

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah						
1	(a)	(i)	Molekul / <i>Molecule</i>	1	1						
		(ii)	1. Unsur 2. Sebatian <u>Jawapan</u> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Unsur <i>Element</i></th> <th>Sebatian <i>Compound</i></th> </tr> </thead> <tbody> <tr> <td>Iodin / <i>Iodine</i> / I₂</td> <td>Tetraklorometana / <i>Tetrachloromethane</i> / CCl₄</td> </tr> <tr> <td>Aluminium / <i>Aluminium</i> / Al</td> <td>Kuprum(II) sulfat / <i>Copper(II) sulphate</i> / CuSO₄</td> </tr> </tbody> </table>	Unsur <i>Element</i>	Sebatian <i>Compound</i>	Iodin / <i>Iodine</i> / I ₂	Tetraklorometana / <i>Tetrachloromethane</i> / CCl ₄	Aluminium / <i>Aluminium</i> / Al	Kuprum(II) sulfat / <i>Copper(II) sulphate</i> / CuSO ₄	1 1	2
Unsur <i>Element</i>	Sebatian <i>Compound</i>										
Iodin / <i>Iodine</i> / I ₂	Tetraklorometana / <i>Tetrachloromethane</i> / CCl ₄										
Aluminium / <i>Aluminium</i> / Al	Kuprum(II) sulfat / <i>Copper(II) sulphate</i> / CuSO ₄										
	(b)	(i)	Proton, neutron, electron <i>Proton, neutron, electron</i>	1	1						
		(ii)	11	1	1						
Jumlah					5						

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah
2	(a)	(i)	Silika // silikon dioksida // silikon(IV) oksida <i>Silica // silicon dioxide // silicon(IV) oxide</i>	1	1
		(ii)	1. Kaca plumbum // kaca kristal plumbum <i>Lead glass // lead crystal glass</i> 2. Kaca soda kapur / <i>Soda lime glass</i>	1 1	2
	(b)	(i)	Bahan yang terdiri daripada gabungan dua atau lebih bahan yang bukan homogen, iaitu bahan matriks dan bahan pengukuhan. <i>Material made from combining two or more non-homogeneous substances, which are matrix substance and strengthening substance.</i>	1	1
		(ii)	Konkrit diperkukuhkan / <i>Reinforced concrete</i>	1	1
Jumlah					5

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah
3	(a)	(i)	Boleh membentuk ion kompleks <i>Can form complex ions</i>	1	1
		(ii)	Platinum / Pt	1	1
		(iii)	1. Formula bahan tindak balas dan hasil tindak balas betul <i>Correct formula of reactants and product</i> 2. Persamaan seimbang <i>Balanced chemical equation</i> <u>Jawapan :</u> $N_2 + 3H_2 \rightarrow 2NH_3$	1 1	2
	(b)	(i)	Argon r : Ar	1	1

		(ii)	Lengai secara kimia // Tidak bertindak balas dengan tungsten <i>Chemically inert // Does not react with tungsten</i>	1	1
			Jumlah		6

