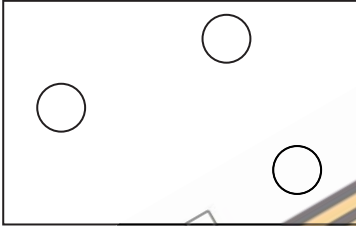



St Gabriel's Secondary School
2018 Preliminary Examination
Sec 4NA Chemistry
Marking Scheme

Paper 3

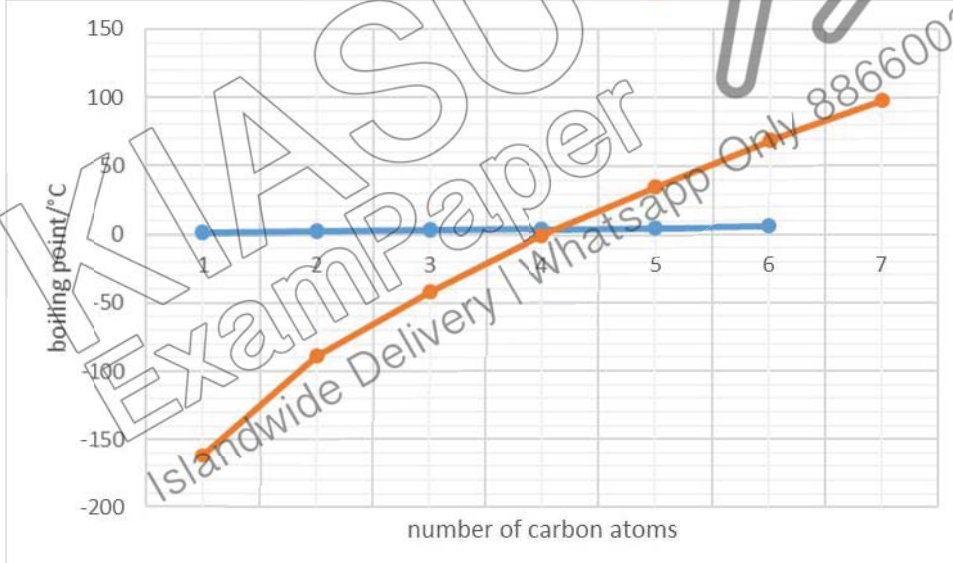
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C	B	B	A	A	B	B	C	C	C	B	A	D	A	B	D	D	B	C	A

Paper 4 Section A

Question	Answers	Mark
1	(a) (i) 70°C (a)(ii) 45 min	[Both correct 1m] [1]
	(b) particles same size far apart disorderly	 [1]
2	(a)(i) Magnesium atom has 2 valence electrons. It will give away 2 valence electrons to obtain a stable octet electronic structure / stable noble gas configuration or a full valence shell of electrons.	[1]
	(ii) Mg ²⁺	[1]
	(b) Dot- and- cross diagram showing all electrons:  Structure of magnesium chloride - dot- and- cross diagram showing all electrons	[1] for Mg ²⁺ [1] for 2 Cl ⁻ ions [2]
	(c) No of mole of Mg = 4.8 / 24 = 0.2 mol [Note: better to show working]	[1]
3	(a)(i) Nitrogen	[1]
	(ii) Oxides of nitrogen or nitrogen oxides	[1]
	(b)(i) Carbon monoxide is produced by the incomplete combustion of petrol in the engine / or when petrol burns incompletely when there is not enough air.	[1]
	(ii) When inhaled, the carbon monoxide would combine with red blood cells/ haemoglobin and form a stable compound that does not take up oxygen. The body tissues/organs are starved of oxygen, and death results.	[1]

4	(a)	Substance X is not safe to be consumed as it contains dye B, which is known to be harmful.	[1]
	(b)	Dye D is insoluble in water.	[1]
	(c)	The <u>dyes would dissolve in the water/solvent</u> and would not move up the chromatography paper. Hence no results will be obtained.	[1]

Paper 4 Section B

5	(a)(i)	'Hydrocarbons' are (organic) compounds that contain carbon and hydrogen only.	[1]
	(ii)	Any 2 of the following: 1. Members have similar chemical properties. 2. Members have physical properties that show a gradual change with increasing molecular mass. Eg mp/bp increase with no of carbon atoms in molecule 3. Each member of the series differs from the next by a $-CH_2$ unit 4. Members have the same functional group 5. Members are all saturated hydrocarbons	[1] each [2]
	(b)(i)	General formula of alkanes: C_nH_{2n+2}	[1]
	(ii)	 <p style="text-align: right;">1m for correct plot 1m for smooth curve/line</p>	[2]
	(iii)	Boiling point: $35^{\circ}C$	[1]
	(iv)	<u>As the number of carbon atoms increases, the boiling point increases.</u> [Explanation (not required): As the size of the alkanes increases, the intermolecular forces of attraction increases, leading to increase in boiling points.]	[1]

7	(a)	Most reactive to least reactive: E, F, G, D	[1]
	(b)	Name of gas: hydrogen Positive test: Lighted splint inserted into mouth of test tube will extinguish with a pop sound.	[1] [1]
	(c)(i)	The <u>different sized atoms in steel disrupt the orderly arrangement of atoms</u> . This makes it <u>difficult for layers of atoms to slide</u> over each other. Thus making steel harder and stronger than pure metal G	[1] [1] [2]
	(ii)	Magnesium is more reactive than iron in steel, thus it corrodes in place of iron, slowing down rusting.	[1] [1] [2]
	(d)	D: copper/silver/gold E: potassium F: Calcium G: Iron	[1] for any one correct

