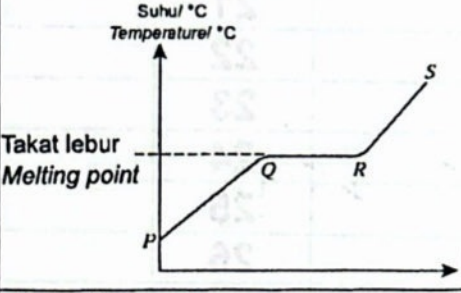


SKEMA PEMARKAHAN MPP3 KERTAS 1
KIMIA 4541/1

NO	JAWAPAN	NO	JAWAPAN
1	D	21	A
2	A	22	D
3	B	23	C
4	A	24	C
5	A	25	D
6	B	26	B
7	D	27	C
8	B	28	C
9	B	29	D
10	D	30	C
11	C	31	C
12	B	32	C
13	B	33	B
14	D	34	B
15	A	35	A
16	A	36	D
17	C	37	A
18	A	38	D
19	D	39	A
20	B	40	C

SKEMA PEMARKAHAN KIMIA TINGKATAN 5
MODUL PERKEMBANGAN PEMBELAJARAN 3 (MPP3) 2026

No soalan			Rubrik	Sub markah	Markah
1	(a)		Molekul// Molecule		1
	(b)		Cecair// Liquid		1
	(c)				1
	(d)		Haba diserap dan digunakan untuk mengatasi daya tarikan antara molekul <i>heat is absorbed and is used to overcome the force of attraction between molecule</i>		1 1
			JUMLAH		5

No soalan			Rubrik	Sub markah	Markah
2	(a)		Antioksidan // antioxidant // pengantioksida		1
	(b)	(i)	Menambah warna pada makanan supaya menarik <i>Add colour to the food to make food look attractive</i>		1
		(ii)	Menambah rasa dan bau harum pada makanan <i>To add flavour and fragrance smell to the food.</i>		1
	(c)		Gula // sugar		1
			Aspartam // Aspartame		1
			Stevia// stevia		
			JUMLAH		5

No soalan			Rubrik	Sub markah	Markah
3	(a)	(i)	Kaca gentian// Fibre glass		1
		(ii)	Bamper kereta// Car bumper	1	2
			Papan litar tercetak// Printed circuit board	1	
	(b)	(i)	Tahan kejutan terma // rintangan tinggi terhadap haba <i>Can withstand to thermal shock // high resistant to heat</i>		1
		(ii)	Jubin // Mangkuk tandas// Sinki porselin// Batu bata <i>Tiles // Toilet bowl // porcelain sink // Brick</i>	1	2
			[mana-mana dua/ Any two]	1	
			JUMLAH		6

No soalan		Rubrik	Sub markah	Markah
4	(a)	Al_2O_3		1
	(b)	Alirkan gas X ke dalam air kapur. Air kapur bertukar menjadi keruh <i>Flow gas X into lime water</i> <i>The lime water turns cloudy</i>		1 1
	(c)	$\text{Al}^{3+} + 3\text{e} \rightarrow \text{Al}$		1 1
	(d) (i)	Pembaziran sumber alam-proses pengestrakan aluminium menggunakan tenaga elektrik yang sangat tinggi // Pembebasan gas karbon dioksida, menyebabkan masalah kesan rumah hijau/ pemanasan global // Proses penulenaan bauksit turut menghasilkan sisa bauksit dalam bentuk enapcemar merah yang bersifat toksik <i>Waste of natural resources - the aluminium extraction process uses very high levels of electrical energy //</i> <i>The release of carbon dioxide gas causes the problem of the greenhouse effect / global warming //</i> <i>The bauxite refining process also produces bauxite waste in the form of red sludge which is toxic.</i>		1
	(ii)	Kitar semula aluminium <i>Aluminium recycling</i>		1
		JUMLAH		7

