

PERATURAN PERMARKAHAN PEPERIKSAAN PERCUBAAN SPM 2021  
CHEMISTRY KERTAS 1  
KUANTAN

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

21.	C
22.	A
23.	B
24.	D
25.	B
26.	D
27.	D
28.	C
29.	B
30.	A
31.	D
32.	A
33.	C
34.	B
35.	B
36.	A
37.	A
38.	B
39.	D
40.	D

PERATURAN PERMARKAHAN PEPERIKSAAN PERCUBAAN SPM 2021  
CHEMISTRY KERTAS 2  
KUANTAN

Soalan Question			Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
1	(a)	(i)	Kala // <i>Period</i>	1	1
		(ii)	1. Argon//Ar 2. Atom telah mencapai susunan elektron oktet yang stabil//atom Ar tidak menderma, menerima atau berkongsi elektron dengan atom unsur lain <i>Atom has achieved a stable octet electron arrangement// Ar atom do not donate, accept or share electrons with the atoms of other elements.</i>	1 1	2
	(b)		1. Saiz atom Na adalah lebih besar berbanding atom Li 2. Daya tarikan antara nukleus dan valens elektron dalam atom Na lebih lemah berbanding atom Li  <i>1. The atomic size of Na is bigger than Li atom 2. The force of attraction between the nucleus and valence electron of Na atom is weaker than Li atom</i>	1  1  1	2
			<b>JUMLAH</b>		<b>5</b>

Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
2	(a)	1. Silikon dioksida// <i>silicon dioxide</i> 2. Aluminium oksida // <i>aluminium oxide</i>	1 1	1
	(b)	Bahan komposit merupakan bahan yang terdiri daripada gabungan dua atau lebih bahan yang bukan homogen, iaitu bahan matriks dan bahan pengukuhan. <i>Composite materials are materials made from a combination of two or more non-homogeneous substances, namely matrix substance and strengthening substance.</i>	1	1
	(c)	1. Kelebihan: Kekuatan regangan tinggi 2. Kelemahan sifat asal: Lemah// lembut// mudah terbakar// kekuatan regangan rendah  1. <i>Advantage: High stretching strength</i> 2. <i>Weaknesses of original properties: Weak//soft//easily burned// low stretching strength</i>	1 1	2
<b>JUMLAH</b>				<b>5</b>

Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
3	(a)	2.8.2	1	1
	(b)	(i) Atom bagi unsur yang sama yang mempunyai bilangan proton/nombor proton yang sama tetapi bilangan neutron/ nombor nukleon yang berbeza  <i>Atom of the same element with the same number of protons/proton number but different number of neutrons/nucleon number.</i>	1	1
		(ii) S dan T// <i>S and T</i>	1	2
		(iii) Atom S dan atom T mempunyai bilangan proton/nombor proton yang sama tetapi bilangan neutron/ nombor nukleon yang berbeza  <i>Atom S and T have same number of protons/proton number but different number of neutrons/ number.</i>	1	
	(c)	$\frac{(50 \times 79) + (50 \times 81)}{100}$ $= 80$	1  1	2
		<b>JUMLAH</b>		<b>6</b>

