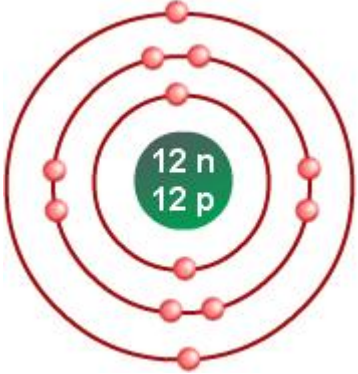


SKEMA JAWAPAN

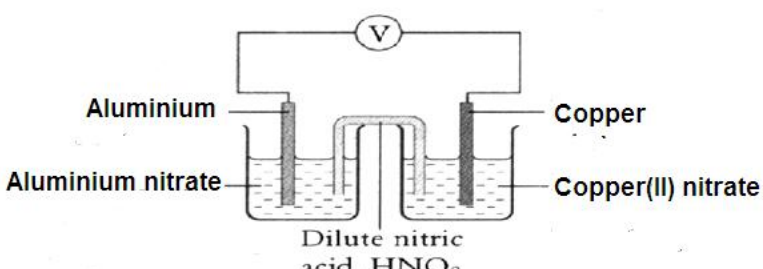
No Soalan			Rubrik	Markah
1	(a)	(i)	1	1
		(ii)		2
	(b)	(i)	<p>Isotop ialah atom-atom unsur yang sama yang mempunyai bilangan proton yang sama tetapi bilangan neutron yang berlainan.</p> <p><i>Isotopes are atoms of same element with the same number of protons but different number of neutrons.</i></p>	1
		(ii)	Kobalt-60 / <i>Cobalt-60</i>	1
			Jumlah/ Total	5
2	(a)	(i)	Zink / <i>Zinc</i>	1
		(ii)	<p>1. Kehadiran atom X / zink mengganggu aturan tersusun atom tembaga <i>The presence of X/ zinc atoms disrupts the orderly arrangements of copper atoms</i></p> <p>2. This reduce the layers of atoms from sliding over one another easily <i>Ini mengurangkan lapisan atom daripada tergelincir antara satu sama lain dengan mudah</i></p>	1 1
		(iii)	Keluli / <i>Steel</i>	1
		iv)	Besi dan Karbon / <i>Iron and Carbon</i>	1
			Jumlah/ Total	5
3	(a)	(i)	<p>Atom bagi unsur X, Y dan Z mempunyai bilangan petala berisi elektron yang sama <i>Atoms of X, Y and Z elements have same number of shells filled with electrons</i></p>	1

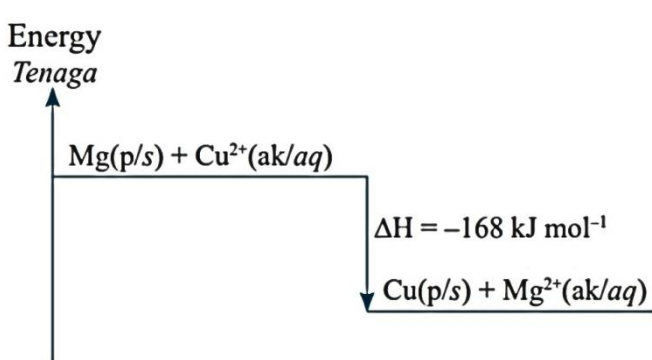
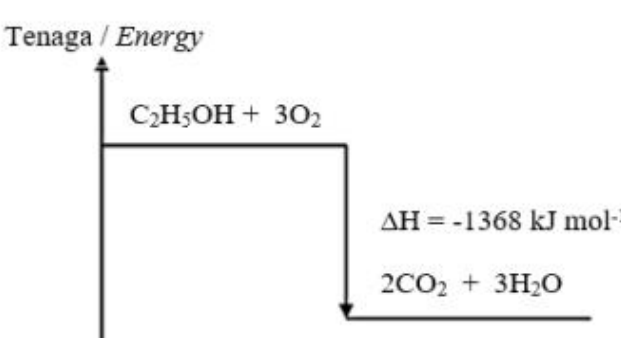
	(b)	(i)	Y	1												
		(ii)	Bilangan proton atom unsur Y lebih banyak daripada X menyebabkan daya tarikan nukleus terhadap elektron di petala lebih kuat dalam atom Y daripada X. Petala ditarik lebih dekat ke arah nucleus dalam atom Y berbanding X. <i>Atom of element Y has more number of protons causing the nuclei attraction forces towards the electrons at the shells becomes stronger at atom of element Y compared to X. The shells are attracted nearer to the nucleus of Y atom compared to X.</i>	1 1												
	(c)	(i)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Nilai pH</th> </tr> <tr> <th colspan="3"><i>pH value</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">/</td> <td></td> <td></td> </tr> </tbody> </table>	Nilai pH			<i>pH value</i>			2	7	13	/			1
Nilai pH																
<i>pH value</i>																
2	7	13														
/																
		(ii)	Z	1												
			Jumlah/ Total	6												
4																
5	(a)		Bahan X /Substance : Ammonia $\text{NH}_4\text{Cl} \longrightarrow \text{NH}_3 + \text{HCl}$	1 1												
	(b)		Larutan ammonia / <i>Ammonia solution</i> Asid Hidroklorik / <i>Hydrochloric acid</i>	1 1												
	(c)		Peneutralan / <i>Neutralisation</i>	1												
	(d)	(i)	NH_4^{+1}	1												
		(ii)	Tambahkan reagen Nessler ke dalam tabung uji yang mengandungi larutan ammonium klorida. <i>Add Nessler reagent into the test tube containing ammonium chloride solution. Mendakan perang terbentuk / Brown precipitate is formed</i>	1 1												
			Jumlah/ Total	8												
6	(a)	(i)	X: air / <i>water</i> Y: propanon kering / <i>propanone</i>	2												
		(ii)	Ammonia mengion dalam air untuk menghasilkan ion OH^- yang bergerak bebas. Ammonia tidak dapat mengion dalam pelarut Y, masih wujud sebagai molekul. <i>Ammonia ionises in water to produce freely moving hydroxide ion, OH^-</i> <i>Ammonia cannot ionises in solvent Y and exist as a molecule.</i>	2												

