Paper 1 (20m)

21	22	23	24	25	26	27	28	29	30
В	В	D	D	С	Α	В	Α	D	Α
31	32	33	34	35	36	37	38	39	40
Α	С	D	С	Α	С	Α	D	С	D

Paper 2 Section A (45m)

1 (a) Fractional distillation 1 (b) To condense the vapour entering the condenser as the distillate 1 (c) S0 °C. It is the boiling point of A which has the lowest boiling point of the 3 substances 1 2 (a) (i) S 1 (ii) Q 1 1 (iii) Q 1 1 (iii) Q 1 1 (iii) Q 1 1 (iv) V and S 1 1 (b) It is fluorine. 1 1 Both have 9 protons, however, 1 1 1 Fe203-loses oxygen to Catbon monoxide, 1 1 Fe203-loses oxygen to Catbon monoxide, 1 1 Fe203-loses oxygen to Catbon monoxide, 1 1 He oxidation state/of Fe decreases from +3 in haematite 10 1 (i) Cate 1 1 1 (b) Molten slag. 1 1 1 (c) (i) Alloys 1 1 (ii) Cate	Qn	Part	Answer	Marks
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			There will be a colour change from purple to green.	

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	(b)	(i) (ii)	Mole of sulfuric acid = $0.02 * 0.2 = 0.004$ mol Mole of sodium hydroxide = $0.004 * 2 = 0.008$ mol	1 1
			Concentration of sodium hydroxide = $0.008 / 0.025$ = 0.32 mol/dm^3	1
		(iii)	Molar mass = conc (g/dm ³) / conc (mol/dm ³) = 12.8 / 0.32 = 40 g/mol	1
			Molar mass of X = 40 – 16 -1 = 23 Therefore, X is sodium.	1
	(c)		onia gas.	1
		The g	as evolved will turn damp red litmus paper blue.	1
5	(a)		bonding	1
	(b)	(i)		1 mark each for correct transfer/ sharing of electrons for both 1 mark for no inner shell electrons for both
		(ii)	Since lithium hydride consist of strong electrostatic forces of attraction between positive and negative ions while ammonia	1
			consists of weak intermolecular forces between ammonia molecules.	1
			And because much more energy is required to overcome the forces of attraction in lithium hydride compared to ammonia, Therefore, lithium hydride has a much higher melting and boiling point, hence it exist as a solid while ammonia exist as a gas under room temperature. (ERC)	1

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6	(a)	A: iron	1
		B: iron(II) nitrate	1
		C: hydrogen gas	1
		D: iron(II) hydroxide	1
		E: iron(III) hydroxide	1
		F: iron(III) chloride	1
	(b)	Test the gas evolved using a burning / lighted splint. It should extinguish	1
		with a pop sound	

4

Section B (20m)

Qn	Part		Answer	Remarks		
7	(a)	(i)	Name 1 element from sodium to argon.	1		
			Since sodium has an electronic configuration of 2.8.1, showing that	1		
			it has 1 valence electron. Therefore, it is in Group I.	1		
				•		
		(ii)	Across Period 3, the metallic character of the element decreases.	1		
			Since the tendency of the elements to form positive ions by losing	1		
			electrons decreases while The tendency increases for elements to gain electrons, forming			
			negative ions as the number of valence electrons increases,	1		
			Therefore, elements show less metallic character across the period.			
	(h)	It is a	oft / con conduct alectricity Thuy density	1		
	(b)		oft / can conduct electricity / low density. react with water to form alkali and hydrogen gas. /	1		
		It can	react with halogens to form halides.	-		
		a- <i>d</i>		1 mark		
		$2Fr (s) + 2H_2O (l) \rightarrow 2FrOH (aq) + H_2 (g) / Fr (s) + Cl_2 (g) \rightarrow 2FrCl_2 (s)$				
	<		+ $Cl_2(g) \Rightarrow 2FrCl_2(s)$	for balanced		
		$\backslash \vee$		chemical		
		$\sum l$		equation		
				1 mark for state		
				symbols		
				-		
8	(a)	(i)	Sulfur gains oxygen to form sulfur dioxide / the oxidation state of	1		
o	(a)	(1)	sulfur increases from 0 to +2.	I		
		(ii)	Mole of sulfur dioxide = 320 / 24 = 13.33 mol	1		
			Mole ratio of SO_2 : S = 1:1 = 13.33:13.33	1		
		/:::>	Mass of sulfur burnt = 13.33 * 32 = 426.6 = 427g sulfur dioxide can react with the water to form sulfurous acid.	1		
		(iii)	Sulfurous acid oxidises in the air to sulfuric acid which forms acid	1		
			rain which can damage buildings made of limestone.	•		

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	(b)	Oxides of nitrogen	1
		Carbon monoxide	1
		Oxides of nitrogen are formed through the reaction of nitrogen and oxygen	1
		under high temperature in the engine.	
		Carbon monoxide is formed through the incomplete combustion of petrol /	1
		fuel in the engine.	
9	(a)	The smaller the particle size, the larger the surface area for reaction to	1
		occur.	
		This increases the frequency of collisions between reactant particles,	1
		resulting in a faster reaction	
	(b)	Add a fixed mass of magnesium strip to hydrochloric acid of	1
		fixed concentration.	
		Collect the volume of hydrogen gas collected using a gas syringe and	1
		measure the volume of hydrogen gas collected at regular time intervals	1
		(eq. 30 seconds)	
		Record the values collected and plot a graph of volume of hydrogen gas	1
		collected against time.	-
		Repeat the experiment using magnesium powder instead of magnesium	1
	<	ribbon. Compare the slopes of the graph obtained for both ribbon and	•
		powder to investigate the rate of reaction.	
		powder to investigate include or reaction.	
	(C)	(i) Exothermid	1
	(0)	(ii) Since magnesium is a more reactive metal than copper,	1
			1
		Therefore it displaces copper from its sulfate to form magnesium	I
		sulfate and copper metal.	

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End of Answer Scheme

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