



MODUL PINTAS 2020

TINGKATAN 5

4541/2

CHEMISTRY

Kertas 2

September/Oktober

2½ jam

Dua jam tiga puluh minit

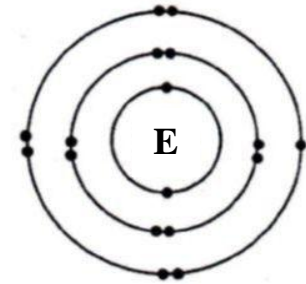
PERATURAN PEMARKAHAN

CHEMISTRY K2

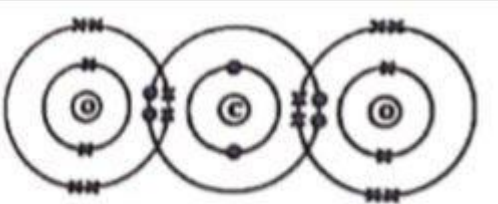
4541/2

Section A
Bahagian A

Question <i>Soalan</i>		Answer <i>Jawapan</i>	Marks <i>Markah</i>
1.	(a)	Saponification <i>Saponifikasi</i>	1
	(b)	Concentrated potassium hydroxide solution <i>Larutan kalium hidroksida pekat</i>	1
	(c)	To reduce the solubility of soap <i>Untuk mengurangkan keterlarutan sabun</i>	1
	(d)	(i) Cleaning agent A <i>Agen pencuci A</i>	1
		(ii) <u>Effectiveness in cleansing action</u> : cleaning agent A is not effective in hard water while cleaning agent B effective in hard water. <i>Keberkesanan tindakan pencucian</i> : <i>Agen pencuci A tidak berkesan dalam air liat manakala Agen pencuci B berkesan dalam air liat.</i> <u>Effect to environment</u> : cleaning agent A is a biodegradable while cleaning agent B is non-biodegradable // cleaning agent A do not cause water pollution while cleaning agent B cause water pollution. <i>Kesan terhadap alam sekitar:</i> <i>Agen pencuci A adalah terbiodegradasi manakala agen pencuci B adalah tidak terbiodegradasi//</i> <i>Agen pencuci A tidak menyebabkan pencemaran air manakala agen pencuci B menyebabkan pencemaran air</i>	1 1
	(e)	(i) Aspirin// Paracetamol/parasetamol	1
		(ii) Q: Antibiotic <i>Antibiotik</i> R: Psychotherapeutic <i>Psikoterapeutik</i>	1 1
		TOTAL / <i>JUMLAH</i>	9

Question Soalan			Answer Jawapan	Marks Markah
2.	(a)	(i)	Nucleon number <i>Nombor nukleon</i>	1
		(ii)	10	1
		(iii)	 <ul style="list-style-type: none"> • Correct number of electrons and shells <i>Bilangan elektron dan petala yang betul</i> • Nucleus <i>Nukleus</i> 	1
	(b)	(i)	80 °C	1
		(ii)	<p>The heat energy absorbed by the particles <i>Tenaga haba diserap oleh zarah-zarah</i></p> <p>is used to overcome the forces of attraction between particles <i>dan digunakan untuk mengatasi daya tarikan antara zarah-zarah</i></p>	1 1
	(c)		<p>1. Potassium manganate(VII) is made up of tiny and discrete particles. <i>Kalium manganat (VII) terdiri daripada zarah-zarah yang halus dan Diskrit</i></p> <p>2. The particles move freely between water molecules <i>Zarah-zarah bergerak bebas di antara molekul-molekul air</i></p> <p>3. from an area of high concentration to an area of low concentration. <i>dari kawasan yang berkepekatan tinggi ke kawasan yang berkepekatan rendah.</i></p>	1 1 1
TOTAL / JUMLAH				9

