

## Chemistry 1 – Foundation tier only questions

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
1		(a)			1	copper oxide / (black) solid remains copper oxide / (black) solid stops reacting		an excess blue solution	
		(b)	(i)		1	filter / filtration / filtering			
			(ii)		1	water / H <sub>2</sub> O (ignore incorrect formula if given with correct name)			
		(c)	(i)		1	copper oxide / CuO (ignore incorrect formula if given with correct name)			
			(ii)		1	copper sulfate / CuSO <sub>4</sub> (ignore incorrect formula if given with correct name)		water	

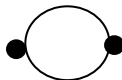
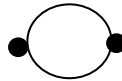
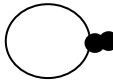
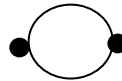
Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
2		(a)			1	oxygen	O <sub>2</sub>	air O	
		(b)			2	sulfur dioxide (1)  carbon (1)	SO <sub>2</sub>  C	SO	
		(c)			3	(wood) burns forming carbon dioxide / combustion produces carbon dioxide (1)  trees take in carbon dioxide/ photosynthesis uses carbon dioxide (1)  3 <sup>rd</sup> marking point can only be awarded when first two are given  carbon dioxide kept in balance (1)	woods / forests / plants   cancels out / remains equal	‘the wood’	

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
3		(a)			2	resists corrosion (1) lasts longer than iron (1) – linked to 1 <sup>st</sup> mark or low density (1) easier to install (1) – linked to 1 <sup>st</sup> mark	less maintenance / weather resistant	iron rusts doesn't rust forms oxide layer	
		(b)	(i)		1	oxide / O <sup>2-</sup>			oxygen O <sub>2</sub> <sup>-</sup>
			(ii)		1	aluminium oxide → aluminium + oxygen	Al <sub>2</sub> O <sub>3</sub> → Al + O <sub>2</sub> (ignore any attempt to balance)	reference to 'molten' aluminium oxide and oxygen 'gas'	
			(iii)		1	liquid / 1			
			(iv)		1	lot / large amount of electricity used lot / large amount of energy used electricity is expensive		a lot of heat needed	

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
4		(a)	(i)		1	sodium and chloride $\text{Na}^+$ and $\text{Cl}^-$			chlorine Na / Cl
			(ii)		1	NaCl	$\text{Na}^+ \text{Cl}^-$		
		(b)			1	too little present / concentration very small / concentration of iodide ions much smaller than that of chloride / it would take a lot of seawater to get a small amount of iodide from it	reference to chlorine / iodine	reference to cost or energy quoting numbers from table	

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
5		(a)	(i)		1	any value in the range 40-100		a range within the range given e.g. 50-90	
			(ii)		1	15	C <sub>15</sub>		
			(iii)		1	range of boiling points / range of numbers of carbon atoms / chain lengths			all fractions have different boiling points
		(b)			1	10 (ignore any number written in box)			
		(c)			1	cracking			

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
6		(a)			1	2.8			2.6
		(b)			1	can agree or disagree with statement – mark awarded for reason  Yes .... as percentage fluoridation increases, the mean DMFT decreases  or  No ..... the mean DMFT decreased most sharply during years when the increase in percentage of children drinking fluoridated water was at its lowest			
		(c)			2	any 2 for (1) each up to 2 max  (may) cause cancer / bone cancer discolours teeth / fluorosis poisonous at high concentration / (may cause) brittle bones / (may cause) IBS / (may cause) thyroid problems mass medication / takes away freedom of choice / unethical can get fluoride from toothpaste / mouthwash			

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
7		(a)	(i)		1	electrolysis			
			(ii)	I	2	all points plotted correctly $\pm \frac{1}{2}$ square (1)  straight line through all points - ruler must be used (1)			
				II	2	straight line (ruler used) from (0,0) to (10,10) (2)  or  straight line from (0,0) and anywhere below hydrogen line (1)			
		(b)			2	<div></div> <div>correct representation of a water molecule (1)</div> <div></div> <div>two water molecules shown (1)</div>	H—O—H		<div></div>
					2	<div></div>			

## Chemistry 1 - Common questions

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
8	1	(a)			2	(silicon difficult to classify) because it has metallic and non-metallic properties (1)  response clearly indicating one or more metallic property and contrasting non-metallic property, e.g. it has a high melting point/boiling point like a metal but is brittle like a non-metal (2)	semi-metal / metalloid		it is a metal and a non-metal
		(b)			1	Mg (ignore atomic number / mass number)		magnesium	
		(c)	(i)		1	2			
			(ii)		1	Ag <sub>2</sub> O	Ag <sup>+</sup> <sub>2</sub> O <sup>2-</sup>		
		(d)	(i)		1	antibacterial / antiviral / antifungal	kills germs / kills bacteria / antiseptic	disinfectant reduces smells	
			(ii)		1	silver nanoparticles can get into drinking water / water supplies / lakes / rivers  could be dangerous to health / harmful / toxic don't know the effect / long term effect not known  <i>uncertainty must be implied</i>		reference to the air / atmosphere / rain pollutes water / the environment	



Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
9	2	(a)			2	melting points decrease (down the group) / decrease but Mg doesn't fit the pattern (1)  boiling points have no trend (1)		boiling points go up and down	
		(b)			2	extremely fast / explosively / even faster than strontium ..... <i>must imply greater than 'very fast'</i> (1)  reactivity increases down Group 2 / reactivity increases down the group / reaction gets quicker down the group (1)		barium lies below strontium / reaction gets stronger down the group	

Question Number									
FT	HT	Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
10	3	(a)	(i)	I	1	to burn / act as fuel / heat the furnace  to form carbon monoxide	to reduce iron ore / iron oxide		
				II	1	remove impurities / sand / silica  react with impurities / sand / silica		to form slag purify the iron	
			(ii)	I	1	$\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$			
				II	1	iron oxide / iron(III) oxide		$\text{Fe}_2\text{O}_3$ iron ore / haematite	Fe
		(b)	(i)		2	<i>basic comment</i> it increases then decreases (1)  <i>higher level comment with use of numerical data</i> it increases to a maximum with 0.8 (% carbon) then decreases / it increases up to 800 (MPa) then decreases (2)			
			(ii)		1	cast iron		3.6	

Question Number			
FT	HT	Mark	Answer
11	4	6 QWC	<p>Indicative content Reference to useful properties of plastics compared with properties of traditional materials</p> <p>Plastic properties: low density, thermal insulator, electrical insulator, waterproof, strong, easily coloured, non-biodegradable (doesn't corrode, erode or rot), cheap, can now be made biodegradable</p> <p>Properties of plastics vs properties of traditional materials for uses, such as: window frames, electrical wire covering, saucepan handles, drain pipes, buckets, carrier bags, bottles etc.</p> <p>5-6 marks The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p>