	(b)	(i)	Larutan yang kepekatannya diketahui dengan tepat.	1
		(ii)	Kelalang volumetrik / <i>Volumetric flask</i>	1
		(iii)	$n = MV / 1000$ $= (0.5 \times 250) / 1000$ $= 0.125 \text{ mol}$ Jisim = Bil mol x Jisim molar $= 0.125 \times (23+16+1)$ $= 5 \text{ g}$	2
		(iv)	Untuk memastikan semua larutan natrium hidroksida dimasukkan ke dalam radas X	1
			Jumlah/ Total	9
7	(a)	(i)	Ialah molekul berantai panjang diperbuat daripada kombinasi berulang unit asas yang dipanggil monomer. <i>Is a long chain molecule that is made up from a combination of many repeating basic unit called monomer.</i>	1
		(ii)	Etena/ <i>ethene</i>	1
		(iii)	Pembakaran beg plastik membebaskan gas beracun menyebabkan pencemaran udara. <i>Burning plastic bag produces poisonous gases which will cause air pollution.</i> Pembuangan beg plastik ke longkang atau sungai menyebabkan longkang tersumbat, banjir kilat dan menyebabkan pencemaran air. <i>Throw plastic bag into drain or river can cause blocked drain, flash flood and water pollution</i> Kaedah mengatasi, ialah kitar semula dan kurangkan penggunaan. <i>Recycled, and reduced uses of plastic bag</i>	2
	(b)	(i)	Sarung tangan/ <i>glove</i> Tapak kasut/ <i>shoe soles</i> Perkakas memasak/ <i>kitchen utensil</i> Komponen automotif/ <i>automotive components</i>	3

		(ii)	Getah ter Vulkan mengandungi rangkaian silang sulphur yang menarik rantai polimer getah balik semula ke susunan asal apabila daya dikenakan. <i>Vulcanised rubber contain sulphur cross-links which pull the polymer chains of rubber back to their original arrangement when forced is applied.</i>	2
			Jumlah/ Total	10
8	(a)	(i)	Kepekatan asid nitrik <i>Concentration of nitric acid</i>	1
		(ii)	$2\text{H}^+ (\text{ak/aq}) + \text{Mg} (\text{p/s}) \rightarrow \text{Mg}^{2+}(\text{ak/aq}) + \text{H}_2(\text{g})$	
	(b)	(i)	Eksperimen I/ <i>Experiment I</i> 60/70 $= 0.86 \text{ cm}^3 \text{ s}^{-1}$ Eksperimen II/ <i>Experiment II</i> 60/135 $= 0.44 \text{ cm}^3 \text{ s}^{-1}$	1 1 1 1
		(ii)	Kadar tindak balas bagi Eksperimen I lebih tinggi daripada Eksperimen II <i>The rate of reaction of Experiment I is higher than Experiment II</i>	1
		(iii)	-Bilangan ion hydrogen per unit isipadu lebih tinggi <i>The number of hydrogen ions per unit volume is higher</i> -Frekuensi perlanggaran antara ion hydrogen dengan atom magnesium lebih tinggi <i>The frequency of collision between hydrogen ions and magnesium atom is higher</i> -Frekuensi perlanggaran berkesan antara zarah-zarah lebih tinggi <i>The frequency of effective collision between particles is higher</i>	1 1 1
	(c)		70s	1
			Jumlah/ Total	10