Question Soalan		Answer Jawapan	Marks Markah
3.	(a)	Empirical formula is a chemical formula that shows the simplest ratio of number of atoms of each element in a compound. <i>Formula empirik adalah formula kimia yang menunjukkan nisbah paling ringkas bagi bilangan atom setiap unsur yang terdapat dalam sebatian.</i>	1
	(b)	ion	1
	(c)	To allow oxygen from the air flow in to react with magnesium. <i>Untuk membenarkan oksigen daripada udara masuk dan bertindak balas dengan magnesium.</i>	1
	(d)	The process of heating, cooling and weighing is repeated until a constant mass is obtained. <i>Proses pemanasan, penyejukan dan penimbangan diulang beberapa kali sehingga jisim tetap diperolehi.</i>	1
	(e)	(i) Magnesium : 27.75 – 25.35 g // 2.4 g <i>Magnesium</i> Oxygen : 29.35 – 27.75 g // 1.6 g <i>Oksigen</i>	1 1
		(ii) Number of mole of magnesium : 2.4 / 24 = 0.1 mol <i>Bilangan mol magnesium</i> Number of mole of oxygen : 1.6 / 16 = 0.1 mol <i>Bilangan mol oksigen</i>	1 1
	(f)	(i) No <i>Tidak</i>	1
		(ii) Lead is less reactive towards oxygen <i>Plumbum kurang reaktif terhadap oksigen</i>	1
		TOTAL / JUMLAH	10

Question Soalan		Answer Jawapan	Marks Markah
4.	(a)	Horizontal rows in periodic table of elements <i>Baris mendatar di dalam jadual berkala unsur</i>	1
	(b)	3	1
	(c)	Amphoteric property : Oxide of X / oksida X <i>Sifat amfoterik</i>	1
		Acidic property : Oxide of Y / oksida Y <i>Sifat berasid</i>	1
	(d) (i)	Covalent compound <i>Sebatian kovalen</i>	1
	(ii)	Correct formula of reactants and products <i>Formula bahan dan hasil yang betul</i>	1
		Balance equation <i>Persamaan seimbang</i>	1
		$C + O_2 \rightarrow CO_2$	
	(iii)	 <p>Carbon dioxide <i>Karbon dioksida</i></p> <ul style="list-style-type: none"> • Correct number of electrons and shells <i>Bilangan elektron dan petala yang betul</i> • nucleus <i>nukleus</i> 	1
	(iv)	Low melting and boiling point// cannot conduct electricity in any state <i>Takat lebur dan takat didih rendah// tidak boleh menghantarkan elektrik dalam mana-mana keadaan</i>	1
TOTAL / JUMLAH			10

Question <i>Soalan</i>		Answer <i>Jawapan</i>	Marks <i>Markah</i>
5.	(a)	To allow the movement of ions and complete the circuit <i>Untuk membenarkan pengaliran ion-ion dan melengkapkan litar</i>	1
	(b)	(i) $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}$	1
		(ii) Green colour of solution turns brown <i>Warna hijau larutan berubah ke perang</i>	1
		(iii) Add sodium hydroxide solution. <i>Tambah larutan natrium hidroksida</i>	1
		Brown precipitate formed. <i>Mendakan perang terbentuk</i>	1
	(c)	(i) Correct formula of reactants and products <i>Formula bahan dan hasil yang betul</i>	1
		Balance equation <i>Persamaan seimbang</i>	1
		$\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6\text{e} \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$	
		(ii) Orange colour of solution turns green. <i>Warna jingga larutan bertukar hijau.</i>	1
		(iii) $2x + 7(-2) = -2$ $x = +6$	1
		(iv) Bromine water//Chlorine water// acidified potassium manganate(VII) solution <i>Air bromin//air klorin//larutan kalium manganat(VII) berasid</i>	1
	(d)	From carbon electrode X to carbon electrode Y through connecting wire <i>Dari elektrod karbon X ke elektrod karbon Y melalui wayar penyambung</i>	1
		TOTAL / JUMLAH	11

