

PERATURAN PEMARKAHAN KERTAS 3 PERCUBAAN SPM 2011

No. Soalan	Skema pemarkahan :	Markah								
1(a)	<p><b>Able to state all observation correctly</b></p> <p><b>Sample answer</b></p> <table border="1"> <thead> <tr> <th>EXPERIMENT</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>EXPERIMENT I</td> <td>Lead(II) nitrate dissolves // Colourless solution is formed.</td> </tr> <tr> <td>EXPERIMENT II</td> <td>Calcium carbonate does not dissolve/remains unchanged // No change.</td> </tr> <tr> <td>EXPERIMENT III</td> <td>Copper(II) sulphate dissolves// Blue solution is formed.</td> </tr> </tbody> </table>	EXPERIMENT	Observation	EXPERIMENT I	Lead(II) nitrate dissolves // Colourless solution is formed.	EXPERIMENT II	Calcium carbonate does not dissolve/remains unchanged // No change.	EXPERIMENT III	Copper(II) sulphate dissolves// Blue solution is formed.	3
EXPERIMENT	Observation									
EXPERIMENT I	Lead(II) nitrate dissolves // Colourless solution is formed.									
EXPERIMENT II	Calcium carbonate does not dissolve/remains unchanged // No change.									
EXPERIMENT III	Copper(II) sulphate dissolves// Blue solution is formed.									
	Able to state any 2 observations correctly.	2								
	Able to state any 1 observation correctly.	1								
	No response or wrong response	0								
(b)	<p><b>Able to state the operational definition of soluble salt correctly</b></p> <p><b>Sample answer:</b></p> <p>When a salt is added into water and dissolves to form a solution, it is a soluble salt.// When a salt dissolves in water to form a solution, it is a soluble salt.</p>	3								
	<p><b>Able to state the operational definition of soluble salt less correctly</b></p> <p><b>Sample answer</b></p> <p>When a salt is added into water and forms a solution, it is a soluble salt. When a salt dissolves to form a solution, it is a soluble salt. Salt dissolves in water to form a solution.</p>	2								
	<p><b>Able to state any idea of operational definition of soluble salt</b></p> <p>Salt dissolves//Salt dissolves in water. Solution forms.</p>	1								
	No response or wrong response	0								
(c)	<p><b>Able to explain correctly.</b></p> <p>Potassium carbonate solution contains free moving carbonate ions as in sodium carbonate solution.</p>	3								
	<p><b>Able to explain less correctly</b></p> <p>Potassium carbonate solution contains carbonate ions//</p>	2								

	Calcium ion combines with carbonate ion.							
	<p><b>Able to give any idea about formation of insoluble salt</b></p> <p><b>Sample answer</b></p> <p>Calcium carbonate salt is formed// Double decomposition reaction occurs.</p>	1						
	No response or wrong response	0						
(d)	<p><b>Able to classify all the solutions correctly</b></p> <p><b>Sample answer</b></p> <table border="1"> <thead> <tr> <th>Soluble salt</th> <th>Insoluble salt</th> </tr> </thead> <tbody> <tr> <td>Potassium sulphate</td> <td>Lead(II) sulphate</td> </tr> <tr> <td>Zinc sulphate</td> <td>Barium sulphate</td> </tr> </tbody> </table> <p># Score 1 – if state in the reverse</p>	Soluble salt	Insoluble salt	Potassium sulphate	Lead(II) sulphate	Zinc sulphate	Barium sulphate	3
Soluble salt	Insoluble salt							
Potassium sulphate	Lead(II) sulphate							
Zinc sulphate	Barium sulphate							
	<p><b>Able to classify at least 3 salts correctly</b></p>	2						
	<p><b>Able to classify any 2 salts correctly</b></p>	1						
	No response or wrong response	0						

No soalan	Skema pemarkahan	Markah
2(a)	<p><b>[Able to state the inference correctly]</b></p> <p><b>Sample answer:</b></p> <p>Water absorbed heat energy // Exothermic reaction</p>	3
	<p><b>[Able to state the inference]</b></p> <p><b>Sample answer:</b></p> <p>Water temperature increase/rises.// Methanol releases heat.//Mercury expands.</p>	2
	<p><b>[Able to state an idea of inference]</b></p> <p><b>Sample answer:</b></p> <p>Water becomes hot.</p>	1
	No response given or wrong response	0
2(b)	<p><b>[Able to state all variables correctly]</b></p> <p><b>Sample answer:</b></p> <p>Manipulated variable: Types of alcohol Responding variable: Heat of combustion Fixed variable: Volume of water // copper can</p>	3