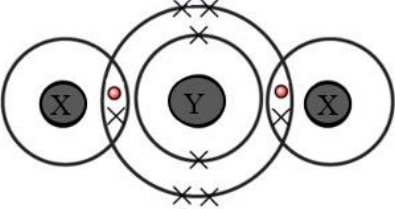
Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks												
4	(a)	Formula kimia yang menunjukkan nisbah paling ringkas bilangan atom bagi setiap unsur dalam suatu sebatian <i>Chemical formula that shows the simplest ratio of atoms of each element in a compound</i>	1	1												
	(b)	Magnesium/ Zink/Aluminium <i>Magnesium/ Zinc /Aluminium</i>	1	1												
	(c)	Untuk memastikan kuprum tidak dioksidakan semula. <i>To ensure the copper is not oxidized again.</i>	1	1												
	(d)	Argentum oksida/ Ferum(II) oksida/ Stanum(II) oksida/ Plumbum(II) oksida/ Ag <sub>2</sub> O/ FeO/ SnO/PbO <i>Argentum oxide/ Iron(II) oxide/ Tin(II) oxide/ Lead(II) oxide/ Ag<sub>2</sub>O/ FeO/ SnO/ PbO</i>	1	1												
	(e)	<p>1. Jisim Cu dan O yang betul dengan unit g. 2. Bilangan mol dan nisbah mol teringkas 3. Formula empirik yang betul</p> <p><i>1. The correct masses of Cu and O with units, g. 2. The number of moles and the simplest mole ratio 3. Correct empirical formula</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Unsur/Element</th> <th>Cu</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>Jisim, g <i>Mass, g</i></td> <td>56.66-53.46 = 3.20</td> <td>57.46 -56.66 = 0.80</td> </tr> <tr> <td>Bil. mol, mol <i>The number of moles, mol</i></td> <td>3.20 ÷ 64 // 0.05</td> <td>0.80 ÷ 16 // 0.05</td> </tr> <tr> <td>Nisbah mol atom teringkas <i>The simplest mole ratio</i></td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Formula empiric/<i>Empirical formula</i> = CuO</p>	Unsur/Element	Cu	O	Jisim, g <i>Mass, g</i>	56.66-53.46 = 3.20	57.46 -56.66 = 0.80	Bil. mol, mol <i>The number of moles, mol</i>	3.20 ÷ 64 // 0.05	0.80 ÷ 16 // 0.05	Nisbah mol atom teringkas <i>The simplest mole ratio</i>	1	1	<p>1</p> <p>1</p> <p>1</p>	3
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Nisbah mol atom teringkas <i>The simplest mole ratio</i>	1	1														
		<b>JUMLAH</b>		<b>7</b>												

Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
5	(a)	Ion nitrat dan ion hidroksida // $\text{NO}_3^-$ dan $\text{OH}^-$ <i>Nitrate ions and hydroxide ions// <math>\text{NO}_3^-</math> and <math>\text{OH}^-</math></i>	1	1
	(b)	(i) Elektrod ferum semakin menipis/kecil// jisim elektrod ferum berkurang  <i>The iron electrode is getting thinner/smaller // the mass of the iron electrode decreases</i>	1	1
		(ii) $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}$	1	1
		(ii) 1. Keamatan warna hijau larutan semakin meningkat/ Warna hijau larutan menjadi semakin gelap. 2. Kepekatan ion ferum(II) bertambah.  <i>1. The intensity of the green colour of the solution increases/ The green colour of the solution becomes darker.</i> <i>2. The concentration of iron(II) ions increases.</i>	1 1	2
	(c)	$\text{Fe}(\text{p}) \mid \text{Fe}^{2+}(\text{ak}) \parallel \text{Ag}^+(\text{ak}) \mid \text{Ag}(\text{p})$  $\text{Fe}(\text{s}) \mid \text{Fe}^{2+}(\text{aq}) \parallel \text{Ag}^+(\text{aq}) \mid \text{Ag}(\text{s})$	1	1
	(d)	(i) Larutan argentum nitrat/ $\text{AgNO}_3$ <i>Argentum nitrate solution/ <math>\text{AgNO}_3</math></i>	1	1
		(ii) Kunci besi di sambung kepada terminal negatif bateri dan kepingan argentum disambung kepada terminal positif bateri  <i>The iron key is connected to the negative terminal of the battery and the argentum strip is connected to the positive terminal of the battery</i>	1	1
<b>JUMLAH</b>				<b>8</b>



Soalan Question	Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
(e)	<p>1. <math>\Delta H</math> dalam set I bernilai positif manakala <math>\Delta H</math> dalam set II bernilai negatif.</p> <p>2. Set I ialah tindak balas endotermik manakala set II ialah tindak balas eksotermik//Tindak balas set I menyerap haba daripada persekitaran manakala tindak balas set II mebebaskan haba ke persekitaran.</p> <p>3. Jumlah kandungan tenaga bagi bahan tindak balas lebih tinggi daripada jumlah kandungan tenaga hasil tindak balas dalam dalam set I manakala jumlah kandungan tenaga bagi bahan tindak balas lebih rendah daripada jumlah kandungan tenaga hasil tindak balas dalam set II.</p> <p>4. Jumlah tenaga haba yang diserap bagi pemutusan ikatan dalam bahan tindak balas lebih tinggi berbanding jumlah tenaga haba yang dibebaskan semasa pembentukan ikatan dalam hasil tindak balas dalam set I manakala jumlah tenaga haba yang diserap bagi pemutusan ikatan dalam bahan tindak balas lebih rendah berbanding jumlah tenaga haba yang dibebaskan semasa pembentukan ikatan dalam hasil tindak balas dalam set II.</p> <p>*Mana-mana dua jawapan.</p> <p>1. <i><math>\Delta H</math> in set I has a positive value while <math>\Delta H</math> in set II has a negative value.</i></p> <p>2. <i>Set I is an endothermic reaction while set II is an exothermic reaction // Set I reaction absorbs heat from the surroundings while a set II reaction releases heat to the surroundings.</i></p> <p>3. <i>The total energy content of the reactants is higher than the total energy content of the products in set I while the total energy content of the reactants is lower than the total energy content of the products in set II.</i></p> <p>4. <i>The total heat energy absorbed for bond breaking in the reactants is higher than the total heat energy released during bond formation in the products in set I while the total heat energy absorbed for bond breaking in the reactants is lower than the total energy heat released during bond formation in the products in set II.</i></p> <p><i>*Any two answers.</i></p>	<p>1</p> <p>1</p>	<p>2</p>
	<b>JUMLAH</b>		<b>9</b>