SKEMA JAWAPAN BAHAGIAN B

No soalan	Rubrik	Markah												
9(a)	<table border="1"> <thead> <tr> <th>Type of cell <i>Jenis sel</i></th> <th>Cell X</th> <th>Cell Y</th> </tr> </thead> <tbody> <tr> <td>Product formed at anode/<i>hasil terbentuk di anod</i></td> <td>P1: Ion Magnesium/ <i>Magnesium ion</i></td> <td>P2: Copper(II) ion/ <i>Ion kuprum(II)</i></td> </tr> <tr> <td>Observation at anode/<i>Pemerhatian di anod</i></td> <td>P3: Magnesium becomes thinner / <i>Magnesium menjadi nipis</i></td> <td>P4: Copper become thinner/<i>kuprum menjadi nipis</i></td> </tr> <tr> <td>Half equation at anode/<i>Setengah persamaan di anod</i></td> <td>P5: $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}$</td> <td>P6: $\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}$</td> </tr> </tbody> </table>	Type of cell <i>Jenis sel</i>	Cell X	Cell Y	Product formed at anode/ <i>hasil terbentuk di anod</i>	P1: Ion Magnesium/ <i>Magnesium ion</i>	P2: Copper(II) ion/ <i>Ion kuprum(II)</i>	Observation at anode/ <i>Pemerhatian di anod</i>	P3: Magnesium becomes thinner / <i>Magnesium menjadi nipis</i>	P4: Copper become thinner/ <i>kuprum menjadi nipis</i>	Half equation at anode/ <i>Setengah persamaan di anod</i>	P5: $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}$	P6: $\text{Cu} \rightarrow \text{Cu}^{2+} + 2\text{e}$	<p>1+1</p> <p>1+1</p> <p>1+1</p>
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(b) i)	 <p>P1: Functional diagram/<i>Gambar rajah berfungsi</i> – 1 P2: Label - 1</p>	1+1												
(b) ii)	<p>1. Write the notation cell 2. Write the ionic equation</p> <p>P1: $\text{Al} \text{Al}^{3+} \text{Cu}^{2+} \text{Cu}$</p> <p>P2: $2\text{Al} + 3\text{Cu}^{2+} \longrightarrow 2\text{Al}^{3+} + 3\text{Cu}$</p>	<p>1</p> <p>1</p>												
(b) iii)	P1: $+0.34 - (-1.66) = +2.00\text{ V}$	1												
(c) i)	<p>P1: To make it more attractive/<i>Untuk menjadikannya lebih menarik</i></p> <p>P2: To make it more resistant to corrosion/<i>Untuk menjadikannya lebih tahan kakisan</i></p>	<p>1</p> <p>1</p>												

		Haba penyesaran = $8.4 \text{ kJ} / 0.05 \text{ mol}$ $= 168 \text{ kJ mol}^{-1}$	1
	(iv)	 <p>Energy Tenaga</p> <p>$\text{Mg(p/s)} + \text{Cu}^{2+}(\text{ak/aq})$</p> <p>$\Delta H = -168 \text{ kJ mol}^{-1}$</p> <p>$\text{Cu(p/s)} + \text{Mg}^{2+}(\text{ak/aq})$</p>	2
(b)	(i)	<p>1. Paksi Y berlabel tenaga <i>Y-axis labelled energy</i></p> <p>2. Dua aras betul dan persamaan kimia <i>Two correct levels with chemical equation</i></p> <p>3. $\Delta H = -1368 \text{ kJ mol}^{-1}$</p>  <p>Tenaga / Energy</p> <p>$\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2$</p> <p>$\Delta H = -1368 \text{ kJ mol}^{-1}$</p> <p>$2\text{CO}_2 + 3\text{H}_2\text{O}$</p> <p>4. Suhu meningkat. <i>Temperature raised</i></p> <p>5. Tindak balas eksotermik // Haba dibebaskan <i>Exothermic reaction // Heat released</i></p>	1 1 1 1 1
	(ii)	<p>Bil. mol propanol / <i>Number of mol of propanol</i> $= 2.16/60 // 0.036 \text{ mol}$</p> <p>Nisbah mol / <i>Mol ratio</i></p>	1 1

