



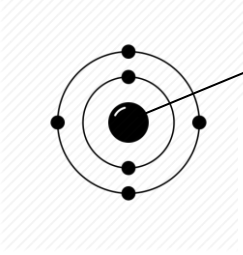
MODUL PINTAS TINGKATAN 5

Peperiksaan Percubaan Tahun 2019

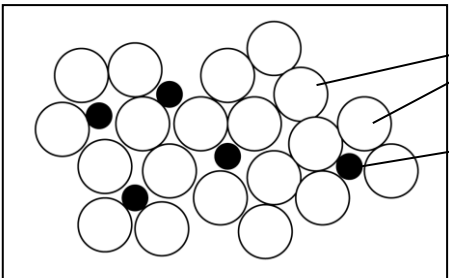
Skema Jawapan Chemistry

Kertas 2 4541/2

Section A
Bahagian A

Question Soalan		Answer Jawapan	Marks Markah
1	(a)	 <p>Nucleus P / Nukleus P $6p + 6n$</p> <ul style="list-style-type: none"> •Correct number of electrons and shells <i>Bilangan elektron dan petala yang betul</i> •Label nucleus <i>Label nukleus</i> 	1 1
	(b)	(i) Atom Q and atom R // Q and R <i>Atom Q dan atom R // Q dan R</i>	1
		(ii) Atom Q and atom R are atoms from the same element which has the same number of protons, 8 but different number of neutrons, 8 and 10 in the nucleus of the atom. <i>Atom Q dan atom R adalah atom-atom dari unsur yang sama di mana mempunyai bilangan proton yang sama, 8 tetapi bilangan neutron yang berlainan, 8 dan 10 di dalam nukleus atomnya.</i>	1
	(c)	(i) 2.8.1	1
		(ii) S_2O // Na_2O	1
		(iii) Red litmus paper turns to blue. <i>Kertas litmus merah berubah ke warna biru.</i>	1
	(d)	Element T is transition element. Element T shows different oxidation number. <i>Unsur T adalah unsur peralihan.</i> <i>Unsur T menunjukkan nombor pengoksidaan yang berbeza.</i>	1 1
TOTAL / JUMLAH			9

Question Soalan		Answer Jawapan	Marks Markah									
2	(a)	Blue colour of dry cobalt chloride paper changes to pink. <i>Warna biru kertas kobalt klorida kontang bertukar kepada merah jambu.</i>	1									
	(b)	(i) Mass of metal D = $(31.15 - 10.45) \text{ g} = 20.7 \text{ g}$ <i>Jisim logam D</i> Mass of oxygen = $(32.75 - 31.15) \text{ g} = 1.6 \text{ g}$ <i>Jisim oksigen</i>	1 1									
	(ii)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Element <i>Unsur</i></th> <th>D</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>Number of mole, mol <i>Bilangan mol, mol</i></td> <td>$\frac{20.7}{207}$ = 0.1</td> <td>$\frac{1.6}{16}$ = 0.1</td> </tr> <tr> <td>Ratio <i>Nisbah</i></td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Element <i>Unsur</i>	D	O	Number of mole, mol <i>Bilangan mol, mol</i>	$\frac{20.7}{207}$ = 0.1	$\frac{1.6}{16}$ = 0.1	Ratio <i>Nisbah</i>	1	1	1 + 1 1
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Ratio <i>Nisbah</i>	1	1										
	(iii)	DO	1									
	(c)	To ensure all oxide D has changed to metal D. <i>Untuk memastikan semua oksida D telah bertukar kepada logam D.</i>	1									
	(d)	Zinc is more reactive than hydrogen // Zinc oxide cannot be reduced by hydrogen gas. <i>Zink lebih reaktif daripada hidrogen // Zink oksida tidak boleh diturunkan oleh hidrogen.</i>	1									
		TOTAL / JUMLAH	9									