No soalan			Rubrik	Sub Markah	Markah
5	(a)	(i)	Molekul gergasi <i>Giant molecule</i>		1
		(ii)	Takat lebur molekul X lebih tinggi berbanding molekul ringkas Molekul ringkas mempunyai daya tarikan antara molekul yang lemah menyebabkan sedikit tenaga haba diperlukan untuk mengatasi daya ini. Molekul X mempunyai ikatan kovalen yang kuat dalam molekul menyebabkan banyak tenaga haba diperlukan untuk memutuskan ikatan ini. <i>The melting point of molecule X is higher than simple molecule Simple molecules have weak intermolecular attractive forces, so little heat energy is required to overcome the forces. Molecule X has strong covalent bonds in the molecule, so much heat energy is required to break these bonds.</i>	1 1 1	3
	(b)	(i)	Menyambung kembali kedua-dua logam. <i>Reconnect the two metals.</i>		1
		(ii)	Elektron valens atom logam <u>didermakan</u> dan membentuk elektron <u>dinyahsetempat</u>. <i>P1</i> Elektron ini bergerak bebas antara struktur logam membentuk <u>lautan elektron</u>. Elektron yang bebas <u>bergerak dari terminal negatif ke terminal positif</u> dan membawa cas elektrik apabila elektrik dibekalkan <i>Valence electrons of metal atoms is donated and form delocalized electrons. These electrons move freely between the metal structure to form a sea of electrons. The delocalized electrons move freely from the negative terminal to the positive terminal and carry an electric charge when electricity is supplied</i>	1 1 1	3
JUMLAH					8

No soalan		Rubrik	Sub markah	Markah
6	(a)	Kalsium karbonat // Calcium carbonate		1
	(b)	$\text{CaCO}_3 + 2\text{HNO}_3 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{CO}_2 + \text{H}_2\text{O}$ Formula kimia betul Persamaan seimbang	1 1	2
	(c)	(i) Set III		1
		(ii) Lengkung yang betul bagi Set I <i>Correct curve for Set I</i> Lengkung yang betul bagi Set III <i>Correct curve for Set III</i> Isi padu gas (cm^3)	1 1	2
		(iii) 1. Kadar tindak balas Set III lebih tinggi daripada Set II 2. Suhu dalam Set III lebih tinggi daripada Set II // Tenaga kinetik zarah dalam Set III lebih tinggi daripada Set II 3. Lebih banyak zarah bertenaga mengatasi tenaga pengaktifan dalam Set III // Frekuensi perlanggaran berkesan antara ion H^+ dan kalsium karbonat / kulit kerang dalam Set III lebih tinggi daripada Set II. 1. <i>Rate of reaction of Set III is higher than Set II</i> 2. <i>Temperature in Set III is higher than Set II</i> <i>The kinetic energy of particles in Set III is higher than Set II</i> 3. <i>More energetic particles overcome the activation energy in Set III //</i> <i>Frequency of effective collision between H^+ ions and calcium carbonate / cockle shells in Set III is higher than Set II</i>	1 1 1	3
JUMLAH				9



No soalan			Rubrik	Sub markah	Markah
7	(a)		Molekul <i>Molecule</i>		1
	(b)	(i)	$\text{HCl} + \text{NH}_3 \rightarrow \text{NH}_4\text{Cl}$ [Formula kimia betul dan persamaan kimia seimbang] [<i>Correct chemical formula and balance chemical equation</i>]	1 1	2
		(ii)	1 mol hidrogen klorida/ HCl bertindak balas dengan 1 mol ammonia/ NH_3 menghasilkan 1 mol ammonium klorida/ NH_4Cl 1 mol of <i>hydrogen chloride</i> / HCl react with 1 mol of <i>ammonia</i> / NH_3 produce 1 mol of <i>ammonium chloride</i> / NH_4Cl		1
		(iii)	Tidak <i>No</i>		1
	(c)		T_1 Gas ammonia kurang tumpat/ lebih ringan berbanding gas hidrogen klorida Kadar resapan gas ammonia lebih tinggi T_1 <i>Ammonia gas less densel lighter than hydrogen chloride gas.</i> <i>The rate of diffusion of ammonia gas is higher.</i>	1 1 1	3
	(d)		$\text{C}_6\text{H}_{12}\text{O}_6$ // Formula molekul Mempunyai bilangan sebenar atom untuk menulis / mengimbangkan persamaan kimia dengan tepat $\text{C}_6\text{H}_{12}\text{O}_6$ // <i>molecular formula</i> <i>Has the actual number of atoms needed to write / to balance the chemical equation accurately</i>	1 1	2
JUMLAH					10