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah
4	(a)	(i)	Natrium klorida // Sodium chloride // NaCl	1	1
		(ii)	1. Ammonia larut dalam air. <i>Ammonia dissolves / is soluble in water.</i>	1	2
			2. Molekul ammonia membentuk ikatan hidrogen dengan molekul air. <i>Ammonia molecule forms hydrogen bond with water molecule.</i>	1	
	(b)	(i)	1. Leburan natrium klorida / sebatian ion boleh mengkonduksikan elektrik, naftalena / sebatian kovalen tidak boleh mengkonduksikan elektrik. <i>Molten sodium chloride / ionic compound can conduct electricity, naphthalene / covalent compound cannot conduct electricity.</i>	1	2
			2. Terdapat ion-ion yang bergerak bebas dalam leburan natrium klorida / sebatian ion. Tiada ion-ion yang bergerak bebas dalam naftalena // Molekul naftalena bersifat neutral // Molekul dalam sebatian kovalen bersifat neutral. <i>There are free moving ions in molten sodium chloride / ionic compound.</i> <i>There are no free moving ions in naphthalene / covalent compound //</i> <i>Naphthalene molecules are neutral // Molecules in covalent compounds are neutral</i>	1	
		(ii)	1. Suhu yang tinggi diperlukan untuk mengatasi daya tarikan (elektrostatik) yang kuat antara ion-ion dalam natrium klorida / NaCl. <i>High temperature is required to overcome the strong (electrostatic) forces of attraction between ions in sodium chloride / NaCl.</i>	1	2
			2. Suhu yang rendah diperlukan untuk mengatasi daya tarikan antara molekul yang lemah dalam naftalena / C ₁₀ H ₈ . <i>Low temperature is required to overcome the weak forces of attraction between molecules in naphthalene / C₁₀H₈.</i>	1	
			Jumlah		7

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah
5	(a)	(i)	ZnCO ₃	1	1
		(ii)	(Gas) karbon dioksida <i>Carbon dioxide (gas)</i> r : CO ₂	1	1
		(iii)	ZnCO ₃ → ZnO + CO ₂	1	1
		(iv)	1. Bilangan mol ZnCO ₃ / <i>No of mole of ZnCO₃</i> = 25.0 / 125 // 0.2 (mol) 2. Nisbah mol 1 mol ZnCO ₃ : 1 mol CO ₂ // 0.2 mol ZnCO ₃ : 0.2 mol CO ₂ 3. Isipadu / <i>Volume CO₂</i> = 0.2 X 24 dm ³ // 4.8 dm ³	1 1 1	 3
	(b)	(i)	Warna kertas litmus biru lembap bertukar menjadi merah. <i>Blue colour of moist litmus paper turn red.</i>	1	1
		(ii)	Ion nitrat / <i>Nitrate ion</i> / NO ₃ ⁻	1	1
			Jumlah		8

Nombor Soalan			Cadangan Jawapan	Sub Markah	Jumlah Markah
6	(a)	(i)	air / <i>water</i> r : H ₂ O	1	1
		(ii)	(Ion) H ⁺ hadir H ⁺ (<i>ion</i>) present	1	1
	(b)	(i)	Tambah / larutkan / tuang / letak serbuk soda penaik / air kapur / CaO / CaCO ₃ <i>Add / dissolve / pour / put baking soda powder / lime water / CaO / CaCO₃</i>	1	1
(ii)		Neutralkan air berasid <i>Neutralise the acidic water</i>	1	1	
(iii)		Semakin tinggi kepekatan ion hidrogen / H ⁺ semakin rendah nilai pH <i>The higher the concentration of hydrogen ion / H⁺ the lower the pH value //</i> Semakin rendah kepekatan ion hidrogen / H ⁺ semakin tinggi nilai pH <i>The lower the concentration of hydrogen ion / H⁺ the higher the pH value</i>	1	1	
(c)	(i)	1. Bilangan mol HCl / <i>Number of mole of HCl</i> = (1.0)(20)/1000 // 0.04 (mol)	1	2	
		2. Kemolaran NaOH // <i>Molarity NaOH</i> = (0.04)(1000)/20 mol dm ⁻³ // 2.0 mol dm ⁻³	1		
		(ii)	1. 40 cm ³ 2. Asid sulfurik ialah asid diprotik <i>Sulphuric acid is diprotic acid //</i> Bilangan ion hidrogen / H ⁺ dalam satu molekul asid sulfurik ialah dua kali ganda lebih banyak (berbanding asid hidroklorik / HCl) The number of hydrogen ion / H ⁺ in one molecule of sulphuric acid is two times more (than hydrochloric acid / HCl)	1 1	2
			Jumlah		9