Question Soalan		Answer Jawapan	Marks Markah
6.	(a)	Heat released when one mole of silver is displaced from silver nitrate solution by copper <i>Haba yang dibebaskan apabila satu mol argentum disesarkan daripada larutan argentum nitrat oleh kuprum.</i>	1
	(b)	Correct formula of reactants and products <i>Formula bahan dan hasil yang betul</i> Balance equation <i>Persamaan seimbang</i> $\text{Cu} + 2\text{Ag}^+ \rightarrow \text{Cu}^{2+} + 2\text{Ag}$	1 1
	(c)	(i) $50 \times 4.2 \times 6 // 1260 \text{ J}$	1
		(ii) $\frac{(1.0)(50)}{1000} // 0.05 \text{ mol}$	1
		(iii) $-\frac{1260}{0.05} \text{ J mol}^{-1} // 25200 \text{ J mol}^{-1} // -25.2 \text{ kJ mol}^{-1}$	1
	(d)	1. Energy axis correct and two energy level 2. Correct name/formula of reactants and products 3. Label ΔH with value and unit <div style="text-align: center;"> <p>Energy <i>Tenaga</i></p> </div>	1 1 1
	(e)	(i) Heat of displacement of silver by zinc is more than $-25.2 \text{ kJ mol}^{-1}$ <i>Haba penyesaran argentum oleh zink lebih daripada $-25.2 \text{ kJ mol}^{-1}$</i>	1
		(ii) Zinc is more electropositive than copper <i>Zink lebih elektropositif berbanding kuprum</i>	1
		TOTAL / JUMLAH	11

Section B
Bahagian B

Question Soalan		Answer Jawapan			Marks Markah																								
7	(a)	(i)	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 33%;">Compound <i>Sebatian</i></th> <th style="width: 33%;">Hydrocarbon A <i>Hidrokarbon A</i></th> <th style="width: 33%;">Hydrocarbon B <i>Hidrokarbon B</i></th> </tr> </thead> <tbody> <tr> <td>Number of carbon atom <i>Bilangan atom karbon</i></td> <td>3</td> <td>3</td> </tr> <tr> <td colspan="3">Same number of carbon atoms <i>Bilangan atom karbon adalah sama</i></td> </tr> <tr> <td>Number of hydrogen atom <i>Bilangan atom hidrogen</i></td> <td>6</td> <td>8</td> </tr> <tr> <td colspan="3">Number of hydrogen atoms in hydrocarbon B is higher <i>Bilangan atom hidrogen dalam hidrokarbon B lebih tinggi</i></td> </tr> <tr> <td>Type of covalent bond between carbon atom// Type of hydrocarbon <i>Jenis ikatan kovalen antara atom karbon// Jenis hidrokarbon</i></td> <td>Double bond// Unsaturated <i>Ikatan ganda dua// Tak tepu</i></td> <td>Single bond// Saturated <i>Ikatan tunggal// Tepu</i></td> </tr> <tr> <td>Homologous series// IUPAC name Siri homolog// Nama IUPAC</td> <td>Alkene// Propene <i>Alkena// propena</i></td> <td>Alkane// Propane <i>Alkana// propana</i></td> </tr> <tr> <td>General formula/Formula am// Molecular formula/ Formula Molekul</td> <td>C_nH_{2n}// n=2,3,4... C_3H_6</td> <td>C_nH_{2n+2}// n=1,2,3... C_3H_8</td> </tr> </tbody> </table>	Compound <i>Sebatian</i>	Hydrocarbon A <i>Hidrokarbon A</i>	Hydrocarbon B <i>Hidrokarbon B</i>	Number of carbon atom <i>Bilangan atom karbon</i>	3	3	Same number of carbon atoms <i>Bilangan atom karbon adalah sama</i>			Number of hydrogen atom <i>Bilangan atom hidrogen</i>	6	8	Number of hydrogen atoms in hydrocarbon B is higher <i>Bilangan atom hidrogen dalam hidrokarbon B lebih tinggi</i>			Type of covalent bond between carbon atom// Type of hydrocarbon <i>Jenis ikatan kovalen antara atom karbon// Jenis hidrokarbon</i>	Double bond// Unsaturated <i>Ikatan ganda dua// Tak tepu</i>	Single bond// Saturated <i>Ikatan tunggal// Tepu</i>	Homologous series// IUPAC name Siri homolog// Nama IUPAC	Alkene// Propene <i>Alkena// propena</i>	Alkane// Propane <i>Alkana// propana</i>	General formula/Formula am// Molecular formula/ Formula Molekul	C_nH_{2n} // n=2,3,4... C_3H_6	C_nH_{2n+2} // n=1,2,3... C_3H_8	1	Max 4
			Compound <i>Sebatian</i>	Hydrocarbon A <i>Hidrokarbon A</i>	Hydrocarbon B <i>Hidrokarbon B</i>																								
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		(ii)	$C_3H_6 + 9/2 O_2 \rightarrow 3 CO_2 + 3 H_2O$ Correct formula of reactants and products <i>Formula bahan dan hasil yang betul</i> Balance equation <i>Persamaan seimbang</i> Number of mole of $C_3H_6 = \frac{8.4}{42}$ // 0.2 mol <i>Bilangan mol C_3H_6</i>	1	1																								
				1																									

