01. 0620_m15_ms_62 Q: 3

(a) electrolysis (1) [1]

(b) aluminium would react / platinum is inert / less reactive (1) [1]

(c) **(i)** chlorine (1)

(ii) colourless / bleached / pale yellow (1) [2]

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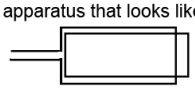
02. 0620_m21_ms_62 Q: 1

Question	Answer	Marks
(a)	an arrow pointing to the bottom of the test tube.	1
(b)	apparatus that looks like a gas syringe in approximately horizontal orientation connected to delivery tube 	1
	graduations shown OR labelled as (gas) syringe	1
(c)	any 2 from: • yellow / green gas • bubbles / effervescence • shiny liquid / metal / solid / deposit / substance max 2	2
(d)	M1 Precaution: use a fume cupboard / well ventilated space	1
	Reason: chlorine is toxic / poisonous M2 must link to M1 to score	1
(e)	(zinc) reacts (with chlorine / silver chloride)	1
(f)	sodium bromide	1
	bromine is displaced by chlorine OR chlorine is more reactive than bromine OR chlorine oxidises bromide	1

03. 0620_s12_ms_63 Q: 6

(a) Bunsen burner (1) **ignore**: switch [1]

(b) labels on correct positions (1) [1]

(c) **(i)** bulb lights/idea of molten lead (1)

(ii) bulb goes out/no fizz (1) [2]

(d) pressure of gas build up/explode owtte (1) [1]

(e) iodine formed (1) **not**: iodide from iodide ions (1) [2]

(f) fume cupboard/well ventilated area (1)
allow gloves if reason specified **ignore**: goggles [1]

[Total: 8]

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04. 0620_s13_ms_63 Q: 2

(a) fizz / bubbles / effervescense (1) [1]

(b) carbon / graphite (1) [1]

(c) electrolysis (1) [1]

(d) **(i)** alkali formed (1) sodium hydroxide formed (2) [2]

(ii) colourless / red (1)

chlorine bleaches / chlorine is an acidic gas / acid produced (1) [2]

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05. 0620_s14_ms_62 Q: 1

(a) beaker (1) [1]

(b) **(i)** electrolysis (1) [1]

(ii) electrodes (1) [1]
allow: conduct electricity / to transfer electrons
ignore: attract ions

(c) hydrogen:

lighted splint (1)

pops (1)

OR

chlorine:

litmus (1)

bleached (1) [2]

(d) diagram to show test-tubes above electrodes (1)

containing liquid (1) [2]

---

06. 0620_s14_ms_63 Q: 3

(a) electroplating (1) [1]
allow: electrolysis

(b) to clean / remove dirt / impurities (1)

so nickel coats evenly / efficiently (1) [2]

(c) aqueous / solution in water(1)

named nickel salt (1) [2]
allow: nickel ions

(d) bulb lights / (silver) deposit on key (1) [1]

(e) rinse with water and suitable method to dry e.g. oven / hairdryer (1) [1]

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07. 0620_s15_ms_61 Q: 2

(a)	bulb lights / silver-grey liquid or solid forms / bubbles;	1	
(b)(i)	carbon / graphite;	1	
(b)(ii)	it reacts / is reactive;	1	**A** corrodes / rusts **I** dissolves
(c)(i)	bromine / Br_2;	1	**R** bromide
(c)(ii)	bleaches / turns white;	1	
(d)	lead;	1	**R** lead(II) / lead ions
(e)	fume cupboard / well-ventilated area;	1	**I** references to goggles / safety clothing

08. 0620_s15_ms_62 Q: 6

(a)	platinum;	1	
(b)	opposites attract / hydrogen ions are positive / cations / H^+;	1	**A** hydrogen is positive **A** hydrogen gains electrons / hydrogen is reduced
(c)(i)	chlorine;	1	
(c)(ii)	(red or blue) litmus; bleached / goes white;	2	**R** other indicators
(d)	gas is soluble / chlorine is soluble / gas dissolves / chlorine dissolves;	1	**I** hydrogen ions from water

09. 0620_w12_ms_61 Q: 2

(a) carbon/graphite/platinum (1) [1]

(b) negative/cathode (1) [1]

(c) bubbles/fizz/ colour of solution pales (1) **not:** gas given off ignore wrong gas [1]

(d) **(i)** with distilled/pure water (1) **accept:** organic solvents [1]

(ii) use of hairdryer/oven (1) **allow:** heat/heater [1]

(e) increase in masses completed correctly (1) [1]

0.75 1.00 1.15 1.15 1.15 accept 1 for 1.00

(f) points plotted correctly (2), –1 any incorrect [3]

two straight lines through points (1)

(g) reaction finished/all copper deposited owtte/all copper sulfate used up (1) [1]

10. 0620_w14_ms_63 Q: 3

(a) carbon / graphite (1) [1]

(b) bulb lights / fizzing / bubbles (1) [1]
ignore: names of electrodes
allow: solution gets paler / changes colour / green colour fades

(c) copper (1)
negative electrode / cathode (1) [2]

(d) electrolysis (1) [1]

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11. 0620_w15_ms_63 Q: 2

(a)	electroplating;	**1**	**R:** electrolysis
(b)	prevent rusting / corrosion / attractive appearance / shiny;	**1**	
(c)	the negative / cathode;	**1**	
(d)	**M1** chromium (salt) / chromium + *any named* anion; **M2** nitrate / sulfate / chloride / ethanoate / *suitable* named anion;	**1** **1**	**M2** is dependent on **M1**
(e)	coating will not stick / be even / dirt or grease will be trapped;	**1**	**I:** it will not conduct
(f)	spoon not completely immersed in electrolyte / only half of spoon will be plated;	**1**	

12. 0620_w16_ms_62 Q: 4

	clean / sandpaper the metal ring dissolve copper(II) sulfate in water / copper(II) sulfate solution set up circuit / switch on electricity / complete circuit copper rod anode(+ve electrode) metal ring cathode(–ve electrode) rotate the metal ring / agitate remove the metal ring, wash and dry	**6**

13. 0620_w20_ms_62 Q: 1

Question	Answer	Marks
(a)	beaker	**1**
(b)(i)	conduct electricity	**1**
	inert	**1**
(b)(ii)	carbon / graphite	**1**
(d)	use a fume cupboard	**1**
	chlorine is toxic	**1**