7	(a)	(i)	1. Situasi / <i>Situation II</i> 2. Air laut / Air liat mengandungi (ion) Ca^{2+} / Mg^{2+} <i>Sea water / Hard water contains Ca^{2+} / Mg^{2+} (ion)</i> 3. Anion sabun bertindak balas dengan (ion) Ca^{2+} / Mg^{2+} membentuk kekat / mendakan / garam tak terlarutkan <i>Anion of soap reacts with Ca^{2+} / Mg^{2+} (ion) to produce scum / precipitate / insoluble salt</i>	1	
		(ii)	Sabun / <i>Soap</i>	1	1
	(b)		1. Nama ubat : Lidah buaya / <i>Aloe Vera</i> [mana-mana dua kelebihan / any two benefits] 2. Diperoleh daripada tumbuhan / Mudah diperolehi <i>Obtained from plant / Easy to obtain</i> 3. Kos yang murah <i>Low cost</i> 4. Tidak mengandungi bahan kimia berbahaya <i>Not containing hazardous chemicals</i>	1	
				1	
				1	
	(c)		1. Menggunakan sel / panel solar <i>Use solar cells / panels</i> 2. Sel solar lebih kecil dan lebih efisien <i>Solar cells are smaller and more efficient</i> 3. Bateri sel solar tahan lebih lama <i>Solar cells batteries is long-lasting</i>	1	
				1	3
			Jumlah		10

8	(a)	<p>[Mana-mana dua jawapan / Any two answers]</p> <p>Suhu / <i>Temperature</i></p> <p>Size of reactant / <i>Saiz bahan tidak balas</i></p> <p>Kehadiran mangkin (<i>kuprum(II) sulfat / CuSO₄</i>) / <i>Presence of catalyst (copper(II) sulphate / CuSO₄)</i></p> <p>r : Kepekatan HCl / <i>Concentration of HCl</i></p>	1		
			1		
			1	Max. 2	
	(b)	<p>Isipadu gas hidrogen terkumpul</p> <p><i>Volume of hydrogen gas collected</i></p>	1	1	
	(c)	<p>$Zn + 2HCl \rightarrow ZnCl_2 + H_2$</p>	1	1	
	(d)	<p>Kadar tindak balas purata Set I // <i>Average rate of reaction in Set I</i></p> <p>= <u>50 cm³</u> // <u>50 cm³</u> // <u>50cm³</u></p> <p>50 s 50 saat 50 second</p> <p>= 1 cm³ s⁻¹ // 1cm³ saat⁻¹ // 1cm³ second⁻¹</p> <p>Kadar tindak balas purata Set II // <i>Average rate of reaction in Set II</i></p> <p>= <u>50 cm³</u> // <u>50 cm³</u> // <u>50 cm³</u></p> <p>30 s 30 saat 30 second</p> <p>= 1.667cm³ s⁻¹ // 1.667 cm³ saat⁻¹ // 1.667 cm³ second⁻¹</p>	1	1	
	(e)	(i)	<p>Kadar tindak balas bagi Set II lebih tinggi berbanding Set I</p> <p><i>The rate of reaction in Set II is higher than Set I</i></p>	1	1
		(ii)	<p>1. Suhu tindak balas bagi Set II lebih tinggi berbanding Set I</p> <p><i>Temperature reaction for Set II is higher than that Set I //</i></p> <p>Tenaga kinetik ion hidrogen bagi Set II lebih tinggi berbanding Set I</p> <p><i>The kinetic energy of hydrogen ion in Set II is higher than Set I</i></p> <p>2. Frekuensi perlanggaran berkesan antara ion hidrogen / H⁺ dan (atom) zink / Zn dalam Set II lebih tinggi berbanding Set I //</p> <p><i>Frequency of effective collision between hydrogen ions / H⁺ and zinc (atom) / Zn in Set II is higher than Set I.</i></p>	1	2
	(f)	<p>1. Tidak / <i>No</i></p> <p>2. Asid etanoik ialah asid lemah yang mengion separa dalam air</p> <p><i>Ethanoic acid is a weak acid which ionises partially in water //</i></p> <p>Kepekatan ion hidrogen / H⁺ asid etanoik lebih rendah (berbanding asid hidroklorik)</p> <p><i>Concentration of hydrogen ion / H⁺ is lower (compared to hydrochloric acid)</i></p>	1	2	
		Jumlah		10	

