

Question number	Answer	Notes	Marks
1 a	C (nitrogen)		1
b	A (argon)		1
c	<b>M1</b> (formula) CuO  <b>M2</b> (colour) black	<b>ACCEPT</b> correct formula as a <b>product</b> of an equation. The equation need not be balanced <b>IGNORE</b> names  <b>IGNORE</b> brown <b>REJECT</b> all other colours	2
d i	C (dilute hydrochloric acid)		1
ii	A (calcium carbonate)		1
iii	in a (gas) syringe / downward delivery in air	<b>ALLOW</b> downward delivery	1
e i	$\text{CO}_2(\mathbf{g}) + \text{Ca}(\text{OH})_2(\mathbf{aq}) \rightarrow \text{CaCO}_3(\mathbf{s}) + \text{H}_2\text{O}(\mathbf{l})$	<b>ACCEPT</b> upper case letters <b>IGNORE</b> words	1
e ii	white precipitate forms / liquid goes milky/cloudy	<b>ACCEPT</b> usual alternatives for precipitate	1

Question number				Answer	Notes	Marks
2	a	(i)	M 1	nitrogen		1
		(ii)	M 1	cross in 2nd box (20)		1
		(iii)	M 1	unreactive		1
			M 2	water		1
	b	(i)	M 1	sulfurous acid / H <sub>2</sub> SO <sub>3</sub>	Accept sulfuric(IV) acid Accept ph spellings If name and formula given, both must be correct	1
		(ii)	M 1	nitrogen oxide(s) / nitrogen dioxide / NO <sub>2</sub> / NO <sub>x</sub>	Ignore nitrogen monoxide / nitrous oxide and other acidic gases, eg carbon dioxide, sulfur trioxide, hydrogen chloride	1

Question number			Answer	Notes	Marks
2	b	(iii)	M 1 iron/steel/metal corrodes/rusts/reacts	Ignore physical process such as erosion/weathering/wearing away/dissolving Ignore burns/burning	2
			M 2 limestone/marble reacts/corrodes/is eaten away NOT just buildings	Ignore rusts or physical process such as erosion/weathering/wearing away/dissolving Ignore burns/burning	
			M 3 plants/trees/vegetation/crops/named example adversely affected in specific way, eg dies/stunted growth/harmed/damaged	Ignore deforestation Ignore leaching minerals	
			M 4 fish/aquatic animals/pond life/marine life/named example affected in specific way, eg dies/stunted growth/harmed/damaged	Ignore references to just animals	
				Accept destroys as an adverse effect for all marks	
				Any two for 1 each	
					<b>Total 8 marks</b>

Question number	Answer	Accept	Reject	Marks
3 (a)	(i)	to allow air / oxygen to enter (the crucible) / to come into contact with the magnesium / solid Ignore references to visual checks of reaction completion	to allow the magnesium to burn / react	1
	(ii)	to make sure that <u>all</u> of the magnesium has reacted	to make sure that the (all) magnesium has reacted  to complete the reaction	1
(b)	mass of crucible (and lid) + MgO — mass of crucible (and lid)  lids must be in both or neither  ignore any references to the table of results on page 8	mass of crucible (and lid) at end — mass of crucible (and lid)		1
(c)	(i)	all points plotted correctly to nearest gridline (subtract 1 mark for each error)  <u>correct</u> straight line of best fit (need not pass through origin) (must be drawn with the aid of a rule)	line as evidence of correct plotting when points cannot be seen	2
	(ii)	anomalous point at (0.26, 0.64) circled		1
	(iii)	csq on candidate's graph Units not needed, ignore incorrect units		1
			<b>Total</b>	<b>8</b>