Soalan Question			Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
7	(a)	(i)	Ikatan kovalen tunggal // <i>Single covalent bond</i>	1	1
		(ii)	<p>1. Bilangan elektron pada setiap petala yang betul dan nukleus ditunjukkan dan dilabelkan <i>The number of electrons on each shell is correct and nucleus is indicated and labeled</i></p> <p>2. Nisbah atom betul dengan bilangan pasangan elektron dikongsi antara setiap atom <i>The ratio of X and Y atoms is correct with the number of electron pairs shared between each atom</i></p> 	1  1	2
		(iii)	$\text{NH}_3 + \text{HCl} \rightarrow \text{NH}_4\text{Cl}$	1	1
		(iv)	<p>Pasangan elektron bebas yang tidak terlibat dalam ikatan kovalen (pada atom nitrogen) di dalam molekul ammonia akan dikongsi dengan ion hidrogen yang tidak mempunyai elektron. <i>The lone pair of electrons that are not involved in covalent bonds (on nitrogen atom) in ammonia molecules will be shared with hydrogen ions that do not have electrons.</i></p>	1	1
	(b)	(i)	<p>Sebatian R: Glukosa/ <math>\text{C}_6\text{H}_{12}\text{O}_6</math> Sebatian S: Plumbum(II) iodida/ <math>\text{PbI}_2</math> Sebatian T: Kalium nitrat/ <math>\text{KNO}_3</math> * Terima mana-mana jawapan yang sesuai <i>Compound R: Glucose/ <math>\text{C}_6\text{H}_{12}\text{O}_6</math> Compound S: Lead(II) iodide/ <math>\text{PbI}_2</math> Compound T: Potassium nitrate/ <math>\text{KNO}_3</math> * Accept any suitable answers</i></p>	1 1 1	3
		(ii)	<p>1. Tambahkan air ke dalam campuran dan kacau <i>Add water into the mixture and stir</i></p> <p>2. Turaskan <i>Filter</i></p>	1  1	2
<b>JUMLAH</b>					<b>10</b>

Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
8	(a)	(i) Garam V: Natrium karbonat//Na <sub>2</sub> CO <sub>3</sub> // Kalium karbonat// K <sub>2</sub> CO <sub>3</sub> // Ammonium karbonat// (NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub> <i>Salt V: Sodium carbonate // Na<sub>2</sub>CO<sub>3</sub>// Potassium carbonate //K<sub>2</sub>CO<sub>3</sub>// Ammonium carbonate // (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub></i>	1	1
		(ii) Pepejal hijau W: Kuprum(II) karbonat <i>Green solid W: Copper(II) carbonate</i>	1	1
		(iii) 1. Formula kimia bahan dan hasil tindak balas betul <i>Correct reactant and products chemical formula</i> 2. Persamaan kimia seimbang <i>Balance chemical equation</i>  Cu(NO <sub>3</sub> ) <sub>2</sub> + Na <sub>2</sub> CO <sub>3</sub> → CuCO <sub>3</sub> + NaNO <sub>3</sub> // Cu(NO <sub>3</sub> ) <sub>2</sub> + K <sub>2</sub> CO <sub>3</sub> → CuCO <sub>3</sub> + KNO <sub>3</sub> // Cu(NO <sub>3</sub> ) <sub>2</sub> + (NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub> → CuCO <sub>3</sub> + NH <sub>4</sub> NO <sub>3</sub>	1  1	2
	(b)	(i) Gas karbon dioksida// <i>carbon dioxide gas</i>	1	1
		(ii) CuO	1	1
	(c)	Biru// <i>blue</i>	1	1
	(d)	1. Masukkan (2-3) cm <sup>3</sup> larutan Z ke dalam tabung uji dan tambah larutan natrium hidroksida /ammonia sehingga berlebihan. <i>Insert (2-3) cm<sup>3</sup> of solution Z into the test tube and add sodium hydroxide/ammonia solution until excess.</i> 2. Mendakan biru tidak larut dalam NaOH berlebihan //mendakan biru larut dalam larutan ammonia berlebihan <i>Blue precipitate insoluble in excess NaOH // Blue precipitate soluble in excess of ammonia solution</i> 3. menunjukkan kehadiran ion kuprum(II) <i>indicates the presence of copper(II) ions</i>	1  1  1	3
<b>JUMLAH</b>				<b>10</b>