9	(a)	(i)	1. Tindak balas kimia yang melibatkan pengoksidaan dan peurunan berlaku secara serentak. <i>Chemical reaction where oxidation and reduction occur simultaneously.</i>	1	2												
			2. Hijau / <i>Green</i>	1													
		(ii)	1. Y : bromin / klorin / Br ₂ / Cl ₂ / <i>bromine / chlorine</i>	1	6												
			2. Kation / <i>Cation</i> : Fe ³⁺	1													
			3. Ion ferum(II) / Fe ²⁺ / Ferum(II) sulfat / FeSO ₄ mengalami pengoksidaan <i>Iron(II) ion / Fe²⁺ / iron(II) sulphate / FeSO₄ undergoes oxidation</i>	1													
			4. Ion ferum(II) / Fe ²⁺ / Ferum(II) sulfat / FeSO ₄ kehilangan elektron <i>Iron(II) ion / Fe²⁺ / iron(II) sulphate / FeSO₄ loses electron //</i> Nombor pengoksidaan ferum / Fe bertambah dari +2 ke +3 <i>Oxidation number of iron increases from +2 to +3</i>	1													
			5. Bromin mengalami penurunan. <i>Bromine undergoes reduction.</i>	1													
			6. Bromin / Br ₂ menerima elektron <i>Bromine / Br₂ gains electron //</i> Nombor pengoksidaan bromin / Br berkurang dari 0 ke -1 <i>Oxidation number of bromine decreases from 0 to -1</i>	1													
		(iii)	1. X : Magnesium / Mg // Zink / Zinc / Zn // Aluminium / Al	1	5												
			2. Mg + FeSO ₄ → MgSO ₄ + Fe	1													
			3. Bilangan mol ferum(II) sulfat / <i>Number of mol of iron(II) sulphate</i> $= \frac{50 \times 2.0}{1000} = 0.1$	1													
			4. Nisbah mol / <i>Mole ratio</i> 1 mol FeSO ₄ : 1 mol Fe // 0.1 mol FeSO ₄ : 0.1 mol Fe	1													
			5. Jisim ferum / <i>Mass of iron</i> $= 0.1 \times 56 \text{ g} // 5.6 \text{ g}$	1													
	(b)		1. W : klorin / Cl ₂ / <i>chlorine</i>	1	4												
			2. (Ion) Cl ⁻ dinyahcas <i>Cl⁻ (ion) discharged</i>	1													
			3. Kepekatan (ion) Cl ⁻ lebih tinggi daripada ion OH ⁻ <i>Concentration of Cl⁻ (ion) is higher than OH⁻ (ion)</i>	1													
			4. 2Cl ⁻ → Cl ₂ + 2e	1													
	(c)		[mesti ada perbandingan // <i>must have comparison</i>]		3												
			<table border="1"> <thead> <tr> <th></th> <th>Set I</th> <th>Set II</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Paku besi berkarat. <i>Iron nail rusts.</i></td> <td>Paku besi tidak berkarat. <i>Iron nail does not rust.</i></td> </tr> <tr> <td>2.</td> <td>Ion Fe²⁺ dihasilkan <i>Fe²⁺ ion is formed //</i> Fe → Fe²⁺ + 2e</td> <td>Tiada ion Fe²⁺ <i>Fe²⁺ ion does not form</i></td> </tr> <tr> <td>3.</td> <td>P kurang elektropositif daripada besi. <i>P less electropositive than iron.</i></td> <td>Q lebih elektropositif daripada besi. <i>Q is more electropositive than iron.</i></td> </tr> </tbody> </table>			Set I	Set II	1.	Paku besi berkarat. <i>Iron nail rusts.</i>	Paku besi tidak berkarat. <i>Iron nail does not rust.</i>	2.	Ion Fe ²⁺ dihasilkan <i>Fe²⁺ ion is formed //</i> Fe → Fe ²⁺ + 2e	Tiada ion Fe ²⁺ <i>Fe²⁺ ion does not form</i>	3.	P kurang elektropositif daripada besi. <i>P less electropositive than iron.</i>	Q lebih elektropositif daripada besi. <i>Q is more electropositive than iron.</i>	1
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				1													
				1													