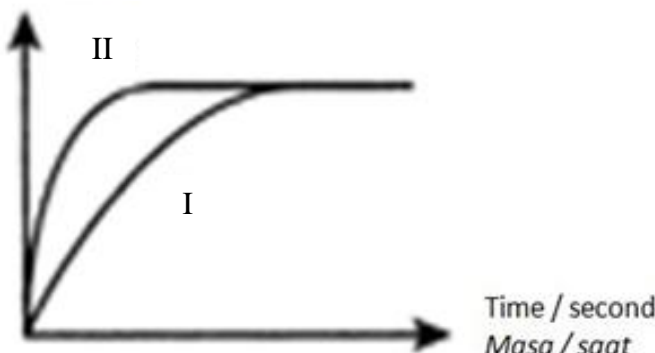
		<p>From chemical equation/ <i>Daripada persamaan kimia</i> 1 mol of C₃H₆ produces 3 mol of CO₂/ <i>1 mol C₃H₆ menghasilkan 3 mol of CO₂</i></p> <p>0.2 mol of C₃H₆ produces 0.6 mol of CO₂ <i>0.2 mol of C₃H₆ menghasilkan 0.6 mol CO₂</i></p> <p>Volume of CO₂ = 0.6 X 24 dm³ // 14.4 dm³ <i>Isipadu CO₂</i></p>	<p>1</p> <p>1</p> <p>1</p>
(b)		<p>Reaction I - Esterification <i>Tindak balas I – Pengesteran</i></p> <p>Homologous series of compound C- Ester <i>Siri Homolog sebatian C</i></p> <p>Structural Formula of compound C <i>Formula struktur sebatian C</i></p> $ \begin{array}{ccccccc} \text{H} & \text{H} & \text{O} & & \text{H} & \text{H} & \text{H} \\ & & & & & & \\ \text{H}-\text{C} & - & \text{C} & - & \text{C} & - & \text{O}-\text{C} & - & \text{C} & - & \text{C} & - & \text{H} \\ & & & & & & & & & & & & \\ \text{H} & & \text{H} & & & & \text{H} & & \text{H} & & \text{H} & & \end{array} $ <p>IUPAC Name of compound C – propyl propanoate <i>Nama IUPAC sebatian C - propil propanoat</i></p> <p>Chemical equation for Reaction I: <i>Persamaan kimia Tindak balas I</i></p> $\text{C}_2\text{H}_5\text{COOH} + \text{C}_3\text{H}_7\text{OH} \rightarrow \text{C}_2\text{H}_5\text{COO C}_3\text{H}_7 + \text{H}_2\text{O}$ <p>Correct formula of reactants and products <i>Formula bahan dan hasil yang betul</i></p> <p>Balance equation <i>Persamaan seimbang</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>