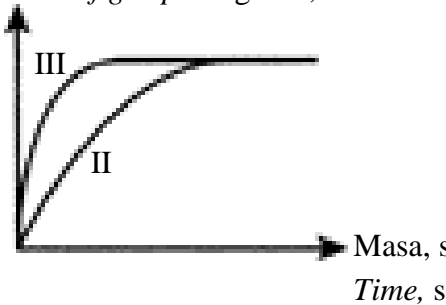
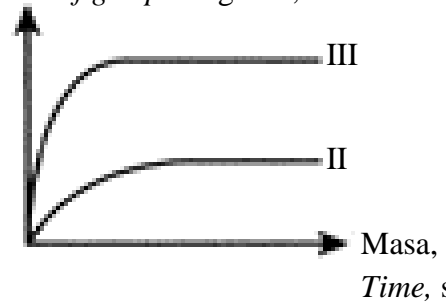


Soalan Question		Peraturan Permarkahan Marking Scheme			Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks	
		4. Peratus atom C mengikut jisim dalam sebatian B lebih tinggi berbanding sebatian A <i>Percentage of C atom by mass in compound B is higher than compound A</i>			1		
(a)	(iii)	1. Hidrokarbon ialah sebatian yang mempunyai atom karbon dan atom hydrogen sahaja. <i>Hydrocarbon is a compound that contains carbon atom and hydrogen atom only.</i>			1	2	
		2. Hidrokarbon tak tepu <i>Unsaturated hydrocarbon</i>			1		
(b)		Sebatian organik <i>Organic compound</i>	(i) Formula molekul <i>Molecular formula</i>	(ii) Siri homolog <i>Homologous series</i>	(iii) Kumpulan berfungsi <i>Functional group</i>	10	
		J	C <sub>4</sub> H <sub>8</sub>	Alkena <i>Alkenes</i>	-		1+1
		K	C <sub>4</sub> H <sub>10</sub>	Alkana <i>Alkanes</i>	-		1+1
		L	C <sub>2</sub> H <sub>5</sub> COOH	Asid karboksilik <i>Carboxylic acids</i>	Kumpulan karboksil// <i>Carboxyl group //</i> -COOH		1+1+1
		M	C <sub>3</sub> H <sub>7</sub> OH	Alkohol <i>Alcohols</i>	Kumpulan hidroksil// <i>Hydroxyl group //</i> -OH		1+1+1
<b>JUMLAH</b>						<b>20</b>	

