

SOALAN 2
QUESTION 2

Soalan Question	Penerangan Description	Markah Mark		Kemahiran Proses Sains Science Process Skill									
		Ceraian Sub-total	Jumlah Total										
2(a)	Dapat menyatakan semua pemerhatian betul. <i>Able to state all the observations correctly.</i> Contoh jawapan / <i>Sample answer:</i>												
	<table border="1"> <thead> <tr> <th>Tabung Uji Test tube</th> <th>Bahan Tindak balas Reactants</th> <th>Pemerhatian Observation</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Larutan kuprum (II) sulfat, CuSO_4 dan jalur zink <i>Copper (II) sulphate, CuSO_4, solution and zinc strip</i></td> <td>Larutan biru menjadi tidak berwarna// Jalur zink melarut// Pepejal perang terenap /terbentuk pada jalur zink. <i>The blue solution turned colourless. // Part of the zinc strip dissolved. // A brown solid was deposited/ formed on zinc strip.</i></td> </tr> <tr> <td>B</td> <td>Larutan kuprum (II) sulfat, CuSO_4 dan pita magnesium <i>Copper (II) sulphate, CuSO_4, solution and magnesium ribbon</i></td> <td>Larutan biru menjadi tidak berwarna// Jalur zink dissolved// Pepejal perang terenap /terbentuk pada jalur pita magnesium <i>The blue solution turned colourless.// Part of the magnesium ribbon dissolved. // A brown solid was deposited on magnesium ribbon.</i></td> </tr> </tbody> </table>	Tabung Uji Test tube	Bahan Tindak balas Reactants	Pemerhatian Observation	A	Larutan kuprum (II) sulfat, CuSO_4 dan jalur zink <i>Copper (II) sulphate, CuSO_4, solution and zinc strip</i>	Larutan biru menjadi tidak berwarna// Jalur zink melarut// Pepejal perang terenap /terbentuk pada jalur zink. <i>The blue solution turned colourless. // Part of the zinc strip dissolved. // A brown solid was deposited/ formed on zinc strip.</i>	B	Larutan kuprum (II) sulfat, CuSO_4 dan pita magnesium <i>Copper (II) sulphate, CuSO_4, solution and magnesium ribbon</i>	Larutan biru menjadi tidak berwarna// Jalur zink dissolved// Pepejal perang terenap /terbentuk pada jalur pita magnesium <i>The blue solution turned colourless.// Part of the magnesium ribbon dissolved. // A brown solid was deposited on magnesium ribbon.</i>	1		Membuat pemerhatian <i>Observing</i>
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		1	2										
2(b)	Dapat menyatakan inferens yang sepadan dengan betul. <i>Able to state inference correctly.</i> Contoh jawapan / <i>Sample answer</i>												
		1	1	Membuat inferens <i>Inferring</i>									

	<p>Pepejal perang terhasil adalah logam kuprum// Ion kuprum (II) diturunkan untuk menghasilkan atom kuprum. <i>Brown solid formed is copper metal// Copper (II) ion is reduced to form copper atom.</i></p>												
2(c)	<p>Dapat mengenalpasti agen penurunan.dengan betul. <i>Able to identify the reducing agent correctly.</i></p> <p>Jawapan / Answer :</p> <p>Magnesium <i>Magnesium</i></p>	1	1	Mentafsir data <i>Interpreting data</i>									
2(d)	<p>Dapat menyatakan suhu awal dan suhu tertinggi bagi set I dan II dengan betul. <i>Able to state the initial and highest temperature for Set I and Set II correctly.</i></p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Set</th> <th>Suhu awal larutan kuprum (II) sulfat, $CuSO_4$ <i>Initial temperature of copper (II) sulphate, $CuSO_4$, solution ($^{\circ}C$)</i></th> <th>Suhu tertinggi campuran bahan tindakbalas <i>Highest temperature of the reacting mixture ($^{\circ}C$)</i></th> </tr> </thead> <tbody> <tr> <td>I</td> <td>27.0</td> <td>36.0</td> </tr> <tr> <td>II</td> <td>27.0</td> <td>48.0</td> </tr> </tbody> </table> <p>* Suhu tertinggi campuran bahan tindakbalas dalam Set II mesti LEBIH TINGGI daripada Set I <i>*The highest temperature of the reacting mixture in Set II MUST be HIGHER than Set I</i></p> <p>* Suhu tanpa 1 titik perpuluhan, diberi 1 markah <i>*Temperature without 1 decimal place, award 1 mark</i></p>	Set	Suhu awal larutan kuprum (II) sulfat, $CuSO_4$ <i>Initial temperature of copper (II) sulphate, $CuSO_4$, solution ($^{\circ}C$)</i>	Suhu tertinggi campuran bahan tindakbalas <i>Highest temperature of the reacting mixture ($^{\circ}C$)</i>	I	27.0	36.0	II	27.0	48.0	1 1	2	Membuat pemerhatian <i>Observing</i>
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2(e)	<p>Dapat menyatakan semua pemboleh ubah dengan betul. <i>Able to state all the variables correctly.</i></p> <p>Contoh jawapan / Sample answer :</p> <p>(i) Pembolehubah dimanipulasikan : Jenis logam // magnesium dan zink <i>Manipulated variable: Type of metal // Magnesium and Zinc</i></p> <p>(ii) Pembolehubah bergerak balas :</p>	1 1 1	3	Mengawal pemboleh ubah <i>Controlling variables</i>									