	(c)		Set I	Set II	
			Methanoic acid contains hydrogen ion. <i>Asid metanoik mengandungi ion hidrogen</i>	Ammonia solution contains hydroxide ion. <i>Larutan ammonia mengandungi ion hidroksida</i>	1
			Hydrogen ion neutralise the negative charges at protein membrane <i>Ion hidrogen meneutralkan cas negatif pada membran protein</i>	Hydroxide ion neutralise the hydrogen ion in lactic acid that produced by activities of bacteria <i>Ion hidroksida meneutralkan ion hidrogen dalam asid laktik yang terhasil daripada aktiviti bakteria.</i>	1
			Rubber particles collide with each other causes the protein membrane breaks <i>Polimer getah berlanggar antara satu sama lain menyebabkan membran protein pecah.</i>	Rubber particles repel each other prevents protein membrane break <i>Polimer getah menolak antara satu sama lain menghalang membran protein pecah.</i>	1
			Rubber polymers combine together and coagulate <i>Polimer getah bergabung dan menggumpal.</i>	Rubber polymers cannot combine and coagulate <i>Polimer getah tidak dapat bergabung dan menggumpal</i>	1
			TOTAL / JUMLAH		20

Question Soalan		Answer Jawapan	Marks Markah												
8	(a)	Gas X : oxygen/ <i>oksigen</i> Gas Y : hydrogen/ <i>hidrogen</i>	1 1												
	(b)	<table border="1"> <thead> <tr> <th>Electrode <i>Elektrod</i></th> <th>Cathode <i>Katod</i></th> <th>Anode <i>Anod</i></th> </tr> </thead> <tbody> <tr> <td>Ions attracted to <i>Ion tertarik ke</i></td> <td>H⁺</td> <td>NO₃⁻ , OH⁻</td> </tr> <tr> <td>ions selectively discharged <i>ion yang terpilih untuk dinyahcas</i></td> <td>H⁺</td> <td>OH⁻</td> </tr> <tr> <td>Reason <i>penjelasan</i></td> <td>-</td> <td>Position of OH⁻ ion is lower than NO₃⁻ ion in the electrochemical series. <i>Kedudukan ion OH⁻ lebih rendah daripada ion NO₃⁻ dalam siri elektrokimia.</i></td> </tr> </tbody> </table>	Electrode <i>Elektrod</i>	Cathode <i>Katod</i>	Anode <i>Anod</i>	Ions attracted to <i>Ion tertarik ke</i>	H ⁺	NO ₃ ⁻ , OH ⁻	ions selectively discharged <i>ion yang terpilih untuk dinyahcas</i>	H ⁺	OH ⁻	Reason <i>penjelasan</i>	-	Position of OH ⁻ ion is lower than NO ₃ ⁻ ion in the electrochemical series. <i>Kedudukan ion OH⁻ lebih rendah daripada ion NO₃⁻ dalam siri elektrokimia.</i>	1+1 1+1 1
Electrode <i>Elektrod</i>	Cathode <i>Katod</i>	Anode <i>Anod</i>													
Ions attracted to <i>Ion tertarik ke</i>	H ⁺	NO ₃ ⁻ , OH ⁻													
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	(c) (i)	Example of solution Z : Sodium nitrate solution// sodium sulphate solution// potassium nitrate solution// potassium sulphate solution// Any suitable answer <i>Contoh larutan Z : Larutan natrium nitrat// larutan natrium sulfat//Larutan kalium nitrat// larutan kalium sulfat// Sebarang jawapan yang sesuai</i>	1												
	(ii)	<u>Half equation at cathode/ <i>Persamaan setengah di katod</i> :</u> 2H ⁺ + 2e → H ₂ Correct chemical formula of reactants and product <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> Balanced chemical equation <i>Persamaan kimia seimbang</i>	1 1												