Question Soalan		Answer Jawapan	Marks Markah
3	(a)	(i) Copper <i>Kuprum</i>	1
		(ii) <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <p>Copper atom <i>Atom kuprum</i></p> <p>Tin atom <i>Atom stanum</i></p> <p>•Draw 2 types of atom <i>Melukis 2 jenis atom</i></p> <p>•Label the atom <i>Label atom</i></p> </div> </div>	1 1
		(iii) <ul style="list-style-type: none"> • The presence of tin atoms with different size disrupts the orderly arrangement of copper atoms in pure copper. • When force is applied on bronze, the presence of tin atoms reduce the layers of copper atom from sliding. • Bronze is harder and suitable to make monuments. • <i>Kehadiran atom stanum dengan saiz atom yang berlainan mengganggu susunan atom yang teratur dalam kuprum tulen.</i> • <i>Apabila daya dikenakan ke atas gangsa, kehadiran atom stanum mengurangkan lapisan atom-atom kuprum daripada menggelongsor.</i> • <i>Gangsa lebih keras dan sesuai digunakan untuk membuat monumen.</i> 	1 1 1
	(b)	(i) Hydrophilic part <i>Bahagian hidrofilik</i>	1
		(ii) <ul style="list-style-type: none"> • Soap anions react with magnesium ions or calcium ions in well water to form scum. • The cleansing action of soap on the oil stains in well water is less effective. • <i>Anion sabun bertindak balas dengan ion magnesium atau ion kalsium dalam air telaga untuk membentuk kekat.</i> • <i>Tindakan pencucian kotoran berminyak oleh sabun dalam air telaga kurang berkesan.</i> 	1 1
		(iii) Detergent <i>Detergen</i>	1
TOTAL / JUMLAH			10

Question Soalan		Answer Jawapan	Marks Markah
4	(a)	(i) 2-methylpropan-1-ol // 2-methylpropan-2-ol <i>2-metilpropan-1-ol // 2-metilpropan-2-ol</i>	1
		(ii) <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C} & -\text{C} & -\text{C}-\text{OH} \\ & & \\ \text{H} & \text{CH}_3 & \text{H} \end{array}$ </div> <div>or</div> <div style="text-align: center;"> $\begin{array}{c} & & \text{H} & & \\ & & & & \\ & \text{H} & -\text{C} & -\text{H} & \\ & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C}-\text{H} & \\ & & & & \\ \text{H} & & \text{O} & & \text{H} \\ & & & & \\ & & \text{H} & & \end{array}$ </div> </div>	1
		(iii) Has fruity smell. <i>Mempunyai bau buah-buahan.</i>	1
	(b)	Nickel is used to increase the rate of formation of compound P. <i>Nikel digunakan untuk menambahkan kadar pembentukan sebatian P.</i>	1
	(c)	(i) Oxidation reaction <i>Tindak balas pengoksidaan</i>	1
		(ii) $\text{C}_4\text{H}_8 + [\text{O}] + \text{H}_2\text{O} \rightarrow \text{C}_4\text{H}_8(\text{OH})_2$ <ul style="list-style-type: none"> • Correct chemical formula of reactants and products <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> • Balanced chemical equation <i>Persamaan kimia yang seimbang</i> 	1 1
	(d)	<ul style="list-style-type: none"> • Compound P and butene is flow through 1 cm³ of bromine water / acidified KMnO₄ solution in two test tube respectively. • The brown / purple colour of bromine water / acidified KMnO₄ solution in the test tube flowed with butene is turn to colourless. • While the test tube flowed with compound P remain unchanged. • <i>Sebatian P dan butena dialirkan melalui 1 cm³ air bromin / larutan KMnO₄ berasid dalam dua tabung uji berasingan.</i> • <i>Warna perang / ungu air bromin / larutan KMnO₄ berasid dalam tabung uji yang dialirkan butena berubah kepada tidak berwarna.</i> • <i>Manakala warna kekal tiada perubahan dalam tabung uji yang mengandungi sebatian P.</i> 	1 1 1
		TOTAL / JUMLAH	10

