

Question Number		Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
FT	HT								
7	1	(a)			3	B (1) m pt lower than room temperature/20°C (1) b pt higher than room temperature/20°C (1)	D m pt < 20 (1) A/C/E b pt > 20 (1)	m pt low / b pt high	
		(b)			3	E (1) good conductor of electricity (1) high m pt/b pt (1)	C high m pt/b pt (1) B good conductor (1)		
		(c)			1	malleable / ductile / high density / good conductor of heat / shiny / (generally) hard / sonorous / magnetic	rust / strong	good conductor / heavy / density	

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8	2	(a)	(i)		1	C_8H_{18}		octane	
			(ii)		1	cracking			
		(b)	(i)		1	goes milky/cloudy/white because carbon dioxide is given off			
			(ii)	I	2	(colourless) liquid / water (1) forms when hydrogen burns (1)			
				II	2	no change (1) no carbon dioxide given off because no carbon present in fuel / hydrogen does not burn to give carbon dioxide (1)			

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9	3	(a)	(i)		1	Na_2SO_4			
			(ii)		1	ammonium fluoride ammonium sulfate magnesium fluoride magnesium sulfate - any two for one mark	NH_4F $(\text{NH}_4)_2\text{SO}_4$ MgF_2 MgSO_4		
		(b)			2	B (1) contains the most fluoride (1)		lot of fluoride	fluorine

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10	4	6	<p>Indicative content Many fossil fuels contain impurities including sulfur. The sulfur produces sulfur dioxide during combustion which can eventually produce sulfuric acid resulting in acid rain. Lakes can then become acidic damaging aquatic life. Forests and vegetation gets damaged. Limestone buildings are badly affected. Acid rain also attack metal structures such as bridges.</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>

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FT	HT							
	5	(a)		1	sulfuric	H_2SO_4		
		(b)		2	any 2 of 3 points for (1) each bubbles / fizzing / effervescence (1) blue solution / colour change (1) temperature increases (1)			
		(c)		2	filter (1) evaporate water / evaporate some of solution / evaporate overnight / evaporate in warm place (1)	leave for length of time in warm place		
		(d)		1	copper(II) chloride + water	$\text{CuCl}_2 + \text{H}_2\text{O}$		

Question Number									
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	6	(a)			2	remains of sea / marine organisms / small sea animals / small plants (1) from millions of years ago / under the effect of heat/pressure / no oxygen (1)			
		(b)	(i)		1	evaporated / vaporised	boiled		
			(ii)		1	different boiling points			
		(c)			2	nitrogen (1) it has the lowest boiling point (1) do not award second mark if incorrect gas named			

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	7	(a)	(i)		2	volume of oxygen = $50.0 - 40.5 = 9.5$ (1) percentage of oxygen = $\frac{9.5}{50} \times 100 = 19$ (1) [correct answer only - 2 marks]			
			(ii)		1	not all the oxygen used up / too little copper in the tube / reaction incomplete / air not passed over enough times		leaks / apparatus not fully cooled	
			(iii)		2	remains the same / no change (1) carbon dioxide not used up / produced / does not react with Cu (1)	percentage increases because the volume of air decreases (2)		
		(b)			1	$2 \rightarrow 2 \quad 4$			

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FT	HT	(a)		3	Ba(OH) ₂ (1) Fe ³⁺ (1) HPO ₄ ²⁻ (1)			
	8	(b)		2	sodium loses an electron (1) bromine gains an electron (1)	electrons transferred (1)		

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FT	HT	(a)	(i)	1	cryolite			
	9		(ii)	1	2 4			
		(b)	(i)	2	Pb^{2+} (1) + 2e (1)			
			(ii)	3	<p>any 3 of 4 points for (1) each</p> <p>bromide ions are negative (1)</p> <p>bromide ions attracted to the anode/+ve electrode (1)</p> <p>loss of electrons (1)</p> <p>two bromide ions / bromine atoms form a bromine molecule (1)</p> <p>award credit for above points in suitable equations</p> <p>max (2) if reference to 'bromine ions' or 'bromide atoms'</p>			award 0 if bromide ions are described as positive ions

Question Number		Mark	Answer
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	10	6	<p>Indicative content Temperature very high. Coke is oxidized to carbon monoxide. ($2C + O_2 \rightarrow 2CO$) Carbon monoxide reduced the iron ore to iron. ($3CO + Fe_2O_3 \rightarrow 2Fe + 3CO_2$) Molten iron flows to the bottom of the furnace. Limestone is decomposed by heat to calcium oxide and carbon dioxide. The calcium oxide reacts with the impurities (sand/silica) to form slag which flows to the bottom of the furnace and floats on the molten iron.</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>