in combustion deforestation - decrease in photosynthesis (1) <u>more</u> heat energy trapped in the atmosphere results in global warming (1)	3			3		
		(ii)		carbon dioxide (produced by power stations / factories) is trapped (1) award (1) for any of following • stored underground e.g. in old oil fields • turned into liquid or solid • reacted with another chemical accept other sensible answers	2			2		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(b)	(i)		$\frac{30.4}{14}$ and $\frac{69.6}{16}$ (1) 2.17:4.35 simplest ratio 1:2 (1) NO_2 (1) award max (1) if no working shown no ecf possible		3		3	3	
		(ii)		N_2O_4 (2) if incorrect award (1) for $\frac{92}{46}$ no ecf possible from *(b)*(i)		2		2	2	
				Question 10 total	**5**	**5**	**0**	**10**	**5**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
11/3	(a)			(surface of the) Earth cooled / temperature decreased (1) (water vapour) condensed to form rivers/lakes/oceans (1) award (1) each for any two of following (carbon dioxide used in) photosynthesis / plants evolved (carbon dioxide) locked in fossil fuels / rocks / shells dissolved/absorbed in oceans	4			4		
	(b)			nitrogen ⇨ 78% (1) accept 79 / 80 oxygen ⇨ 21% (1) accept 20	2			2		
				Question 11/3 total	**6**	**0**	**0**	**6**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			**Indicative content** amount of water vapour decreased as Earth cooled, water vapour condensed and oceans formed amount of carbon dioxide decreased evolution of green plants, photosynthesis, CO_2 taken in by plants / algae evolution of marine animals / CO_2 locked in limestone / chalk / carbonates rock remains of marine organisms / (land) plants locked into fossil fuels amount of oxygen increased evolution of green plants, photosynthesis, O_2 released by plants **5-6 marks** Good explanation of changes for all three gases *There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.* **3-4 marks** Basic explanation of changes referring to photosynthesis and condensation of water vapour *There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.* **1-2 marks** Simple description of changes in percentage of gases *There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.* **0 marks** No attempt made or no response worthy of credit	6			6		

Question				Marking details		Marks available					
						AO1	AO2	AO3	Total	Maths	Prac
	(b)	(i)		No significant impact on the overall level of carbon dioxide	✓			1	1		
				A significant increase in the level of carbon dioxide							
				A significant decrease in the level of carbon dioxide							
		(ii)		Mean atmospheric temperature decreases	✓			1	1		
				Mean atmospheric temperature increases							
				No effect on the mean atmospheric temperature							
		(iii)		Solar radiation decreases because it is reflected by sulfur dioxide	✓			1	1		
				Solar radiation increases because it is absorbed by carbon dioxide							
				Solar radiation increases because it is absorbed by carbon dioxide and sulfur dioxide							
				Solar radiation decreases because it reacts with sulfur dioxide forming sulfuric acid							
				Question 6 total		**6**	**0**	**3**	**9**	**0**	**0**