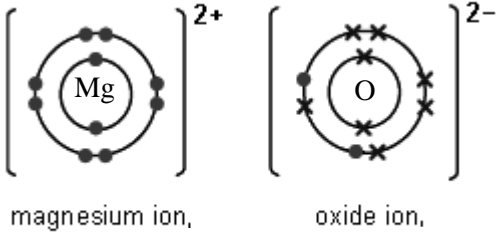
Question Soalan		Answer Jawapan	Marks Markah
5	(a)	(i) Acid is a chemical substance which can form free moving hydrogen ions when dissolve in water. <i>Asid merupakan bahan kimia yang membentuk ion hidrogen yang bebas bergerak apabila larut dalam air.</i>	1
		(ii) Colourless gas bubbles are released. <i>Gelembung-gelembung gas tidak berwarna terbebas.</i>	1
		(iii) $\text{Ca} + 2\text{H}^+ \rightarrow \text{Ca}^{2+} + \text{H}_2$ <ul style="list-style-type: none"> • Correct chemical formula of reactants and products <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> • Balanced ionic equation <i>Persamaan ion yang seimbang</i> 	1 1
		(iv) <ul style="list-style-type: none"> • HCl remains as neutral molecules in tetrachloromethane. • There is no free moving H^+ ions to react with calcium. • HCl kekal sebagai molekul neutral dalam tetraklorometana. • Tiada ion H^+ yang bebas bergerak untuk bertindak balas dengan kalsium. 	1 1
	(b)	(i) <ul style="list-style-type: none"> • Flow the gas produced through lime water in a test tube. • Lime water turns cloudy. • Alirkan gas yang terhasil melalui air kapur. • Air kapur menjadi keruh. 	1 1
		(ii) <ol style="list-style-type: none"> 1. $\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$ 2. Number of moles of $\text{CaCO}_3 = 1.0 / [40 + 12 + 3(16)] = 0.01 \text{ mol}$ 3. 1 mol of CaCO_3 reacts with 2 mol of HCl 0.01 mol of CaCO_3 reacts with 0.02 mol of HCl 4. Molarity of HCl = $0.02 \times 1000 / 25 = 0.8 \text{ mol dm}^{-3}$ 1. $\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$ 2. <i>Bilangan mol</i> $\text{CaCO}_3 = 1.0 / [40 + 12 + 3(16)] = 0.01 \text{ mol}$ 3. 1 mol CaCO_3 bertindak balas dengan 2 mol HCl 0.01 mol CaCO_3 bertindak balas dengan 0.02 mol HCl 4. <i>Kemolaran</i> HCl = $0.02 \times 1000 / 25 = 0.8 \text{ mol dm}^{-3}$ 	1 1 1
		TOTAL / JUMLAH	11

Question Soalan		Answer Jawapan	Marks Markah
6	(a)	(i) Metal displacement reaction <i>Tindak balas penyesaran logam</i>	1
		(ii) Zinc / Magnesium / Aluminium / Calcium It is more electropositive than copper // Its position is higher than copper in electrochemical Series. <i>Zink / Magnesium / Aluminium / Kalsium</i> <i>Ia lebih elektropositif daripada kuprum // Kedudukannya lebih tinggi daripada kuprum dalam siri elektrokimia.</i>	1 1
		(iii) $X \rightarrow X^{n+} + n e^- // Zn \rightarrow Zn^{2+} + 2e // Al \rightarrow Al^{3+} + 3e$	1
	(b)	(i) Allow ions to flow through it and complete the electric circuit. <i>Membenarkan ion mengalir melaluinya dan melengkapkan litar elektrik.</i>	1
	(ii)	<p>Negative terminal Terminal negatif</p> <p>Iron(II) sulphate solution <i>Larutan ferum(II) sulfat</i></p>	1
		(iii) Iron(II) ions donate 1 valence electron to form iron(III) ions. <i>Ion ferum(II) menderma 1 elektron valens untuk membentuk ion ferum(III).</i>	1
		(iv) The orange colour of acidified potassium dichromate(VI) solution changes to green. <i>Warna jingga larutan kalium dikromat(VI) berasid bertukar kepada hijau.</i>	1
		(v) $Cr_2O_7^{2-} + 14H^+ + 6Fe^{2+} \rightarrow 2Cr^{3+} + 7H_2O + 6Fe^{3+}$ <ul style="list-style-type: none"> • Correct chemical formula of reactants and products <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> • Balanced ionic equation <i>Persamaan ion yang seimbang</i> 	1 1
		(vi) Potassium chloride solution // Potassium bromide solution // Potassium iodide solution <i>Larutan kalium klorida // Larutan kalium bromida // Larutan kalium iodida</i>	1
		TOTAL / JUMLAH	11

