

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	pH probe/(universal) indicator		1	AO1 5.4.2.4
01.2	hydrochloric acid – 1 sodium hydroxide – 14		1 1	AO1 5.4.2.4
01.3	neutralisation		1	AO3 5.4.2.4
01.4	hydrogen ions hydroxide ions water	one mark for one correct two marks for all correct	2	AO1 5.4.2.4
01.5	hydrochloric acid – chloride nitric acid – nitrate sulfuric acid – sulfate		1 1 1	AO1 5.4.2.2
02.1	reduced loses oxygen		1 1	AO1 5.4.1.3
02.2	$2\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 4\text{Fe} + 3\text{CO}_2$		1	AO2 5.4.1.3
02.3	gold is unreactive so is found as elemental gold in the Earth		1 1	AO1 5.4.1.3
03.1	corrosive irritant environmental hazard		1 1 1	AO1 5.4.2.3

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03.2	18 cm <sup>3</sup>		1	AO3 5.4.2.3
03.3	wear splash-proof goggles/safety glasses wash hands before touching eyes/face		1 1	AO3 5.4.2.3
03.4	leave solution in basin on side	accept place the dish on top of a beaker containing some water	1	AO3 5.4.2.3
04.1	aluminium – electrolysis gold – found as pure metal iron – reduction with carbon		1	AO1 5.4.1.3
04.2	oxygen		1	AO1 5.1.1.1
04.3	carbon carbon dioxide		1 1	AO2 5.4.1.3
04.4	reduced copper loses oxygen <b>or</b> copper gains electrons		1 1	AO1 5.4.1.3
05.1	zinc and copper chloride solution		1	AO2 4.4.1.2
05.2	hydrogen		1	AO1 4.1.2.5
05.3	less vigorously		1	AO1 5.1.2.5

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05.4	lithium chloride + copper		1	AO2 5.4.1.2
05.5	sodium > lithium > zinc > copper	one mark for one correct two marks for two correct three marks for all correct	3	AO2 5.4.1.2
06.1	magnesium sulfate + waster hydrochloric acid, hydrogen potassium, nitrate		1 1 1	AO1 5.4.2.2
06.2	$\text{CaCO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{CO}_2 + \text{H}_2\text{O}$	one mark for reactants one mark for products	2	AO2 5.4.2.2
06.3	sodium sulfate		1	AO2 5.4.2.4
06.4	2 cm <sup>3</sup>		1	AO3 5.4.2.4
07.1	dissolves		1	AO1 5.4.2.3
07.2	top pan balance/mass balance/balance		1	AO1 5.4.2.3
07.3	measuring cylinder (D)		1	AO1 5.4.2.3
07.4	remove excess solid/zinc oxide		1	AO3 5.4.2.3

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07.5	zinc chloride		1	5.4.2.2
07.6	zinc chloride + water	allow error carried forwards from question <b>07.5</b>	1	AO3 5.4.1.2
08.1	(C) > B > D > A	one mark for one correct two marks for all correct	2	AO3 5.4.1.2
08.2	A		1	AO3 5.4.1.2
08.3	C		1	AO3 5.4.1.2
08.4	Na ion is drawn with 1 shell with 8 dots, inside square brackets with a superscript + to the right of the brackets		1	AO2 5.2.1.2
08.5	$2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$	one mark for reactants and products one mark for balancing	2	AO2 5.1.2.5
08.6	sodium is more reactive than calcium sodium forms positive ions/loses electrons more readily than calcium		1 1	AO2 5.4.1.2
09.1	lithium		1	AO2 5.4.1.2
09.2	magnesium oxide		1	AO2 5.4.1.1

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09.3	oxidised magnesium has gained oxygen/lost electrons		1 1	AO1 AO2 5.4.1.1
09.4	magnesium is more reactive than carbon therefore, carbon cannot displace magnesium from magnesium oxide		1 1	AO1 5.4.1.3
10.1	pH probe universal/broad range indicator		1 1	AO1 5.4.2.4
10.2	A		1	AO1 5.4.2.4
10.3	E		1	AO1 5.4.2.4
10.4	B		1	AO2 5.4.2.4
10.5	increases		1	AO2 5.4.2.4