Soalan Question			Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
10	(a)	(i)	Saponifikasi <i>Saponification</i>	1	1
		(ii)	Kalium hidroksida <i>Potassium hydroxide</i>	1	1
	(b)	(i)	<p>1. Formula kimia bahan dan hasil tindak balas betul <i>Correct reactants and products chemical formula</i></p> <p>2. Persamaan kimia seimbang <i>Balance chemical equation</i></p> <p><math>Mg^{2+} + 2RCOO^- \rightarrow (RCOO)_2Mg //</math> <math>Ca^{2+} + 2RCOO^- \rightarrow (RCOO)_2Ca</math></p> <p>Kesan-kesan pencemaran alam sekitar yang disebabkan oleh detergen: <i>The effects of environmental pollution caused by detergents</i></p> <p>3. Apabila dibuang ke dalam sistem saliran, detergen boleh menyebabkan pertumbuhan alga <i>when dumped into a drainage system, detergent can cause the growth of algae</i></p> <p>4. Ini menghalang cahaya matahari menembusi air <i>This will prevent the sunlight from penetrating the water</i></p> <p>5. Menyebabkan nilai BOD meningkat / kandungan oksigen dalam air berkurang // kematian hidupan akuatik <i>Cause the increase in BOD value/ decrease of oxygen content in water// death of aquatic lives</i></p>	1  1  1  1	5
		(ii)	<p>1. Bahagian hidrofilik anion agen pencuci B/ detergen larut dalam air dan bahagian hidrofobik anion agen pencuci B/ larut dalam gris/kotoran</p> <p>2. Semasa proses gosokan dan pengocakan, gris tertanggal daripada permukaan kain membentuk emulsi/titisan kecil dalam air</p> <p>3. Apabila dibilas, kain menjadi bersih.</p> <p>1. <i>Hydrophilic part of the cleaning agent B/ detergent anion dissolve in water while hydrophobic part of the cleaning agent B/ detergent dissolve in grease</i></p> <p>2. <i>During agitation and scrubbing, the grease pulled away from the cloth and form emulsion/ small droplets in the water</i></p> <p>3. <i>When rinsed, the cloth is cleaned</i></p>	1  1  1	3

Soalan Question		Peraturan Permarkahan Marking Scheme		Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks												
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			<b>JUMLAH</b>		<b>20</b>												

Soalan Question		Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks	
11	(a)	<p>1. Perubahan kuantiti bahan atau hasil tindak balas per unit masa <i>Change in quantity of reactants or products per unit time</i></p> <p>2. Kadar tindak balas purata = <math>22 / (2 \times 60)</math> = <math>0.183 \text{ cm}^3 \text{ s}^{-1}</math></p>	1  1	2	
	(b)	<p>1. Gas hidrogen// <i>hydrogen gas</i></p> <p>2. Bilangan mol <math>\text{HNO}_3 = \frac{0.1 \times 20}{1000}</math> <i>Number of mol HNO<sub>3</sub></i></p> <p>3. Nisbah mol/ <i>mol ratio</i></p> <p>2 mol <math>\text{HNO}_3</math> menghasilkan 1 mol <math>\text{H}_2</math> // 0.002 mol <math>\text{HNO}_3</math> menghasilkan 0.001 mol <math>\text{H}_2</math></p> <p>2 mol <math>\text{HNO}_3</math> produce 1 mol <math>\text{H}_2</math> // 0.002 mol <math>\text{HNO}_3</math> produce 0.001 mol <math>\text{H}_2</math></p> <p>4. Isipadu maksimum gas <math>\text{H}_2</math> <i>Maximum volume of H<sub>2</sub> gas</i> = <math>0.001 \times 24 \text{ dm}^3 // 0.024 \text{ dm}^3 // 24 \text{ cm}^3</math></p>	1  1  1  1	4	
	(c)	(i)	<p>1. Mangkin/ <i>Catalyst</i></p> <p>2. Mangkin memberi laluan alternatif yang merendahkan tenaga pengaktifan dan meningkatkan kadar tindak balas <i>Catalyst provides an alternative path that lowers the activation energy and increase the rate of reaction</i></p> <p>Atau</p> <p>1. Kepekatan asid hidroklorik <i>Concentration of hydrochloric acid</i></p> <p>2. Bilangan ion hidrogen per unit isipadu meningkat <i>The number of hydrogen ions per unit volume increases</i></p>	1  1	2

Soalan Question	Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
	<p>(ii)</p> <ol style="list-style-type: none"> <li>1. Paksi berlabel dengan unit yang betul <i>Labelled axes with correct unit</i></li> <li>2. Lengkung yang betul dengan label <i>Correct curve with label</i></li> </ol> <p>Faktor mangkin/<i>Catalyst factor</i>:</p> <p>Isipadu gas X, cm<sup>3</sup> <i>Volume of gasipadu gas X, cm<sup>3</sup></i></p>  <p>ATAU/ <i>OR</i></p> <p>Faktor kepekatan/ <i>Concentration factor</i>:</p> <p>Isipadu gas X, cm<sup>3</sup> <i>Volume of gasipadu gas X, cm<sup>3</sup></i></p> 	<p>1</p> <p>1</p>	<p>2</p>
(e)	<ol style="list-style-type: none"> <li>1. Merendahkan suhu bilik bedah <i>Lower the temperature of operation room</i></li> <li>2. Aktiviti otak dan organ-organ lain dikurangkan. <i>The activities of the brain and other organs are reduced</i></li> </ol>	<p>1</p> <p>1</p>	<p>2</p>