Section B
Bahagian B

Question Soalan	Answer Jawapan	Marks Markah																	
7	(a)	(i)																	
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Electrode <i>Elektrod</i></td> <td style="width: 33%;">Anode (carbon) <i>Anod (karbon)</i></td> <td style="width: 33%;">Cathode (copper) <i>Katod (kuprum)</i></td> </tr> <tr> <td>Observation <i>Pemerhatian</i></td> <td>Colourless gas bubbles are released. <i>Gelembung-gelembung gas tidak berwarna terbebas.</i></td> <td>Electrode becomes thicker. <i>Elektrod menjadi menebal.</i></td> </tr> <tr> <td>Products <i>Hasil</i></td> <td>Oxygen gas <i>Gas oksigen</i></td> <td>Copper metal <i>Logam kuprum</i></td> </tr> <tr> <td>Half equation <i>Persamaan setengah</i></td> <td>$4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^-$</td> <td>$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$</td> </tr> <tr> <td>Factor that affects the product formed <i>Faktor yang mempengaruhi hasil yang terbentuk</i></td> <td>The position of hydroxide ions is lower than nitrate ions in the electrochemical series. <i>Kedudukan ion hidoksida adalah lebih rendah daripada ion nitrat dalam siri elektrokimia.</i></td> <td>The position of Copper(II) ions is lower than hydrogen ions in the electrochemical Series. <i>Kedudukan ion kuprum(II) adalah lebih rendah daripada ion hidrogen dalam siri elektrokimia.</i></td> </tr> </table>	Electrode <i>Elektrod</i>	Anode (carbon) <i>Anod (karbon)</i>	Cathode (copper) <i>Katod (kuprum)</i>	Observation <i>Pemerhatian</i>	Colourless gas bubbles are released. <i>Gelembung-gelembung gas tidak berwarna terbebas.</i>	Electrode becomes thicker. <i>Elektrod menjadi menebal.</i>	Products <i>Hasil</i>	Oxygen gas <i>Gas oksigen</i>	Copper metal <i>Logam kuprum</i>	Half equation <i>Persamaan setengah</i>	$4\text{OH}^- \rightarrow \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^-$	$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$	Factor that affects the product formed <i>Faktor yang mempengaruhi hasil yang terbentuk</i>	The position of hydroxide ions is lower than nitrate ions in the electrochemical series. <i>Kedudukan ion hidoksida adalah lebih rendah daripada ion nitrat dalam siri elektrokimia.</i>	The position of Copper(II) ions is lower than hydrogen ions in the electrochemical Series. <i>Kedudukan ion kuprum(II) adalah lebih rendah daripada ion hidrogen dalam siri elektrokimia.</i>	1 + 1	
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		<i>Kadar pengionan atom kuprum kepada ion kuprum(II) di anod sama dengan kadar nyahcas ion kuprum(II) kepada atom kuprum di katod.</i>	
(b)	(i)	<ul style="list-style-type: none"> The distance between R-Cu is further than the distance between Zn-Cu in electrochemical series. The further the distance between two metals in electrochemical series, the higher the potential difference. <i>Jarak antara R-Cu adalah lebih jauh daripada jarak antara Zn-Cu dalam siri elektrokimia.</i> <i>Semakin jauh jarak antara dua logam dalam siri elektrokimia, semakin tinggi perbezaan keupayaan.</i> 	1 1
	(ii)	<p>Cu, P, Zn, R</p> <p>The potential difference of R-P = $(2.00 - 1.10) \text{ V} + 0.35 \text{ V}$ $= (0.90 + 0.35) \text{ V}$ $= 1.25 \text{ V}$</p>	1 1
(c)		<ul style="list-style-type: none"> Functional chemical cell <i>Sel kimia berfungsi</i> Label diagram <i>Label gambarajah</i> <p>Accept any functional and labeled chemical cell. <i>Menerima sebarang sel kimia yang berfungsi dan berlabel.</i></p>	1 1
		TOTAL / JUMLAH	20