	(d)	(i)	Positive terminal : Copper <i>Terminal positif : Kuprum</i>	1
			Negative terminal : Zinc <i>Terminal negatif : Zink</i>	1
		(ii)	<u>Half equation / Persamaan setengah:</u> Correct chemical formula of reactants and product <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i>	
			Balanced chemical equation <i>Persamaan kimia seimbang</i>	
			Positive terminal : $2\text{H}^+ + 2\text{e} \rightarrow \text{H}_2$ <i>Terminal positif</i>	1+1
			Negative terminal : $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}$ <i>Terminal negatif</i>	1+1
	(e)	(i)	P, Q, R, Cu	1
		(ii)	Negative terminal/ <i>Terminal negatif</i> : R	1
			Voltage value / <i>Nilai voltan</i> = 0.6V	1
			R is more electropositive than Cu // R is above Cu in Electrochemical Series <i>R lebih elektropositif berbanding Cu // R di atas Cu dalam Siri Elektrokimia</i>	1
			TOTAL / JUMLAH	20

		<p>3. A few drops of concentrated sulphuric acid is added slowly <i>Beberapa titis asid sulfurik pekat ditambah secara perlahan-lahan</i></p> <p>4. Brown ring formed shows the presence of nitrate, NO_3^- ion <i>Cincin perang terbentuk menunjukkan kehadiran ion nitrat, NO_3^-</i></p>	<p>1</p> <p>1</p> <p>Max 8</p>
	(c)	<p>Procedure /Prosedur:</p> <p>1. 20 cm³ of 1.0 mol dm⁻³ lead(II) nitrate solution is measured and pour into a beaker. <i>20 cm³ larutan plumbum(II) nitrat 1.0 mol dm⁻³ disukat dan dituang ke dalam sebuah bikar.</i></p> <p>2. 20 cm³ of 1.0 mol dm⁻³ potassium chromate(VI) solution is measured <i>20 cm³ larutan kalium kromat(VI) 1.0 mol dm⁻³ disukat</i></p> <p>3. Potassium chromate(VI) solution is added into the beaker containing lead(II) nitrate solution. <i>Larutan kalium kromat(VI) ditambah ke dalam bikar yang mengandungi larutan plumbum(II) nitrat.</i></p> <p>4. The mixture is stirred with a glass rod. <i>Campuran itu dikacau dengan rod kaca</i></p> <p>5. Filter the mixture to get the yellow precipitate. <i>Turaskan campuran itu untuk mendapatkan mendakan kuning.</i></p> <p>6. Rinse the precipitate with distilled water. <i>Bilas mendakan itu dengan air suling</i></p> <p>7. Dry by pressing between filter papers. <i>Keringkan dengan menekan antara kertas turas.</i></p> <p>Observation/ Pemerhatian : Yellow precipitate is formed <i>Mendakan kuning terbentuk</i></p> <p>Chemical equation /Persamaan kimia : $\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{Pb CrO}_4 + 2\text{KNO}_3$</p> <p>Correct chemical formula of reactants and product <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i></p> <p>Balanced chemical equation <i>Persamaan kimia seimbang</i></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> <p>1</p> <p>1</p>
		TOTAL / JUMLAH	20