	<p>Perubahan suhu // Haba tindak balas//Haba Penyesaran</p> <p><i>Responding variable:</i> <i>Temperature change// Heat of Reaction//Heat of Displacement</i></p> <p>(iii) Pembolehubah dimalarkan : Kepekatan dan isipadu larutan kuprum(II) sulfat</p> <p><i>Fixed variable:</i> <i>Concentration and volume of copper(II) sulphate solution</i></p>			
2(f)	<p>Dapat menyatakan hubungan antara pemboleh ubah dimanipulasikan dengan pemboleh ubah bergerak balas dengan betul.</p> <p><i>Able to state the relationship between manipulated variable and responding variable correctly.</i></p> <p>Haba penyesaran antara tindak balas larutan kuprum(II) sulfat dan magnesium lebih tinggi berbanding haba penyesaran tindak balas antara larutan kuprum(II)sulfat dan zink.// Haba penyesaran dalam set I lebih tinggi berbanding haba penyesaran dalam set II</p> <p><i>Heat of displacement between reaction of copper (II) sulphate solution and magnesium is greater/higher than reaction between copper (II) sulphate solution and zinc//</i> <i>Heat of displacement in Set II is greater/higher than heat of displacement in Set I</i></p>	1	1	Membuat hipotesis <i>Hypothesising</i>
2(g)	<p>Dapat menentukan haba Penyesaran bagi Set I dan Set II dengan betul.</p> <p><i>Able to determine the heat of displacement for Set I and Set II correctly.</i></p> <p>Contoh jawapan / <i>Sample answer :</i></p> <p>Bilangan mol larutan kuprum(II) sulfat, CuSO_4 <i>No. of mole copper (II) sulphate solution, CuSO_4</i> $= (0.2 \times 50)/1000$ $= 0.01 \text{ mol}$</p> <p>Perubahan haba, <i>Heat change</i>, $Q = mc\Theta$</p> <p>Set I $Q = 50 \times 4.2 \times 9$ $= 1890\text{J}$ $= 1.89 \text{ kJ}$ $\Delta H = 1.89\text{kJ}/0.01\text{mol} = -189\text{kJmol}^{-1}$</p>	1 1	2	Mentafsir data <i>Interpreting data</i>

	<p>Set II $Q = 50 \times 4.2 \times 21$ $= 4410 \text{ J}$ $= 4.41 \text{ kJ}$ $\Delta H = 4.41 \text{ kJ} / 0.01 \text{ mol} = - 441 \text{ kJ mol}^{-1}$</p> <p>Nilai haba penyesaran bergantung kepada nilai perubahan suhu yang diperolehi oleh calon tetapi nilai haba penyesaran bagi Set II MESTI LEBIH TINGGI daripada Set I. <i>Value heat of displacement depends on the temperature change obtained by the candidate but the heat of displacement for Set II MUST BE HIGHER THAN Set I.</i></p>			
2(h)	<p>Dapat membandingkan haba penyesaran dan menerangkan perbandingan dengan betul. <i>Able to compare the heat of displacement and explain the comparison correctly.</i> Contoh jawapan / <i>Sample answer</i> : P1: Haba penyesaran dalam set II lebih tinggi daripada set I. <i>Heat of displacement in set II is higher than set I.</i> P2: Magnesium lebih elektropositif daripada zink// Zink kurang elektropositif daripada magnesium// Jarak antara kuprum dan magnesium lebih jauh daripada zink dalam Siri elektrolimia <i>Magnesium is more electropositive than zinc// Zinc is less electropositive than magnesium// Distance between magnesium and copper is further between zinc and copper in Electrochemical Series.</i></p>	1 1	2	Mentafsir data <i>Interpreting data</i>
2(i)	<p>Dapat menyatakan definisi secara operasi bagi haba penyesaran dengan kriteria berikut : <i>Able to state the operational definition of heat of displacement with the following criteria :</i></p> <p>(i) Apa yang dilakukan <i>What should be done</i></p> <p>(ii) Apa yang diperhatikan <i>What should be observed</i></p> <p>Contoh jawapan / <i>Sample answer</i> : Apabila logam yang lebih elektropositif ditambah ke dalam larutan garam, suhu campuran bahan tindak balas meningkat menunjukkan haba dibebaskan.</p>	1	1	Mendefinisikan secara operasi <i>Defining operationally</i>



<i>When more electropositive metal is added into salt solution, the temperature of the reacting mixture increases shows that heat is released.</i>			
JUMLAH MARKAH TOTAL MARK	15		