Question Soalan		Answer Jawapan	Marks Markah
8	(a)	(i) <ul style="list-style-type: none"> • MgO • Ionic bond <i>Ikatan ion</i> 	1 1
		(ii) <ul style="list-style-type: none"> • The electron arrangement of magnesium atom is 2.8.2. • Magnesium atom donates 2 valence electrons to form magnesium ion to achieve stable octet electron arrangement. • $Mg \rightarrow Mg^{2+} + 2e$ • The electron arrangement of oxygen atom is 2.6. • Oxygen atom gains 2 electrons to form oxide ion to achieve stable octet electron arrangement. • $O + 2e \rightarrow O^{2-}$ • One magnesium atom donates 2 electrons to one oxygen atom. • The strong electrostatic forces attract Mg^{2+} ion and O^{2-} ion to form an ionic compound, magnesium oxide. • <i>Susunan elektron atom magnesium ialah 2.8.2.</i> • <i>Atom magnesium menderma 2 elektron valens untuk membentuk ion magnesium untuk mencapai susunan elektron oktet yang stabil.</i> • $Mg \rightarrow Mg^{2+} + 2e$ • <i>Susunan elektron atom oksigen ialah 2.6.</i> • <i>Atom oksigen menerima 2 elektron untuk membentuk ion oksida untuk mencapai susunan elektron oktet yang stabil.</i> • $O + 2e \rightarrow O^{2-}$ • <i>Satu atom magnesium menderma 2 elektron kepada satu atom oksigen.</i> • <i>Daya tarikan elektrostatik yang kuat menarik ion Mg^{2+} dan ion O^{2-} untuk membentuk sebatian ion, magnesium oksida.</i> 	1 1 1 1 1 1 1 1 1 1 1 1 1 1
		(iii) <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <ul style="list-style-type: none"> • Structure of ion • <i>Struktur ion</i> • Label the structure • <i>Label struktur ion</i> </div> </div>	1 1
	(b)	(i) <ul style="list-style-type: none"> • Substance W is an ionic compound. • It has free moving ions in the molten state to conduct electricity. • Substance Z is a covalent compound. • It is made up of neutral molecules in all states, it has no free moving ions to conduct electricity in all states. • <i>Bahan W merupakan sebatian ion.</i> 	1 1 1 1

	<ul style="list-style-type: none"> • <i>Ia mempunyai ion yang bergerak bebas dalam keadaan leburan untuk mengkonduksikan elektrik.</i> • <i>Bahan Z merupakan sebatian kovalen.</i> • <i>Ia terdiri daripada molekul neutral dalam semua keadaan, ia tidak mempunyai ion yang bebas bergerak untuk mengkonduksikan elektrik.</i> 	
	(ii) Gas <ul style="list-style-type: none"> • Substance Z is a covalent compound. • The molecule of substance Z is attracted by weak Van der Waals forces. • Less heat energy is needed to overcome the force. • <i>Bahan Z merupakan sebatian kovalen.</i> • <i>Molekul bahan Z ditarik oleh daya tarikan Van der Waals yang lemah.</i> • <i>Kurang tenaga haba diperlukan untuk mengatasi daya tarikan tersebut.</i> 	1 1 1 1
	TOTAL / JUMLAH	20