No soalan		Rubrik	Sub markah	Markah
8	(a)	Biru <i>Blue</i>		1
	(b)	Nilai E^0 // Kepekatan elektrolit larutan akueus // Jenis elektrod E^0 value // Concentration of electrolyte in aqueous state // Type of electrode		1
	(c)	(i) Penurunan <i>Reduction</i>		1
		(ii) Kuprum// <i>Copper</i> Ion kuprum(II) menerima elektron membentuk atom kuprum// Ion kuprum(II) diturunkan kepada atom kuprum <i>Copper(II) ion gain electron to form copper atom//</i> <i>Copper(II) ion is reduced to form copper atom</i>	1 1	2
	(d)	Anod: gelembung gas kuning kehijauan Ion klorida dipilih nyahcas Kepekatan ion klorida / Cl^- lebih tinggi berbanding ion hidroksida/ OH^- <i>Anode: greenish yellow bubble gas</i> <i>Concentration of chloride/Cl^- ion is higher than hydroxide/OH^- ion</i>	1 1 1	3
	(e)	Tukar kedudukan kunci besi di katod/ terminal negatif bateri Ion argentum menerima elektron membentuk atom argentum di katod ATAU Tukar elektrod argentum di anod/ terminal positif bateri Atom Argentum membebaskan elektron membentuk ion argentum di anod <i>Swap the position of the iron key at the cathode / negative terminal of the battery</i> <i>Argentum ions receive electrons to form argentum atoms at the cathode</i> OR <i>Argentum electrode at the anode / positive terminal of the battery</i> <i>Argentum atoms release electrons to form argentum ions at the anode</i>	1 1	2
JUMLAH			10	

No soalan		Rubrik	Sub markah	Markah
9	(a)	Tertib pertambahan nombor proton // <i>tertib nombor proton</i> <i>In order of increasing proton number y menaik.</i>	1	3
		Kala 2// <i>Period 2</i> Atom R mempunyai dua petala berisi elektron <i>Atom R has two shells occupied with electrons</i>	1 1	
	(b)	(i) Ikatan yang terbentuk melalui pemindahan elektron atau perkongsian elektron Susunan elektron atom P ialah 2.8.2 dan atom O/ oksigen ialah 2.6 Untuk mencapai susunan elektron oktet Atom P menderma dua elektron dan membentuk ion P ²⁺ Atom oksigen menerima dua elektron dan membentuk ion oksida/ O ²⁻ Ion-ion P ²⁺ dan ion oksida/ O ²⁻ ditarik oleh daya elektrostatik dan membentuk sebatian PO <i>A bond formed through the transferring of electron or sharing of electrons</i> <i>Electron arrangement of atom P is 2.8.2 and atom O is 2.6</i> <i>To achieve stable octet electron arrangement</i> <i>Atom P donate two electron and forms P²⁺ ion</i> <i>Atom Q receive two electron forms O²⁻ ion</i> <i>P²⁺ and O²⁻ ions are attracted by electrostatic force to form PO compound</i>	1 1 1 1 1	6
		(ii) $R + O_2 \rightarrow RO_2$ // $C + O_2 \rightarrow CO_2$ [Formula kimia betul dan persamaan kimia seimbang] [<i>Correct chemical formula and balance chemical equation</i>]	1 1	
	(c)	Sifat <i>Property</i>	Sebatian PO <i>PO compound</i>	Sebatian RO <i>RO compound</i>
		Takat lebur <i>Melting point</i>	Tinggi Daya elektrostatik yang kuat antara ion Banyak haba diperlukan untuk mengatasi daya	Rendah Daya Van Der Waals antara molekul yang lemah Sedikit haba diperlukan untuk mengatasi daya



No soalan			Rubrik			Sub markah	Markah
				<i>High Strong electrostatic force between ions More heat is needed to overcome the force</i>	<i>Low Weak Van Der Waals force force between molecule Less heat is needed to overcome the force</i>		
			Kekonduksian elektrik <i>Electrical conductivity</i>	Boleh mengalirkan arus elektrik dalam keadaan leburan atau akueus Ada ion-ion yang bebas bergerak <i>Able to conduct electricity in molten or aqueous state Contains free moving ions</i>	Tidak boleh mengalirkan arus elektrik dalam semua keadaan Tiada ion yang bebas bergerak// wujud sebagai molekul <i>Unable to conduct electricity any state No free moving ion// exist as a molecule</i>	1	
						1	5
	(d)		Oksida P tidak bertindak balas dengan larutan natrium hidroksida/ NaOH tetapi bertindak balas dengan asid hidroklorik/ HCl Oksida P menunjukkan sifat bes Oksida R bertindak balas dengan larutan natrium hidroksida/ NaOH tetapi tidak bertindak balas dengan asid hidroklorik/ HCl Oksida R menunjukkan sifat asid <i>P Oxide not react with sodium hydroxide solution but react with hydrochloric acid P oxide shows the properties of base</i> <i>R Oxide react with sodium hydroxide solution but not react with hydrochloric acid R oxide shows the properties of acidic</i>			1	
						1	
						1	
						1	4
			JUMLAH				20