Soalan Question	Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
(f)	<p>Cadangan jawapan:</p> <ol style="list-style-type: none"> <li>1. Masukkan 100 cm<sup>3</sup> asid hidroklorik 0.1 mol dm<sup>-3</sup> ke dalam kelalang kon.</li> <li>2. Penuhi buret dengan air dan terlangkupkannya ke dalam sebuah besen yang berisi air. Apitkan buret secara menegak.</li> <li>3. Timbang 2.0 g ketulan marmar / kalsium karbonat dan masukkan ke dalam kelalang kon.</li> <li>4. Dengan serta merta, tutup kelalang kon dengan penyumbat getah dan dalam masa yang sama, mulakan jam randik.</li> <li>5. Goyangkan kelalang kon secara perlahan sepanjang eksperimen.</li> <li>6. Catat bacaan buret pada setiap sela masa 30 saat sehingga buret dipenuhi gas.</li> <li>7. Ulang langkah 1-6 dengan menggunakan ketulan marmar/kalsium karbonat bersaiz lebih kecil.</li> </ol> <p>Kesimpulan:</p> <ol style="list-style-type: none"> <li>8. Kadar tindak balas bagi ketulan marmar yang kecil lebih tinggi berbanding ketulan marmar yang lebih besar.</li> </ol> <p>*Jawapan alternatif:</p> <ol style="list-style-type: none"> <li>1. Masukkan 100 cm<sup>3</sup> air suling ke dalam bikar.</li> <li>2. Timbang 2.0 g serbuk natrium klorida dan masukkan ke dalam bikar.</li> <li>3. Dengan serta merta mulakan jam randik.</li> <li>4. Kacau campuran.</li> <li>5. Hentikan jam randik apabila semua serbuk natrium klorida melarut dengan lengkap</li> <li>6. Catat masa yang diambil.</li> <li>7. Ulang langkah 1-6 dengan menggunakan ketulan natrium klorida yg bersaiz lebih besar.</li> </ol> <p>Kesimpulan:</p> <ol style="list-style-type: none"> <li>8. Kadar keterlarutan serbuk natrium klorida dalam air lebih tinggi berbanding ketulan natrium klorida.</li> </ol>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	8

Soalan Question	Peraturan Permarkahan Marking Scheme	Sub Markah Mark Sub	$\Sigma$ Markah $\Sigma$ Marks
	<p><i>Suggested answers:</i></p> <ol style="list-style-type: none"> <li>Put 100 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> hydrochloric acid into a conical flask.</li> <li>Fill the burette fully with water and invert it in a basin of water. Clamp the burette vertically.</li> <li>Weigh 2.0 g of marble / calcium carbonate pieces and place in a conical flask.</li> <li>Immediately, close the conical flask with a rubber stopper and at the same time, start the stopwatch.</li> <li>Swirl the conical flask slowly throughout the experiment.</li> <li>Record the burette reading at every 30 seconds interval until the burette is filled with gas.</li> <li>Repeat steps 1-6 using smaller pieces of marble/calcium carbonate.</li> </ol> <p><i>Conclusion:</i></p> <ol style="list-style-type: none"> <li>The reaction rate for smaller marble pieces is higher than for larger marble pieces.</li> </ol> <p><i>*Alternative answer:</i></p> <ol style="list-style-type: none"> <li>Put 100 cm<sup>3</sup> of distilled water into the beaker.</li> <li>Weigh 2.0 g of sodium chloride powder and put in a beaker.</li> <li>Immediately start the stopwatch.</li> <li>Stir the mixture.</li> <li>Stop the stopwatch when all the sodium chloride powder has completely dissolved</li> <li>Record the time taken.</li> <li>Repeat steps 1-6 using larger lumps of sodium chloride.</li> </ol> <p><i>Conclusion:</i></p> <ol style="list-style-type: none"> <li>The solubility rate of sodium chloride powder in water is higher than that of sodium chloride lumps.</li> </ol>		
	<b>JUMLAH</b>		<b>20</b>

**SKEMA PEMARKAHAN TAMAT  
END OF MARKING SCHEME**