Section C
Bahagian C

Question <i>Soalan</i>		Answer <i>Jawapan</i>		Marks <i>Markah</i>	
9	(a)	(i)	<ul style="list-style-type: none"> • Hydrochloric acid / Nitric acid • <i>Asid hidroklorik / Asid nitrik</i> • Ethanoic acid • <i>Asid etanoik</i> 	1 1	
		(ii)	<ul style="list-style-type: none"> • The heat of neutralization of experiment I is higher than experiment II. • Hydrochloric acid / Nitric acid in experiment I is a strong acid which ionizes completely in water to produce high concentration of hydrogen ions. • All the heat released in the neutralization reaction rises the temperature of the solution completely. • Ethanoic acid in experiment II is a weak acid which ionizes partially in water to produce low concentration of hydrogen ions. • Some of the heat released in the neutralization reaction is used to dissociate the molecules of ethanoic acid. • <i>Haba peneutralan eksperimen I lebih tinggi daripada eksperimen II.</i> • <i>Asid hidroklorik / Asid nitrik dalam eksperimen I merupakan asid kuat yang mengion lengkap dalam air untuk menghasilkan kepekatan ion hidrogen yang tinggi.</i> • <i>Semua haba yang terbebas dalam tindak balas peneutralan menaikkan suhu larutan sepenuhnya.</i> • <i>Asid etanoik dalam eksperimen II merupakan asid lemah yang mengion separa dalam air untuk menghasilkan kepekatan ion hidrogen yang rendah.</i> • <i>Sebahagian haba yang terbebas dalam tindak balas peneutralan digunakan untuk mengurai molekul asid etanoik tersebut.</i> 	1 1 1 1 1	
(b)	Diagram <i>Rajah</i>		9.1	9.2	1 1 1
	Type of reaction <i>Jenis tindak balas</i>	Exothermic reaction <i>Tindak balas eksotermik</i>	Endothermic reaction <i>Tindak balas endotermik</i>		
	Temperature change <i>Perubahan suhu</i>	Temperature increase <i>Suhu meningkat</i>	Temperature decrease <i>Suhu menurun</i>		
	Change in total energy content in reactants and products <i>Perubahan jumlah kandungan tenaga dalam bahan tindak</i>	The total energy content of the product is lower than the total energy of the reactants <i>Jumlah kandungan tenaga hasil tindak</i>	The total energy content of the product is higher than the total energy of the reactants <i>Jumlah kandungan tenaga hasil tindak</i>		

		<i>balas dan hasilnya</i>	<i>balas adalah lebih rendah daripada jumlah kandungan tenaga dalam bahan tindak balas.</i>	<i>balas adalah lebih tinggi daripada jumlah kandungan tenaga dalam bahan tindak balas.</i>	
	(c)	<p>Procedures:</p> <ol style="list-style-type: none"> 1. 100 cm³ of water is measured with measuring cylinder and poured into a copper can. 2. A thermometer is placed into the water and the initial temperature is measured, T₁ and recorded. 3. A lamp is filled with fuel X and is weighed, the initial mass, m₁ is recorded. 4. The lamp is placed near the bottom of the copper can and the wick is lighted immediately. 5. The water is stirred continuously with the thermometer until its temperature increased by 30 °C, the flame is put off and the highest temperature, T₂ reached by the water is recorded. 6. The final mass of the lamp and the fuel X, m₂ is weighed immediately and recorded. 7. Steps 1 to 8 are repeated with fuel Y. <ol style="list-style-type: none"> 1. 100 cm³ air disukat dengan silinder penyukat dan tuang ke dalam tin kuprum. 2. Termometer diletak di dalam air dan suhu awal diukur, T₁ dan direkod. 3. Pelita diisi dengan bahan api X dan ditimbang, jisim awal m₁ direkod. 4. Pelita diletak dekat dengan tin kuprum dan sumbu pelita dinyalakan dengan segera. 5. Air tersebut dikacau berterusan dengan termometer sehingga suhunya meningkat sebanyak 30 °C, api dipadamkan dan suhu tertinggi, T₂ direkod. 6. Jisim akhir pelita, m₂ dan kandungannya segera ditimbang dan direkod. 7. Langkah 1 hingga 8 diulangi dengan menggunakan bahan api Y. 			<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>

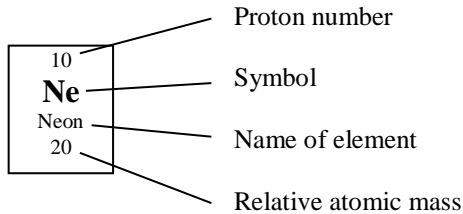
	<p>Calculation the heat of combustion <i>Pengiraan haba pembakaran</i></p> <p>Heat released = $[(100)(4.2)(T_2 - T_1)]$ J <i>Haba terbebas</i> = H kJ</p> <p>Number of mole of fuel X burnt = $\left[\frac{(m_1 - m_2)}{86} \right]$ mol <i>Bilangan mol bahan api X terbakar</i> = x mol</p> <p>The heat of combustion of fuel X, $\Delta H = - \left[\frac{H}{x} \right]$ kJmol⁻¹ <i>Haba pembakaran bahan api X</i></p>	<p>1</p> <p>1</p> <p>1</p>
	TOTAL / JUMLAH	20

