Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1		i	(Form of carbon) X ✓ An electrode needs to conduct electricity ✓	2 (2 x AO 3.2a)	**IGNORE** other properties **Examiner's Comments** The need for an electrode to conduct electricity was well known and many candidates chose X. Those that chose Y or Z gave the reason as not conducting electricity.
		ii	Electrodes need to remain liquid, and not freeze at low temperatures ☐ Electrodes need to remain liquid, and not melt at high temperatures ☐ Electrodes need to remain solid, and not freeze at low temperatures ☐ Electrodes need to remain solid, and not melt at high temperatures ☑ ✓	1 (AO 2.2)	**Examiner's Comments** The high melting point of electrodes was quite well known. All responses were seen.
			Total	**3**	
2			D ✓	1 (AO 1.2)	**Examiner's Comments** The highest achieving candidates appreciated that inert electrodes do not take part in the electrolysis reactions. Many confused the outcome using copper electrodes, hence C was the most popular response.
			Total	**1**	
3			B ✓	1 (AO 2.2)	**Examiner's Comments** Many candidates reversed the products, hence D was a popular incorrect response. However, electrolysis was generally not well understood and so all responses were seen.
			Total	**1**	

4	a		4 ➡ 3 ➡ 1 ➡ 5 ✓✓✓	3 (AO 3 x 3.3a)	4 first ✓ 3 and 1 ✓ 5 last ✓ **Examiner's Comments** Most candidates appreciated that putting on safety goggles was the first step, with higher scoring candidates connecting the battery as the final step. All orders of all responses were seen.
	b	i	12.5 ✓	1 (AO 2.2)	**ALLOW** values between 11.0 and 14.0
		ii	The more copper is formed, the more oxygen is formed / **ORA** ✓	1 (AO 3.1a)	**IGNORE** proportional **Examiner's Comments** Higher achieving candidates successfully described the relationship. There is more copper than iron or there is less oxygen than copper were popular incorrect responses.
	c		Ionic ✓	1 (AO 1.2)	**Examiner's Comments** Covalent was a popular response.
	d		Make sure the electrode is dry / remove the solution from the electrode ✓ Remove the wire/crocodile clip from the electrode ✓	2 (AO 2 x 3.3b)	**ALLOW** leave to dry before weighing **ALLOW** there is water/solution on the electrode **IGNORE** excess **ALLOW** the wire/crocodile clip are on the electrode/scale/balance **ALLOW** take the mass of the wire/clip away from the mass **ALLOW** weigh only the electrode **Examiner's Comments** Many candidates appreciated that the wire and crocodile clip should be removed, often giving these as two separate reasons rather than one. Repeating the process, using better scales, weigh before and after and leave for a longer time were all popular responses. The higher attaining candidates appreciated that the electrode needed to be dried.

			Total	**8**	
5			A ✓	1(AO2.2)	**Examiner's Comments** More successful responses chose elements and the most successful chose response A. B was the most popular incorrect response.
			Total	**1**	
6			B ✓	1(AO2.2)	**Examiner's Comments** Many candidates appreciated that the anode would attract Cl^- with most choosing 'gains an electron'. D was also a popular incorrect response. **OCR support** The Electrolysis Topic exploration pack could be used to develop understanding for this topic by providing extra teacher guidance and a range of activities to use in the classroom.
			Total	**1**	