

PASIR RIS SECONDARY SCHOOL
 2018 Preliminary Examination
 SECONDARY 4 NORMAL ACADEMIC SCIENCE (CHEMISTRY)
 MARKING SCHEME

MCQ

Question	1	2	3	4	5	6	7	8	9	10
Answer	B	A	C	B	D	A	A	C	C	D

Question	11	12	13	14	15	16	17	18	19	20
Answer	C	B	D	D	B	A	D	B	B	A

Section A			
1	(a)	process A: melting process B: boiling / evaporation	[1/2] [1/2]
	(b)	arrangement of particles changes from <u>orderly and very closely packed together</u> to <u>disorderly and close together</u> . movement of particles changes from <u>vibrating in their fixed positions</u> to <u>move freely throughout the liquid volume</u> .	[1] [1]
2	(a)	E	[1]
	(b)	A	[1]
	(c)	D / F	[1]
	(d)	D	[1]
3	(a)	haematite	[1]
	(b)	To remove acidic impurities	[1]
	(c)	product 1: molten slag product 2: molten iron	[1/2] [1/2]
4	(a)	A compound that contains only hydrogen and carbon atoms.	[1]
	(b)	Fractional distillation	[1]
	(c)(i)	Cracking	[1]
	(c)(ii)	$ \begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C} = \text{C} & \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array} $	[1]

Section B											
5	(a)	1	[1]								
	(b)	<table border="1"> <tr> <td>mass number</td> <td>85</td> </tr> <tr> <td>number of protons</td> <td>37</td> </tr> <tr> <td>number of electrons</td> <td>37</td> </tr> <tr> <td>number of neutrons</td> <td>48</td> </tr> </table>	mass number	85	number of protons	37	number of electrons	37	number of neutrons	48	1M awarded for all 3 correct answers
mass number	85										
number of protons	37										
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	(c)	1) soft. 2) low density 3) low melting and boiling point	Any 2 properties. 1M for each property.								
	(d)(i)	$2\text{Rb} + 2\text{H}_2\text{O} \rightarrow 2\text{RbOH} + \text{H}_2$	[1]								
	(d)(ii)		Correct shared pair of electrons [1] Correct electronic structure [1] -1/2 M if legend is missing.								
	(e)	blue / purple	[1]								
6	(a)(i)	$\text{MgCO}_3 + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$	[1]								
	(a)(ii)	test: Bubble the gas into limewater observation: White precipitate formed in limewater	[1] [1]								
	(b)(i)	56 cm ³	[1]								
	(b)(ii)	3.7 minutes / 3.8 minutes	[1]								
	(c)	1) <u>Heat</u> the magnesium chloride solution till <u>saturation</u> . 2) <u>Cool</u> the saturated solution to allow crystals to form. 3) <u>Filter the mixture</u> to collect the crystals formed as the <u>residue</u> . 4) <u>Dry</u> the crystals in between <u>sheets of filter paper</u> .	[1/2] [1/2] [1/2] [1/2]								
	(d)	magnesium / magnesium oxide / magnesium hydroxide	[1]								

7	(a)	$\text{CH}_4 (\text{g}) + 2\text{O}_2 (\text{g}) \rightarrow \text{CO}_2 (\text{g}) + 2\text{H}_2\text{O} (\text{l})$	1M for correct balancing of equation 1M for correct state symbols
	(b)	Number of moles of methane = $320 / 16 = 20$ moles Total energy produced = $20 \times 160 = 3200$ kJ	[1] [1]
	(c)(i)	$\text{C}_n\text{H}_{2n+2}$	[1]
	(c)(ii)	Substitution UV light	[1] [1]
	(c)(iii)	nickel	[1]



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