2(b)	[Able to state any 2 variables correctly]	2
	[Able to state any 1 variable correctly]	1
	[No response given or wrong response]	0
2 (c)	[Able to state the relationship between the manipulated variable and the responding variable with direction correctly] Sample answer: The higher the number of carbon atoms <u>per molecule</u> , the higher the heat of combustion.// When the number of carbon atoms <u>per molecule</u> increases, the heat of combustion increases. Note : RV → MV score 2	3
	[Able to state the relationship between the manipulated variable and the responding variable] Sample answer: The higher the number of carbon atoms, the higher the heat of combustion.	2
	[Able to state an idea of hypothesis] Sample answer: Different alcohols different heat of combustion.// Type of alcohol affects heat of combustion.	1
	[No response given or wrong response]	0
	[Able to state all the mass of alcohols and round off into two decimal places correctly] Sample answer: Methanol = 1.54 Ethanol = 1.20 Propanol = 1.10 Butanol = 1.61	3
2(d)	[Able to state any three the mass of alcohols and round off into two decimal places correctly] [Able to state all the mass of alcohols in four decimal places correctly.]	2
	[Able to state any two the mass of alcohols and round off into two decimal places correctly]	1
	[No response given or wrong response]	0
	2(e)	Able to calculate the heat of combustion of methanol by fulfill the following criteria : (i) Heat absorbed by water (ii) Number of mole (iii) Heat of combustion  Sample answer: Heat absorbed by water = $200 \times 4.2 \times 30$ J // 25200 J Number of mole = $1.54/32$ // 0.048 Heat of combustion = $-25200/0.048$ J mol <sup>-1</sup> // - 525000 J mol <sup>-1</sup> // -525 kJ mol <sup>-1</sup> Note: without unit, score 2
Able to calculate the heat of combustion of methanol by fulfill any two criteria.  Sample answer: Heat absorbed by water = $100 \times 4.2 \times 30$ J // 12600 J ..... X		2
[No response given or wrong response]		0

	Number of mole = $1.54/32$ // 0.048 .....√ Heat of combustion = $-12600/0.048$ J mol <sup>-1</sup> // - 262500 J mol <sup>-1</sup> // -262.5 kJ mol <sup>-1</sup> .....√	
	Able to calculate the heat of combustion of methanol by fulfill any one criteria.  Sample answer: Heat absorbed by water = $100 \times 4.2 \times 30$ J // 12600 J ..... X Number of mole = $1.04/32$ // 0.0325 .....X Heat of combustion = $-12600/0.0325$ J mol <sup>-1</sup> // - 387692 J mol <sup>-1</sup> // -387.692 kJ mol <sup>-1</sup> .....√	1
	[No response given or wrong response]	0
2(f)	Able to plot graph accurately.  Criteria: i. Axis with correct label and unit. ii. Consistent scale iii. Size of graph: at least half of graph paper iv. Transfer all points correctly v. Straight line	3
	Able to plot graph less accurately.  Any four criteria	2
	Able to show minimum requirement of plotting graph  Criteria: i. Axis with correct label / unit. ii. Transfer all points iii. Straight line	1
	[No response given or wrong response]	0
	2(g)	Able to predict the heat of combustion of propanol correctly.  Criteria: i. Dotted line is drawn on the graph. ii. Value based on graph. iii. Negative sign with correct unit.
Able to predict the heat of combustion of propanol incompletely.  Any two criteria		2
Able to give value of the heat of combustion of propanol.  Criteria (i)/(ii)		1
	[No response given or wrong response]	0

3(a)	<b>Able to give the aim of the experiment correctly</b>	2
	<b>Sample answers</b> To investigate the effect of X and Y metals in contact with iron on the rusting of iron. <i>If problem statement is written –skor 1</i>	
	<b>Able to state the aim of the experiment less correctly</b>	1
	<b>Sample answer</b> To investigate the effect of metals X and Y on rusting of iron. To investigate the effect of metals X and Y.	
	<b>No response or wrong response</b>	0
3(b)	<b>Able to state all the three variables correctly</b>	3
	Manipulated variable : 1. Metal X and metal Y//two different metals (one metals is less electropositive and one is more electropositive than iron)//pairs of metal X / iron and Y/iron	
	Responding variable : 1. Rusting of iron//iron rust//the formation of brown solid//formation of blue spot	
	Constant variables: 1. Iron nail//jelly solution//temperature	
	<b>Able to state any two variables correctly</b>	2
<b>Able to state any one variable correctly</b>	1	
	<b>No response or wrong response</b>	0
3(c)	<b>Able to state the relationship between the manipulated variable and the responding variable with direction correctly.</b>	3
	<b>Sample answer</b> 1. When a more electropositive metal is in contact with iron, the metal inhibits rusting. // When a less electropositive metal is in contact with iron, the metal speeds up rusting.	