			Jumlah		20
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10	(a)	[P3, P4, P5 mesti ada perbandingan // P3, P4, P5 <i>must have comparison</i>]				
		Gambar rajah aras tenaga A <i>Energy level diagram A</i>	Gambar rajah aras tenaga B <i>Energy level diagram B</i>			
		1. Tindak balas eksotermik <i>Exothermic reaction</i>	2. Tindak balas endotermik <i>Endothermic reaction</i>	1 + 1		
		3. Suhu tindak balas meningkat <i>Temperature of reaction increases</i>	Suhu tindak balas menurun <i>Temperature of reaction decreases</i>	1		
		4. Kandungan tenaga bahan tindak balas lebih tinggi daripada hasil tindak balas. <i>Energy content of reactants is higher than energy content of products.</i>	Kandungan tenaga bahan tindak balas lebih rendah daripada hasil tindak balas. <i>Energy content of reactants is lower than energy content of products.</i>	1		
		5. Tenaga haba dibebaskan sewaktu pembentukan ikatan lebih tinggi dari tenaga haba yang diserap sewaktu pemecahan ikatan <i>Heat energy releases during formation of bond is higher than heat energy absorbed during breaking of bond</i>	Tenaga haba diserap sewaktu pemecahan ikatan lebih tinggi dari tenaga haba yang dibebaskan sewaktu pembentukan ikatan <i>Heat energy absorbed during breaking of bond is higher than heat energy released during formation of bond</i>	1		
6. Peneutralan / <i>Neutralisation</i> // Penyesaran logam / <i>Displacement of metal</i>	7. Penguraian oleh haba <i>Decomposition</i>	1 + 1	7			
	(b)	(i)	Haba peneutralan ialah perubahan haba apabila 1 mol air terbentuk daripada tindak balas antara asid / HCl dan alkali / NaOH. <i>Heat of neutralisation is a heat change when 1 mol of water is formed from the reaction between an acid / HCl and an alkali / NaOH.</i>	1	1	
		(ii)	1. Bilangan mol / <i>Number of mole</i> $x = MV / 1000$ $= (1)(50) / 1000 // 0.05 \text{ (mol)}$ 2. Perubahan suhu / <i>temperature change</i> $\theta = 35.5 - 29.0 // 6.5^\circ\text{C}$ 3. Jisim / <i>mass</i> $m = (50 + 50)\text{cm}^3 \times 1 \text{ g cm}^{-3} // 100\text{g}$ 4. Perubahan haba / <i>heat change</i> $H = mc\theta$ $= 100 \times 4.2 \times 6.5 // 2730 \text{ J}$ 5. Haba peneutralan / <i>heat of neutralisation</i> $\Delta H = - H/x$	1 1 1 1		