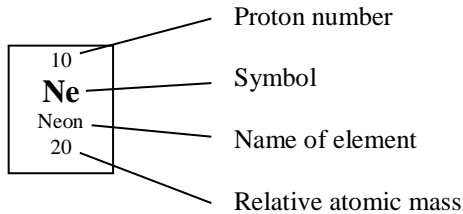
Question Soalan		Answer Jawapan	Marks Markah
10	(a)	<p>The smaller the size of potatoes, the larger the total surface area exposed. <i>Semakin kecil saiz kentang, semakin besar jumlah luas permukaan</i></p> <p>Smaller size of potatoes can absorb heat faster than bigger size of potatoes <i>Kentang bersaiz kecil lebih cepat menyerap haba berbanding kentang bersaiz besar.</i></p>	<p>1</p> <p>1</p>
	(b) (i)	<p>Volume of H₂ gas, cm³ Isi padu gas H₂, cm³</p>  <p>Labelled axes with correct unit <i>Paksi berlabel dan berunit yang betul</i></p> <p>Correct curves with label <i>Lengkung yang betul dan berlabel</i></p> <p>Same maximum volume <i>Isipadu maksimum sama</i></p>	<p>1</p> <p>1</p> <p>1</p>
	(ii)	<p>1. Rate of reaction in Experiment II is higher than I <i>Kadar tindak balas eksperimen II lebih tinggi daripada eksperimen I.</i></p> <p>2. The temperature of reaction in Experiment II is higher than Experiment I <i>Suhu bahan tindak balas dalam eksperimen II lebih tinggi daripada eksperimen I.</i></p> <p>3. The particle of reactant in Experiment II absorbs heat and gains more kinetic energy /that causes they moves faster <i>Zarah-zarah bahan tindak balas dalam eksperimen II menyerap haba dan memperoleh lebih tenaga kinetik/menyebabkan zarah-zarah bergerak lebih laju.</i></p> <p>4. Frequency of collision between zinc atom and H⁺ ion in Experiment II is higher than Experiment I <i>Frekuensi perlanggaran di antara atom zink dan ion H⁺ dalam eksperimen II lebih tinggi daripada eksperimen I.</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

		<p>5. Frequency of effective collision between zinc atom and H^+ ion in Experiment II is higher than Experiment I <i>Frekuensi perlanggaran berkesan di antara atom zink dan ion H^+ dalam eksperimen II lebih tinggi daripada eksperimen I.</i></p>	1
(c)	<p>Materials: Sodium thiosulphate solution 0.2 mol dm^{-3}, sulphuric acid 1.0 mol dm^{-3}, a piece of white paper marked 'X' at the centre. Bahan : <i>Larutan natrium tiosulfat 0.2 mol dm^{-3}, asid sulfurik 1.0 mol dm^{-3}, sekeping kertas putih bertanda 'X' di bahagian tengah</i></p> <p>Apparatus: 150 cm^3 conical flask, stopwatch, 50 cm^3 measuring cylinder, 10 cm^3 measuring cylinder. <i>Kelalang kon 150 cm^3, jam randik, silinder penyukat 50 cm^3, silinder penyukat 10 cm^3.</i></p> <p>Procedure/ Prosedur :</p> <ol style="list-style-type: none"> 1. Measure and pour 50 cm^3 of 0.2 mol dm^{-3} sodium thiosulphate solution into a conical flask. <i>Sukat dan tuang 50 cm^3 larutan natrium tiosulfat 0.2 mol dm^{-3} ke kelalang kon.</i> 2. The conical flask is placed on top of a piece of white paper marked 'X' at the centre. <i>Kelalang kon tersebut diletakkan di atas sekeping kertas putih bertanda 'X' di bahagian tengah</i> 3. 5 cm^3 of 1.0 mol dm^{-3} sulphuric acid is measured using another measuring cylinder. <i>5 cm^3 asid sulfurik 1.0 mol dm^{-3} disukat dengan menggunakan silinder penyukat yang lain.</i> 4. The sulphuric acid is poured immediately and carefully into the conical flask. At the same time, the stop watch is started <i>Asid sulfurik dituang dengan cepat dan cermat. Pada masa yang sama jam randik dimulakan.</i> 5. The mixture in a conical flask is swirled. <i>Campuran dalam kelalang kon digoncang</i> 6. The 'X' mark is observed vertically from the top of the conical flask through the solution. <i>Tanda 'X' diperhatikan secara menegak dari bahagian atas kelalang Kon menerusi larutan.</i> 7. The stopwatch is stopped once the 'X' mark disappears from view. <i>Jam randik diberhentikan sebaik tanda 'X' hilang dari penglihatan</i> 	1 1 1 1 1 1 1	