Question Soalan		Answer Jawapan	Marks Markah
10	(a)	Bottle X is zinc carbonate. <i>Botol X ialah zink karbonat.</i> Bottle Y is zinc nitrate. <i>Botol Y ialah zink nitrat.</i>	1 1
	(b)	$ZnCO_3 \rightarrow ZnO + CO_2 // 2Zn(NO_3)_2 \rightarrow 2ZnO + 4NO_2 + O_2$ <ul style="list-style-type: none"> • Correct chemical formula of reactants and products <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> • Balanced chemical equation <i>Persamaan kimia yang seimbang</i> 	1 1
	(c)	1. 2 cm ³ of zinc nitrate solution is poured into a test tube.	1
		2. 2 cm ³ of dilute sulphuric acid is added to the solution.	1
		3. 2 cm ³ of iron(II) sulphate solution is added to the solution.	1
		4. The mixture is shaken well and the test tube is slanted.	1
		5. A few drops of concentrated sulphuric acid are dropped along the wall of the test tube and then the test tube is held upright.	1
		6. A brown ring is formed. The anion present is nitrate ion.	1
	(d)	1. 2 cm ³ larutan zink nitrat dituang ke dalam tabung uji.	
		2. 2 cm ³ asid sulfurik cair ditambah kepada larutan.	
		3. 2 cm ³ larutan ferum(II) sulfat ditambah kepada larutan.	
		4. Campuran digoncang dengan baik dan tabung uji dicondongkan.	
		5. Beberapa titis asid sulfurik pekat dititis sepanjang dinding tabung uji dan kemudian tabung uji ditegakkan.	
		6. Cincin perang terbentuk. Anion yang hadir ialah ion nitrat.	
	(d)	1. 100 cm ³ of 1 moldm ⁻³ of sulphuric acid is measured and poured into a beaker.	1
		2. Sulphuric acid is heated gently.	1
		3. Zinc carbonate powder is added into the sulphuric acid and the mixture is stirred with a glass rod.	1
		4. Zinc carbonate powder is added into the sulphuric acid until excess.	1
		5. The mixture is filtered to separate the undissolved zinc carbonate powder.	1
		6. The filtrate is poured into evaporating dish and evaporated until saturated.	1
		7. The saturated solution is cooled at room temperature until crystals are formed.	1
		8. The mixture is filtered and the crystals zinc sulphate are dried by pressing them between filter papers.	1
		1. 100 cm ³ 1 moldm ⁻³ asid sulfurik disukat dan dituang ke dalam satu bikar.	
		2. Asid sulfurik dipanaskan secara perlahan.	
		3. Serbuk zink karbonat ditambah ke dalam asid sulfurik dan campuran tersebut dikacau dengan rod kaca.	
		4. Serbuk zink karbonat ditambah ke dalam asid sulfurik sehingga berlebihan.	
		5. Campuran dituras untuk mengasingkan serbuk zink karbonat yang tidak terlarut.	

	<p>6. Hasil turasan dituang ke dalam mangkuk penyejat dan disejatkan sehingga tepu.</p> <p>7. Larutan tepu yang terhasil kemudian disejukkan bawah suhu bilik sehingga hablur terbentuk.</p> <p>8. Campuran tersebut dituraskan dan hablur zink sulfat dikeringkan dengan menekan pada dua keping kertas turas.</p> <p>The chemical equation involved: <i>Persamaan kimia yang terlibat:</i> $\text{H}_2\text{SO}_4 + \text{ZnCO}_3 \rightarrow \text{ZnSO}_4 + \text{CO}_2 + \text{H}_2\text{O}$</p> <ul style="list-style-type: none"> • Correct chemical formula of reactants and products <i>Formula kimia bagi bahan dan hasil tindak balas yang betul</i> • Balanced chemical equation <i>Persamaan kimia yang seimbang</i> 	<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