		$= -2730 / 0.05$ $= -54600 \text{ J mol}^{-1}$ $= -54.6 \text{ kJ mol}^{-1}$	1	
		(iii) Haba terbebas ke persekitaran <i>Heat lost to the surroundings //</i> Haba diserap oleh radas eksperimen. <i>Heat is absorbed by the apparatus of the experiment</i>	1	6
		(iv) 1. Anak panah ke atas berlabel 'Tenaga' & dua aras <i>Arrow upward with 'Energy' labelled & two levels</i> 2. Bahan dan hasil tindak balas pada aras yang betul & ΔH <i>Reactants and products on the correct level & ΔH</i> *ecf ΔH daripada P6 10(b)(ii)	1	
			1	2
		(v) 1. Nilai haba peneutralan lebih rendah. <i>Heat of neutralisation is lower</i> 2. Ammonia adalah alkali lemah, ia mengion separa di dalam air dan sebahagiannya kekal sebagai molekul. <i>Ammonia is a weak alkali, it ionises partially in water and some remain as molecules.</i> 3. Sebahagian haba yang dibebaskan semasa peneutralan diserap dan digunakan untuk mengion molekul ammonia dengan lengkap di dalam air. <i>Some of the heat released during neutralisation is absorbed and used to completely ionise the weak alkali in water.</i>	1	
			1	
			1	
			1	3
		Jumlah		20

11	(a)	(i)	Kumpulan sebatian organik yang mempunyai kumpulan berfungsi yang sama dan diwakili oleh satu formula am. <i>A group of organic compounds which has the same functional group and is represented by a general formula.</i>	1	1															
		(ii)	[JMR / RMM = 28 // 42 // 56] <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">JMR / RMM = 28</th> <th style="width: 33%;">JMR / RMM = 42</th> <th style="width: 33%;">JMR / RMM = 56</th> </tr> </thead> <tbody> <tr> <td>1. $C_nH_{2n} = 28 //$ $12n + 2n = 28 //$ $n = 2$</td> <td>$C_nH_{2n} = 42 //$ $12n + 2n = 42 //$ $n = 3$</td> <td>$C_nH_{2n} = 56 //$ $12n + 2n = 56 //$ $n = 4$</td> </tr> <tr> <td>2. C_2H_4</td> <td>C_3H_6</td> <td>C_4H_8</td> </tr> <tr> <td>3. Etena / <i>Ethene</i></td> <td>Propena / <i>Propene</i></td> <td>Butena / <i>Butene</i></td> </tr> </tbody> </table>	JMR / RMM = 28	JMR / RMM = 42	JMR / RMM = 56	1. $C_nH_{2n} = 28 //$ $12n + 2n = 28 //$ $n = 2$	$C_nH_{2n} = 42 //$ $12n + 2n = 42 //$ $n = 3$	$C_nH_{2n} = 56 //$ $12n + 2n = 56 //$ $n = 4$	2. C_2H_4	C_3H_6	C_4H_8	3. Etena / <i>Ethene</i>	Propena / <i>Propene</i>	Butena / <i>Butene</i>	1 1 1	3			
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2. C_2H_4	C_3H_6	C_4H_8																		
3. Etena / <i>Ethene</i>	Propena / <i>Propene</i>	Butena / <i>Butene</i>																		
		(iii)	[n = 2 // n = 3 // n = 4] <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">n = 2</th> <th style="width: 33%;">n = 3</th> <th style="width: 33%;">n = 4</th> </tr> </thead> <tbody> <tr> <td>1. W : Etanol / <i>Ethanol</i></td> <td>W : Propanol</td> <td>W : Butanol</td> </tr> <tr> <td style="text-align: center;"> $\begin{array}{cc} H & H \\ & \\ H - C - C - OH \\ & \\ H & H \end{array}$ </td> <td style="text-align: center;"> $\begin{array}{ccc} H & H & H \\ & & \\ H - C - C - C - OH \\ & & \\ H & H & H \end{array}$ </td> <td style="text-align: center;"> $\begin{array}{cccc} H & H & H & H \\ & & & \\ H - C - C - C - C - OH \\ & & & \\ H & H & H & H \end{array}$ </td> </tr> <tr> <td>3. X : Asid etanoik / <i>Ethanoic acid</i></td> <td>X : Asid propanoik / <i>Propanoic acid</i></td> <td>X : Asid butanoik / <i>Butanoic acid</i></td> </tr> <tr> <td style="text-align: center;"> $\begin{array}{cc} H & O \\ & \\ H - C - C - OH \\ \\ H \end{array}$ </td> <td style="text-align: center;"> $\begin{array}{ccc} H & H & O \\ & & \\ H - C - C - C - OH \\ & \\ H & H \end{array}$ </td> <td style="text-align: center;"> $\begin{array}{cccc} H & H & H & O \\ & & & \\ H - C - C - C - C - OH \\ & & \\ H & H & H \end{array}$ </td> </tr> </tbody> </table> <p>5. Formula bahan dan hasil tindak balas betul <i>Correct formulae of reactants and products</i></p> <p>6. Persamaan seimbang <i>Balanced equation</i> $C_2H_5OH + 2[O] \rightarrow CH_3COOH + H_2O //$ $C_3H_7OH + 2[O] \rightarrow C_2H_5COOH + H_2O //$ $C_4H_9OH + 2[O] \rightarrow C_3H_7COOH + H_2O$ </p>	n = 2	n = 3	n = 4	1. W : Etanol / <i>Ethanol</i>	W : Propanol	W : Butanol	$\begin{array}{cc} H & H \\ & \\ H - C - C - OH \\ & \\ H & H \end{array}$	$\begin{array}{ccc} H & H & H \\ & & \\ H - C - C - C - OH \\ & & \\ H & H & H \end{array}$	$\begin{array}{cccc} H & H & H & H \\ & & & \\ H - C - C - C - C - OH \\ & & & \\ H & H & H & H \end{array}$	3. X : Asid etanoik / <i>Ethanoic acid</i>	X : Asid propanoik / <i>Propanoic acid</i>	X : Asid butanoik / <i>Butanoic acid</i>	$\begin{array}{cc} H & O \\ & \\ H - C - C - OH \\ \\ H \end{array}$	$\begin{array}{ccc} H & H & O \\ & & \\ H - C - C - C - OH \\ & \\ H & H \end{array}$	$\begin{array}{cccc} H & H & H & O \\ & & & \\ H - C - C - C - C - OH \\ & & \\ H & H & H \end{array}$	1 1 1 1 1	6
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		(b)	1. Pentanol / <i>Pentanol</i> 2. Asid etanoik / <i>Ethanoic acid</i> 3. Tuang [3 – 10] cm ³ asid etanoik dan [3 – 10] cm ³ pentanol ke dalam tabung didih dan campurkan. <i>Pour [3 – 10] cm³ ethanoic acid and [3 – 10] cm³ pentanol into boiling tube and mix well.</i> [Jumlah isi padu maksimum tabung didih : 22 cm ³]	1 1 1	1															