		<p>8. Step 1 – 7 are repeated using 50 cm³ of sodium thiosulphate solution with different concentration. <i>Langkah 1-7 diulang dengan menggunakan 50 cm³ larutan natrium tiosulfat dengan kepekatan yang berbeza.</i></p> <p>Conclusion/ Kesimpulan : The higher the concentration of sodium thiosulphate solution, the higher, the rate of reaction. <i>Semakin tinggi kepekatan larutan natrium tiosulfat , semakin tinggi kadar tindak balas.</i></p>	<p>1</p> <p>1</p>
		TOTAL / JUMLAH	20

END OF ANSWER PAPER
JAWAPAN TAMAT

																2 He Helium 4			
3 Li Lithium 7		4 Be Beryllium 9												5 B Boron 11	6 C Carbon 12	7 N Nitrogen 14	8 O Oxygen 16	9 F Fluorine 19	10 Ne Neon 20
11 Na Sodium 23		12 Mg Magnesium 24												13 Al Aluminium 27	14 Si Silicon 28	15 P Phosphorus 31	16 S Sulphur 32	17 Cl Chlorine 35	18 Ar Argon 40
19 K Potassium 39	20 Ca Calcium 40	21 Sc Scandium 45	22 Ti Titanium 48	23 V Vanadium 51	24 Cr Chromium 52	25 Mn Manganese 55	26 Fe Iron 56	27 Co Cobalt 59	28 Ni Nickel 59	29 Cu Copper 64	30 Zn Zinc 65	31 Ga Gallium 70	32 Ge Germanium 73	33 As Arsenic 75	34 Se Selenium 79	35 Br Bromine 80	36 Kr Krypton 84		
37 Rb Rubidium 86	38 Sr Strontium 88	39 Y Yttrium 89	40 Zr Zirconium 91	41 Nb Niobium 93	42 Mo Molybdenum 96	43 Tc Technetium 98	44 Ru Ruthenium 101	45 Rh Rhodium 103	46 Pd Palladium 106	47 Ag Silver 108	48 Cd Cadmium 112	49 In Indium 115	50 Sn Tin 119	51 Sb Antimony 122	52 Te Tellurium 128	53 I Iodine 127	54 Xe Xenon 131		
55 Cs Caesium 133	56 Ba Barium 137	57 La Lanthanum 139	72 Hf Hafnium 179	73 Ta Tantalum 181	74 W Tungsten 184	75 Re Rhenium 186	76 Os Osmium 190	77 Ir Iridium 192	78 Pt Platinum 195	79 Au Gold 197	80 Hg Mercury 201	81 Tl Thallium 204	82 Pb Lead 207	83 Bi Bismuth 209	84 Po Polonium 210	85 At Astatine 210	86 Rn Radon 222		
87 Fr Francium 223	88 Ra Radium 226	89 Ac Actinium 227	104 Unq Unnilquadium 257	105 Unp Unnilpentium 260	106 Unh Unnilhexium 263	107 Uns Unnilseptium 262	108 Uno Unniloctium 265	109 Une Unnilennium 266											



58 Ce Cerium 140	59 Pr Praseodymium 141	60 Nd Neodymium 144	61 Pm Promethium 147	62 Sm Samarium 150	63 Eu Europium 152	64 Gd Gadolinium 157	65 Tb Terbium 167	66 Dy Dyprosium 163	67 Ho Holmium 165	68 Er Erbium 167	69 Tm Thulium 169	70 Yb Ytterbium 173	71 Lu Lutetium 175
90 Th Thorium 232	91 Pa Protactinium 231	92 U Uranium 238	93 Np Neptunium 237	94 Pu Plutonium 244	95 Am Americium 243	96 Cm Curium 247	97 Bk Berkelium 247	98 Cf Californium 249	99 Es Einsteinium 254	100 Fm Fermium 253	101 Md Mendelevium 256	102 No Nobelium 254	103 Lr Lawrencium 257