SKEMA JAWAPAN KERTAS 3
MODUL PERCUBAAN NEGERI KEDAH 2018

<table>
<tr><td>1 (a)</td><td>Suggested answer</td><td>Marks</td></tr>
<tr><td></td><td>All answers are correct with one decimal point.

Experimen I
<table><tr><td>Initial temperature of the solution</td><td>: 28.0 ^{O}C</td></tr><tr><td>Highest temperature of the mixture</td><td>: 63.0 ^{O}C</td></tr></table>
Experimen II
<table><tr><td>Initial temperature of the solution</td><td>: 28.0 ^{O}C</td></tr><tr><td>Highest temperature of the mixture</td><td>: 49.0 ^{O}C</td></tr></table></td><td>3</td></tr>
<tr><td></td><td>One mistake in the reading of apparatus or without one decimal point or without unit</td><td>2</td></tr>
<tr><td></td><td>Two mistakes in the reading of apparatus</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

<table>
<tr><td>1 (b)</td><td>Suggested answer</td><td>Marks</td></tr>
<tr><td></td><td><table><tr><th rowspan="2">Type of metal used // Experiments</th><th colspan="2">Temperature (^{o}C)</th><th rowspan="2">Temperature change (^{o}C)</th></tr><tr><th>Initial // Beginning</th><th>Highest</th></tr><tr><td>Magnesium // I</td><td>28.0</td><td>63.0</td><td>35.0</td></tr><tr><td>Lead // II</td><td>28.0</td><td>49.0</td><td>21.0</td></tr></table></td><td>3</td></tr>
<tr><td></td><td>No units // No temperature change</td><td>2</td></tr>
<tr><td></td><td>[Able to construct a table with at least one title // reading]</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

<table>
<tr><td>1 (c)</td><td colspan="2">Suggested answer</td><td>Marks</td></tr>
<tr><td rowspan="3"></td><td>Manipulated variable :</td><td>Type of metal // Magnesium and Lead</td><td rowspan="3">3</td></tr>
<tr><td>Responding variable :</td><td>The highest temperature // Heat of precipitation</td></tr>
<tr><td>Controlled variable :</td><td>Copper(II) nitrate solution //
Concentration & volume of copper(II) nitrate solution</td></tr>
<tr><td></td><td colspan="2">[Able to state any two variables correctly]</td><td>2</td></tr>
<tr><td></td><td colspan="2">[Able to state any one variable or idea of all variables]</td><td>1</td></tr>
<tr><td></td><td colspan="2">No response or wrong response</td><td>0</td></tr>
</table>

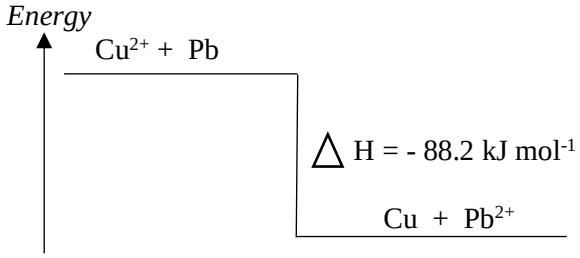
1 (d)	Able to state MV and followed RV with direction correctly	Marks
	Suggested answer When a more electropositive metal is added to copper (II) nitrate solution, the heat of displacement produced is higher. The more electropositive metal, give the higher the heat of displacement when react with copper(II) nitrate solution	3
	Small mistake done by students The heat of displacement of copper is higher when react with magnesium compared to lead	2
	Candidates give the right idea The different type of metal effect the heat of displacement	1
	No response or wrong response	0

1 (e)(i)	Able to state the correct state two observation for this experiment other than temperature changes correctly.	Marks
	Suggested answer 1. A brown solid formed 2. The intensity of blue color of copper(II) nitrate solution turns colourless	3
	[Able to state any one observation correctly or two observations less correctly] 1. The container become hot // blue solution turns paler. 2. The powder dissolve	2
	[Able to state any one observation less correctly]	1
	No response or wrong response	0

1 (e)(ii)	Able to state one corresponding inference correctly.	Marks
	Suggested answer 1. A brown solid formed shows that copper ion has been reduced to copper 2. The blue color of copper(II) nitrate solution turns colourless shows that the solution turns to Magnesium	3
	[Able to state any one corresponding inference less correctly]	2
	[Able to state an idea of the corresponding inference]	1
	No response or wrong response	0

1 (f)	[Able to state the operational definition of heat of displacement correctly] 1. The temperature rise 2. 1 mole copper displace 3. When the metal powder added	Marks
	Suggested answer Heat of displacement is the temperature increase / rise when one mole of copper displaced from copper(II) nitrate solution when other metal / magnesium / lead is added.	3
	State either two of criteria	2
	State either one of criteria	1
	No response or wrong response	0

1.(g)	Answer	Marks
	Answer 1. Heat energy release = 50 X 4.2 X 35 = 7350 J 2. No. of Mole = 1 X 50/1000 = 0.05 mol 3. The heat of displacement = - 147.0 kJ mol^{-1}	3
	[Able to state any two steps correctly]	2
	[Able to state any one steps correctly]	1
	No response or wrong response	0

1.(h)	Answer	Marks
	Answer  1. Able to write energy 2. Able to write equation correctly 3. Able to write the heat of displacement correctly 4. Able to draw the endothermic energy profile correctly	3
	Able to classify state / draw by showing any 3 items correctly	2
	Able to classify state / draw by showing any 2 items correctly	1
	No response or wrong response	0