		<p>1 mol propanol : 2030000 J</p> <p>0.036 mol propanol : $0.036 \times 2030000 = 73080 \text{ J}$</p> <p>Perubahan suhu / <i>Temperature change</i></p> <p>$\Delta H = mc\theta$,</p> <p>$\theta = 73080 / (200 \times 4.2)$</p> <p>= 87°C</p> <p>p = 3</p> <p>q = 9/2</p>		
			Jumlah	20

SKEMA JAWAPAN BAHAGIAN C

			Markah	Jumlah	
11.	(a)	<p>[Able to state the homologous series of hydrocarbon A correctly] Answer: P1: Alkana // <i>Alkane</i></p> <p>P2:</p> $\begin{array}{cccc} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{C}-\text{H} \\ & & & & \\ & \text{H} & \text{H} & \text{H} & \text{H} \end{array}$ <p>P3: Butana // <i>Butane</i> Atau</p> <p>P2:</p> $\begin{array}{c} & & \text{H} & & \\ & & & & \\ & \text{H} & -\text{C} & -\text{H} & \\ & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C}-\text{H} & \\ & & & & \\ & \text{H} & \text{H} & \text{H} & \end{array}$ <p>P3: 2-metilpropana // <i>2-methylpropane</i></p>	1 1 1	3	
	(b)	(i)	$\text{C}_4\text{H}_{10} + 13/2 \text{O}_2 \rightarrow 4\text{CO}_2 + 5\text{H}_2\text{O}$	1+1	2
		(ii)	<p>Bilangan mol C_4H_{10} = $29\text{g} / (12 \times 4) + (1 \times 10) = 0.5 \text{ mol}$ <i>[menghitung mol dengan unit]</i></p> <p>1 mol C_4H_{10} : 4 mol CO_2 0.5 mol C_4H_{10} : 2 mol CO_2</p> <p>Jisim $\text{CO}_2 = 2 \times [12 + 2(16)]$ = 88 g <i>(reject answer without unit)</i></p>	1 1 1	3
		(iii)	<p>Butana $[(12 \times 4) / ((12 \times 4) + (1 \times 10))] \times 100\% = 82.76\%$</p> <p>Butena $[(12 \times 4) / ((12 \times 4) + (1 \times 8))] \times 100\% = 85.71\%$</p>	1 1	4

		<p>Butena menghasilkan lebih jelaga berbanding butana kerana peratus karbon per molekul butena lebih tinggi berbanding butana.</p> <p><i>Butene produce more soot than butane because the percentage of carbon per molecule is higher in butene compared to butane.</i></p>	1 + 1	
(c)	<p>[Able to describe the preparation of pentyl ethanoate by using named materials correctly]</p> <p>Answer:</p> <p>P1. Pentan-1-ol r: pentanol</p> <p>P2. Ethanoic acid Note: P1 & P2 can be deduce from procedure</p> <p>Sample answer: Procedure:</p> <p>P3. Pour [2-4] cm³ of glacial/pure ethanoic acid and [2-4] cm³ of pure pentan-1-ol into boiling tube and mix well.</p> <p>P4. Add slowly/a few drops of concentrated sulphuric acid into the mixture.</p> <p>P5. Heat gently/warm the mixture.</p> <p>P6. Pour the mixture into a beaker containing water.</p> <p>OR [reflux method]</p> <p>P3. Pour [25-50] cm³ of glacial/pure ethanoic acid and [25-50] cm³ of pure pentan-1-ol into the round bottom flask</p> <p>P4. Add [3-5] cm³ of concentrated sulphuric acid into the mixture.</p> <p>P5. Heat under reflux.</p> <p>P6. Collect the product formed by using distillation method</p> <p>P7. $\text{CH}_3\text{COOH} + \text{C}_5\text{H}_{11}\text{OH} \rightarrow \text{CH}_3\text{COOC}_5\text{H}_{11} + \text{H}_2\text{O}$</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1+1</p>	8	