No soalan		Rubrik	Sub Markah	Marka								
10	(a)	Penguraian ganda dua <i>Double decomposition</i>		1								
	(b)	X : Barium nitrat// <i>Barium nitrate</i> Y : Plumbum (II) nitrat// <i>Lead (II) nitrate</i> $\text{Ba}^{2+} + \text{SO}_4^{2-} \rightarrow \text{BaSO}_4$ ATAU $\text{Pb}^{2+} + 2\text{Cl}^- \rightarrow \text{PbCl}_2$ Bil. Mol X = $\frac{50 \times 0.5}{1000}$ // 0.025 1 mol larutan X : 1 mol barium sulfat 0.025 mol larutan X : 0.025 mol barium sulfat 1 mol of solution X : 1 mol of barium sulfate 0.025 mol of barium nitrate : 0.025 mol of barium sulfate Jisim barium sulfat = (0.025×233) g // 5.825 g <i>Mass of barium sulfate</i>	1 1 1 1 1 1	6								
	(c)	(i) <table border="1"><thead><tr><th>Tindak balas / Reaction I</th><th>Tindak balas / Reaction II</th></tr></thead><tbody><tr><td>$Q = (100)(4.2)(33-30)$ = 1260 J</td><td>$Q = (100)(4.2)(29-27)$ = 840 J</td></tr><tr><td>$n = 0.025 \text{ mol}$</td><td>$n = 0.025 \text{ mol}$ <i>0.0125 mol</i></td></tr><tr><td>$\Delta H = \frac{1260}{0.025}$ = - 50.4 kJ/ mol</td><td>$\Delta H = \frac{840}{0.025}$ <i>0.0125</i> = + 33.6 kJ/ mol</td></tr></tbody></table> <i>= + 67.2 kJ mol⁻¹</i>	Tindak balas / Reaction I	Tindak balas / Reaction II	$Q = (100)(4.2)(33-30)$ = 1260 J	$Q = (100)(4.2)(29-27)$ = 840 J	$n = 0.025 \text{ mol}$	$n = 0.025 \text{ mol}$ <i>0.0125 mol</i>	$\Delta H = \frac{1260}{0.025}$ = - 50.4 kJ/ mol	$\Delta H = \frac{840}{0.025}$ <i>0.0125</i> = + 33.6 kJ/ mol	1+1 1+1 1+1	6
Tindak balas / Reaction I	Tindak balas / Reaction II											
$Q = (100)(4.2)(33-30)$ = 1260 J	$Q = (100)(4.2)(29-27)$ = 840 J											
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$\Delta H = \frac{1260}{0.025}$ = - 50.4 kJ/ mol	$\Delta H = \frac{840}{0.025}$ <i>0.0125</i> = + 33.6 kJ/ mol											
	(ii)	Tindakbalas/ Reaction I $\text{Ba}^{2+} + \text{SO}_4^{2-}$ Tenaga $\Delta H = -50.4 \text{ kJ/mol}$ BaSO_4	1+1									

No soalan	Rubrik	Sub Markah	Markah								
	Tindak balas/ Reaction II Tenaga $\text{Pb}^{2+} + 2\text{Cl}^-$ PbCl_2 $\Delta H = + 33.6 \text{ kJ/ mol}$	1+1									
	<table><tr><th>Tindak balas/ Reaction I</th><th>Tindak balas/ Reaction II</th></tr><tr><td>Eksotermik <i>Exothermic</i></td><td>Endotermik <i>Endothermic</i></td></tr><tr><td>Jumlah kandungan haba bahan tindak balas lebih tinggi daripada hasil tindak balas <i>The total heat content of the reactant is higher than the products</i></td><td>Jumlah kandungan haba hasil tindak balas lebih tinggi daripada bahan tindak balas <i>The total heat content of the products is higher than the reactants</i></td></tr><tr><td>Haba yang dibebaskan semasa pembentukan ikatan lebih tinggi daripada haba yang diserap semasa pemutusan ikatan <i>The heat released during bond formation is higher than the heat absorbed during bond breaking</i></td><td>Haba yang diserap semasa pemutusan ikatan lebih tinggi daripada haba yang dibebaskan semasa pembentukan ikatan. <i>The heat absorbed during bond breaking is higher than the heat released during bond formation.</i></td></tr></table>	Tindak balas/ Reaction I	Tindak balas/ Reaction II	Eksotermik <i>Exothermic</i>	Endotermik <i>Endothermic</i>	Jumlah kandungan haba bahan tindak balas lebih tinggi daripada hasil tindak balas <i>The total heat content of the reactant is higher than the products</i>	Jumlah kandungan haba hasil tindak balas lebih tinggi daripada bahan tindak balas <i>The total heat content of the products is higher than the reactants</i>	Haba yang dibebaskan semasa pembentukan ikatan lebih tinggi daripada haba yang diserap semasa pemutusan ikatan <i>The heat released during bond formation is higher than the heat absorbed during bond breaking</i>	Haba yang diserap semasa pemutusan ikatan lebih tinggi daripada haba yang dibebaskan semasa pembentukan ikatan. <i>The heat absorbed during bond breaking is higher than the heat released during bond formation.</i>	1 1 1	7
Tindak balas/ Reaction I	Tindak balas/ Reaction II										
Eksotermik <i>Exothermic</i>	Endotermik <i>Endothermic</i>										
Jumlah kandungan haba bahan tindak balas lebih tinggi daripada hasil tindak balas <i>The total heat content of the reactant is higher than the products</i>	Jumlah kandungan haba hasil tindak balas lebih tinggi daripada bahan tindak balas <i>The total heat content of the products is higher than the reactants</i>										
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	JUMLAH		20								