1(i)	Suggested answer	Marks
	Candidates give the correct value with unit Sample answer [(-102) – (-132) kJ mol^{-1}] = - 117.65 kJ mol^{-1}	3
	Candidates give less correct value without unit // Small mistake done by students = 117.65 kJ / 117.65 / a = no unit a = no –ve sign	2
	Candidates give the right idea • less than [1470 kJ mol^{-1}] // More than [88.2 kJ mol^{-1}]	1
	No response or wrong response	0

1.(j)	Answer	Marks
	Answer Endothermic: Ammonium chloride; Ammonium nitrate Exothermic: Sodium hydroxide; Anhydrous copper(II) sulphate	3
	Able to classify any 3 correctly	2
	[Able to give an idea to classify] Wrong classification Exothermic: Ammonium chloride; Ammonium nitrate Endothermic: Sodium hydroxide; Anhydrous copper(II) sulphate	1
	No response or wrong response	0

Question No.	Rubric	Score
2 (a)	Able to give the statement of the problem accurately. Sample answer: Does vulcanized rubber more elastic than unvulcanised rubber?	3
	Able to give the statement of the problem correctly. Does vulcanized rubber more elastic? // Does unvulcanized rubber less elastic?	2

	Able to give an idea of statement of the problem correctly. - Does vulcanized rubber and unvulcanised rubber have different elasticity? // - Does different types of rubber have different elasticity? // - Are they any differences in elasticity rubber? - To investigate the elasticity of vulcanized rubber and unvulcanised rubber.	1
	No response or wrong response.	0

Question No.	Rubric	Score
2(b)	Able to state the three variables correctly. Manipulated variable : Type of rubber strand // Vulcanised rubber and unvulcanised rubber. Responding variable : The change in the length of the rubber strand // the length of rubber strand // elasticity Constant variable : weight // size / length of rubber strand	3
	Able to state any **two** of the following variables correctly. *Dapat menyatakan mana-mana dua pembolehubah di atas dengan betul.*	2
	Able to state any one of the following variables correctly. *Dapat menyatakan mana-mana satu pembolehubah di atas dengan betul.*	1
	No response or wrong response. *Tiada jawapan atau jawapan salah.*	0

Question No.	Rubric	Score
2(c)	Able to give the hypothesis accurately. Dapat memberikan hipotesis dengan tepat. Sample answer: *Contoh jawapan :* - Vulcanised rubber is more/less elastic than unvulcanised rubber // Unvulcanised rubber is less/more than vulcanized rubber.	3
	Able to give the hypothesis correctly. Sample answer: - Vulcanised rubber able to stretch easily compared to unvulanised rubber.// - Vulcanised rubber is more/less elastic.//	

	- Type of rubber strand is effect the elasticity/length/the change of length.	2
	Able to give an idea of hypothesis correctly. Sample answer: The two types of rubber have different stretchability /hardness / strong. Vulcanization made the rubber more / less stretchable/(any characteristic if rubber)	1
	No response or wrong response.	0

Question No.	Rubric	Score
	Able to state complete material and apparatus. Answer: - Vulcanised rubber - Unvulcanised rubber - Clip - Weigth (10g-100g) - Retort stand - Ruler	3
	Able to state material and apparatus that can conduct experiment. Answer: - Vulcanised rubber - Unvulcanised rubber - Weigth - Ruler	2
	Able to state two material. *Dapat menyatakan dua bahan.* Answer: *Jawapan:* - Vulcanised rubber - *Getah tervulkan* - Unvulcanised rubber - *Getah tak tervulkan*	1
	No response or wrong response.	0

Question No.	Rubric	Score
2 (e)	Able to state a complete procedure. Answer: 1. Hang the vulcanized rubber strip/ (unvulcanised rubber) on retort stand. 2. Measure the initial length.	

<table>
<tr><td></td><td>3. Hang a weight.
4. Measure the length and record.
5. Take off the weight.
6. Measure the length of the rubber strand and record.
7. Repeat the experiment by replace the vulcanized rubber with unvulcanised rubber / (vulcanized rubber).</td><td>3</td></tr>
<tr><td></td><td>Able to state a procedure that can conduct the experiment.

Step 1,5,6 dan 7 // 1,3,4 dan 7</td><td>2</td></tr>
<tr><td></td><td>Able to state a minimum procedure.

Step 1 and 3</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response.</td><td>0</td></tr>
</table>

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<tr><th>Question No.</th><th>Rubric</th><th>Score</th></tr>
<tr><td>2(f)</td><td>Able to make a labelled tabulation of data with suitable unit.

<table>
<tr><td>Type of rubber</td><td>Initial length / cm</td><td>Length of the rubber while the weight is hung / cm</td><td>Length of the rubber when the weight is taken off / cm</td></tr>
<tr><td>Vulcanised rubber</td><td></td><td></td><td></td></tr>
<tr><td>Unvulcanised rubber</td><td></td><td></td><td></td></tr>
</table>
</td><td>2</td></tr>
<tr><td></td><td>Able to make a table not completely without unit.

<table>
<tr><td>Type of rubber</td><td>Initial length</td><td>Length of the rubber when the weight is taken off</td></tr>
<tr><td>Vulcanised rubber</td><td></td><td></td></tr>
<tr><td>Unvulcanised rubber</td><td></td><td></td></tr>
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<tr><td>Type of rubber</td><td>Initial length</td><td>Length of the rubber while the weight is hung</td></tr>
<tr><td>Vulcanised rubber</td><td></td><td></td></tr>
</table>
</td><td>1</td></tr>
</table>

Unvulcanised rubber		

Type of rubber	Length of the rubber while the weight is hung	Length of the rubber when the weight is taken off
Vulcanised rubber		
Unvulcanised rubber		

	No response or wrong response.	0