	<b>*skor 2 –jika rv mendahului mv terbalik</b>	
	<b>Able to state the relationship between the manipulated variable and the responding variable and direction less correctly (no direction)</b>	2
	<b>Sample answer</b> A more electropositive metal will prevent iron from rusting. // A less electropositive metal will cause iron to rust.	
	<b>Able to state an idea of hypothesis</b>	1
	<b>Sample answer:</b> Metal Y/metal X affects rusting(of iron)	
	<b>No response or wrong response</b>	0

No. soalan	Skema pemarkahan	markah
3 (d)	<b>Able to list completely the material/substances and apparatus</b>	3
	<b>Sample answer:</b> <u>Materials/substances and apparatus</u> Two iron nails, Magnesium/zinc/aluminium strip, tin/copper/lead/silver strip Potassium hexacyanoferrate(III) solution + phenolphthalein [Any suitable electrolyte]/[water] Test tube/boiling tube Sand paper  <i>Rujuk g/raja yang berlabel jika tiada dalam senarai : 4 dari senarai bertulis dan 4 dari gambarajah berlabel</i>	
	<b>Able to list basic materials and apparatus</b>	2
	<b>Sample answer:</b> <u>Materials</u> Metal above iron Metal below iron Iron nail Any suitable electrolyte	

	<p><u>Apparatus:</u> any suitable container</p>	
	<p><b>Able to give an idea of the materials and apparatus</b></p> <p><u>Sample answer:</u> Materials iron ,any electrolyte Apparatus: any suitable container</p>	1
	No response or wrong response	0

Question	Mark Scheme	Marks
3 (e)	<p><b>Able to state all the steps correctly</b></p> <p><u>Sample answer:</u></p> <ol style="list-style-type: none"> <li>Clean the iron nails and metals strip with sand paper.</li> <li>Coil iron nails with magnesium ribbon and copper strips.</li> <li>Put/place the coiled iron nail into different test tube.</li> <li>Pour/add/fill the hot jelly solution containing potassium hexacyanoferrate(III)solution and phenolphthalein into the test tube.</li> <li>Leave the test tube in a test tube rack for few days.</li> <li>Record the observation.</li> <li>Steps 1 to 6 are repeated using different metal/Y with iron(if steps 2 does not mention two different test tube).</li> </ol>	3
	<b>Able to state the steps 2,4,and 6 correctly</b>	2
	<p><b>Able to state steps 2 and 4 correctly</b></p> <p>[2 and 4 ]/the idea combining iron and any metals and any substances</p>	1
	No response or wrong response	0

3 (f)	<p><b>Able to present/exhibit a table to record the following items/ information correctly</b></p> <ol style="list-style-type: none"> <li>Heading for the manipulated variables [pair of metals/two different pair of metals]</li> <li>Heading for responding variables</li> <li>3x2 /2x 3 table</li> </ol> <p><u>Sample answer:</u></p> <table border="1"> <thead> <tr> <th>Pair of metals</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Mg/Fe</td> <td></td> </tr> <tr> <td>Cu/Fe</td> <td></td> </tr> </tbody> </table>	Pair of metals	Observation	Mg/Fe		Cu/Fe		3
Pair of metals	Observation							
Mg/Fe								
Cu/Fe								
	<p><b>Able to present/exhibit a table to record the following items/ information correctly</b></p> <ol style="list-style-type: none"> <li>Heading for the manipulated variables</li> <li>Heading for responding variables</li> <li>2x2 table</li> <li>At least one pair of metal</li> </ol> <p><u>Sample answer:</u></p> <table border="1"> <thead> <tr> <th>Set</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Mg/Fe</td> <td></td> </tr> </tbody> </table>	Set	Observation	Mg/Fe		2		
Set	Observation							
Mg/Fe								
	<p><b>Able to give an idea on tabulation of data,at least one information stated in the table</b></p> <ol style="list-style-type: none"> <li>At least one heading</li> <li>2x 2 table</li> </ol> <p><u>Sample answer</u></p> <table border="1"> <thead> <tr> <th>Set</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Set				1		
Set								
	No response or wrong response	0						