No soalan		Rubrik	Sub Markah	Markah
11	(a)	Polimer ialah molekul berantai panjang yang terhasil daripada pencantuman banyak ulangan unit asas. <i>Polymers are long-chain molecules formed by the joining of many repeating basic units.</i>	1	7
		Kloroetena/ <i>Chloroethene</i> Polietena/ <i>Polyethene</i>	1 1	
		Polimer/ <i>Polymer A</i> $n \begin{array}{c} \text{H} & \text{H} \\ & \\ \text{C} & = & \text{C} \\ & \\ \text{H} & \text{Cl} \end{array} \rightarrow \left(\begin{array}{c} \text{H} & \text{H} \\ & \\ -\text{C} & - & \text{C}- \\ & \\ \text{H} & \text{Cl} \end{array} \right)_n$	1 1	
		Formula kimia bahan tindak balas yang betul Formula hasil tindak balas yang betul Polimer/ <i>Polymer B</i> $n \begin{array}{c} \text{H} & \text{H} \\ & \\ \text{C} & = & \text{C} \\ & \\ \text{H} & \text{H} \end{array} \rightarrow \left[\begin{array}{c} \text{H} & \text{H} \\ & \\ -\text{C} & - & \text{C}- \\ & \\ \text{H} & \text{H} \end{array} \right]_n$	1 1	
	(b)	(i) 1. P: Alkena 2. Q: Etanol 3. R: Butana 4. Sebatian R ialah hidrokarbon tepu manakala sebatian P ialah hidrokarbon tidak tepu 5. Sebatian R tidak bertindak balas dengan larutan kalium manganat(VII) berasid manakala sebatian P mengalami tindak balas penambahan/ pengoksidaan 1. P: <i>Alkene</i> 2. Q: <i>Ethanol</i> 3. R: <i>Butane</i> 4. <i>Compound R is a saturated hydrocarbon while compound P is an unsaturated hydrocarbon.</i> 5. <i>Compound R does not react with acidified potassium manganate(VII) solution while compound P undergoes an addition/ oxidation reaction</i>	1 1 1 1 1	5
		(ii) 1. Etil butanoat	1	

No soalan			Rubrik	Sub Markah	Markah
			2. Masukkan 2 cm ³ asid butanoik glasial ke dalam tabung didih.	1	8
			3. Tambah 4 cm ³ etanol mutlak kepada asid butanoik glasier.	1	
			4. Tambah lima titik asid sulfurik pekat ke dalam campuran dengan penitis.	1	
			5. Goncangkan tabung didih.	1	
			6. Panaskan campuran perlahan-lahan selama dua hingga tiga minit	1	
			7. Tuangkan kandungan tabung didih ke dalam bikar yang berisi separuh air.	1	
			8. Rekodkan pemerhatian / <i>bm, warna dan ketidakhadiran hasil.</i>	1	
			1. Ethyl butanoate		
			2. Put 2 cm ³ of glacial butanoic acid in a boiling tube.		
			3. Add 4 cm ³ of absolute ethanol to the glacial butanoic acid.		
			4. Add five drops of concentrated sulphuric acid into the mixture with a dropper.		
			5. Shake the boiling tube.		
			6. Heat the mixture gently for two to three minutes		
			7. Pour the content of the boiling tube into a beaker half filled with water.		
			8. Record the observation		
			JUMLAH		20