			<p>4. Tambah dengan perlahan / [3 – 5] titis asid sulfurik pekat ke dalam campuran. <i>Add slowly / [3 – 5] drops of concentrated sulphuric acid into the mixture.</i></p> <p>5. Panaskan campuran dengan perlahan. <i>Heat gently / warm the mixture.</i></p> <p>6. Tuang campuran tersebut ke dalam bikar yang mengandungi air. <i>Pour the mixture into a beaker containing water.</i></p> <p>7. $\text{CH}_3\text{COOH} + \text{C}_5\text{H}_{11}\text{OH} \rightarrow \text{CH}_3\text{COOC}_5\text{H}_{11} + \text{H}_2\text{O}$</p>	1	
		(c)	<p>1. A</p> <p>2. Peratusan alkohol adalah lebih tinggi <i>Percentage of alcohol is higher</i></p> <p>3. Boleh membasmi kuman / bakteria dengan lebih baik <i>Can kill germs / bacteria better</i></p> <p>ATAU</p> <p>1. B</p> <p>2. Peratusan alkohol adalah lebih rendah <i>Percentage of alcohol is lower</i></p> <p>3. Kurang kerengsaan pada kulit // kurang bahaya pada kulit <i>Less irritation to the skin // less harmful to skin</i></p>	1 1 1 ATAU 1 1 1	3 ATAU 3
			Jumlah		20