ASSUMPTION ENGLISH SCHOOL
N Level PRELIMINARY EXAMINATION 2023
SCIENCE (CHEMISTRY)

Paper 3: 20 m

1	2	3	4	5	6	7	8	9	10
B	C	B	B	C	D	C	C	C	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	B	A	C	D	D	D	B	C	A

Paper 4 – Section A: 14 m

1	**(a)**	Ensure smooth boiling.	**[1]**
	(b)	Methanol. It has a lower boiling point and will boil first.	**[1]**
	(c)	Arrangement: Far apart from one another in a disorderly manner. Movement: Moves fast in any direction / moves fast and freely.	**[1]** **[1]**
2	**(a)**	Yellow	**[1]**
	(b)	H^+ (aq) + OH^- (aq) $\rightarrow$ H_2O (*l*)	**[1]**
	(c)	Potassium carbonate or Potassium oxide *Do not accept Potassium metal as it is too reactive.*	**[1]**
3	**(a)**	Alloy (Can accept Steel)	**[1]**
	(b)	The material contains atoms of different sizes, disrupting the orderly arrangement of pure iron. When a force is applied, the layers of atoms do not slide over one another so easily, making it a stronger material. Award 1m for every 2 correct points.	**[1]** **[1]**
	(c)	Element: oxygen Compound: water	**[1]**
4	**(a)**	Test: Place a lighted splint in the path of the gas Observation: Flame extinguishes with a pop sound.	**[1]**
	(b)	<table><tr><th>metal</th><th>letter **P**, **Q**, **R** or **S**</th></tr><tr><td>magnesium</td><td>**S**</td></tr><tr><td>zinc</td><td>**P**</td></tr><tr><td>iron</td><td>**R**</td></tr><tr><td>copper</td><td>**Q**</td></tr></table>*Award 1m for every 2 correct answers.*	**[2]**

Paper 4 – Section B: 16 m

5 (a)

	sodium atom	chlorine atom	hydrogen atom
number of protons	11	17	**1**
number of electrons	**11**	17	**1**
arrangement of electrons	2.8.1	**2, 8, 7**	1

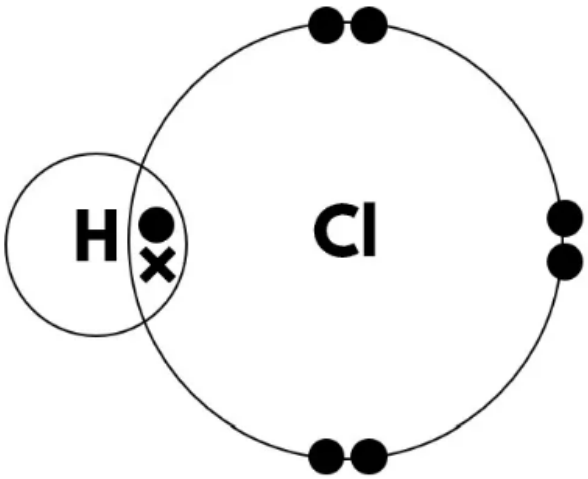
Award 1m for every 2 correct answers **[2]**

(b) Proton: In the nucleus
Electron: On electron shell / outside the nucleus **[1]**

(c) 2 Na (s) + Cl_2 (g) → 2 NaCl (s)
Award 1m for balanced chemical equation and 1m for state symbol **[2]**

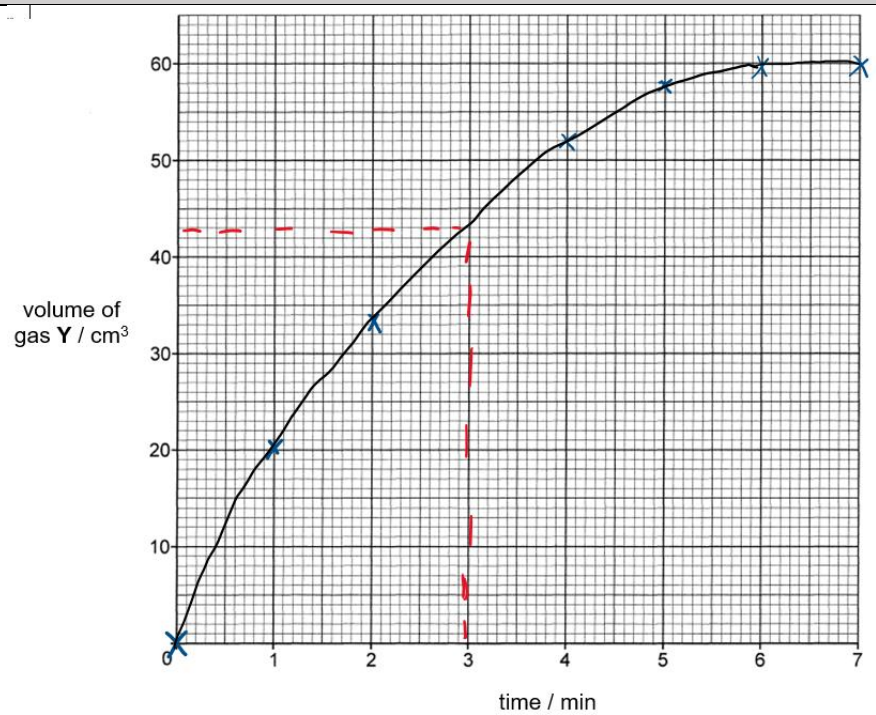
(d) When dissolved in water, <u>mobile ions are available to act as charge carriers</u> to conduct electricity. **[1]**

(e)

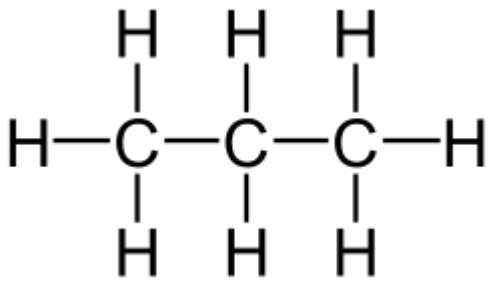


Award 1m for bonding electrons
Award 1m for non-bonding electrons **[2]**

6 (a) (i)



[2]

			Award 1m for correct plotted points (allow for 1 incorrect / missing plotted points)(point for t=3 min should not be plotted, would be considered as incorrect point if plotted) and 1m for smooth curve drawn	
		(ii)	Follow reading on graph	**[1]**
		(iii)	Test: Bubble gas produced in limewater Observation: white ppt formed.	**[1]**
	(b)	**(i)**	No of moles = mass / Mr Mr = mass / no. of moles Mr = 87 / 0.75 = 116	**[1]**
		(ii)	116 – 12 – 3(16) = 56 X is iron	**[1]**
	(c)	Filter the mixture to remove excess metal carbonate. Heat the filtrate till saturated and allow mixture to cool. Wash the crystals with distilled water and dry with filter paper. 5 points – 2 m 3-4 points – 1m		**[2]**
7	**(a)**	**(i)**	Cracking	**[1]**
		(ii)	C_4H_{10}	**[1]**
		(iii)	Fractional Distillation	**[1]**
	(b)	**(i)**	Reddish brown bromine solution turns colourless.	**[1]**
		(ii)	Addition / hydrogenation	**[1]**
		(iii)		**[1]**
		(iv)	$2\ C_3H_6 + 9\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O$ Award 1m for correct formula Award 1m for balanced equation	**[2]**