

**MODUL PENINGKATAN AKADEMIK TINGKATAN 5
TAHUN 2021**

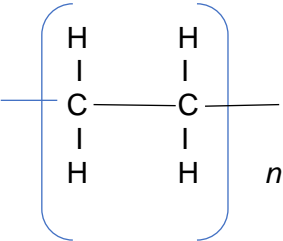
MODUL 2

CADANGAN PERATURAN PEMARKAHAN KIMIA

KERTAS 2


DUA JAM TIGA PULUH MINIT

Soalan/ Question 1	Jawapan Answer	Sub mark	Σ mark
(a)	Molekul <i>Molecule</i>	1	1
(b)	Haba diserap <i>Heat is absorb</i> Digunakan untuk mengatasi daya tarikan antara zarah <i>Is used to overcome the force of attraction between particles</i>	1 1	2
(c)	t ₃ s	1	1
(d)	Pepejal naftalena bertukar kepada gas <i>The naphthalene solid change to a gas</i>	1	1
TOTAL		5	

Soalan/ Question 2	Jawapan Answer	Sub mark	Σ mark
(a)	campuran dua atau lebih unsur yang mana unsur yang utama ialah logam <i>mixture of two or more elements which the main element is metal</i>	1	1
(b)(i)	keluli // steel	1	1
(ii)	aloi X lebih keras dari logam kuprum tulen// <i>alloy X is harder than pure copper metal</i>	1	1
(c)(i)	etena//ethene	1	1
(ii)		1	1
TOTAL		5	

Soalan/ Question 3	Jawapan Answer	Sub mark	Σmark
(a)	nombor proton// <i>proton number</i>	1	1
(b)	Z ⁺	1	1
(c)(i)	4Z + O ₂ → 2Z ₂ O Bahan dan Hasil betul// <i>Correct reactant and product</i>	1	2
	Seimbang Persamaan// <i>Balanced Equation</i>	1	
(ii)	4 mol Z → 2 mol Z ₂ O 0.05 mol : 0.025 mol	1	2
	<i>jisim</i> Z ₂ O = 0.025 X 30g // 0.75g	1	
TOTAL		6	

Soalan/ Question 4	Jawapan Answer	Sub mark	Σmark
(a)	Y dan V// Y dan W// Y dan X	1	1
(b) (i)	VW ₂	1	1
(b) (ii)	Ikatan kovalen// <i>Covalent bond</i>	1	1
(c)(i)	1. terdiri daripada molekul yang neutral <i>Exist as neutral molecules</i>	1	2
	2. tiada ion bebas bergerak // tidak boleh menghantarkan elektrik// <i>no free moving ions</i>	1	
(c)(ii)	1. Tidak// No	1	2
	2. Kerana air boleh menghantarkan elektrik// <i>because water can conduct electricity</i>	1	
TOTAL		7	

Soalan/ Question 5	Jawapan Answer	Sub mark	Σmark
(a)	Argentum nitrat// <i>silver nitrate</i>	1	1
(b)		1	1
(c)	Mass Ag = 36.1 – 25.3 = 10.8g Mol Ag = 10.8 / 108 = 0.1 mol Ag	1 1	2
(d)	Anod / Anod : $Ag \rightarrow Ag^+ + e^-$ katod / Cathode : $Ag^+ + e^- \rightarrow Ag$	1 1	2
(e)	Asid R : Sulphuric acid Asid M : Hydrochloric acid	1 1	2
	TOTAL		8

Soalan/ Question 6	Jawapan Answer	Sub mark	Σ mark
(a)	Haba penyesaran ialah haba yang dibebaskan apabila 1 mol logam argentum disesarkan daripada larutan argentum nitrat oleh logam kuprum <i>Heat of displacement is heat released when 1 mole of silver is displaced from silver nitrate by copper.</i>	1	1
(b)	Larutan tanpa warna berubah menjadi biru <i>Colorless solution turn to blue</i>	1	1
(c)	$\text{Cu} + \text{Ag}^+ \rightarrow \text{Cu}^{2+} + \text{Ag}$	1	1
(d)	(i) Bilangan mol <i>Number of mole</i> $n = \frac{MV}{1000}$ $(100 \times 0.2) / 1000$ $= 0.02 \text{ mol}$	1	3
	(ii) Haba dibebaskan, Q <i>Heat released</i> $1 \text{ mol} \rightarrow 105000 \text{ J}$ $0.02 \text{ mol} \rightarrow 2100 \text{ J}$ $Q = 2100 \text{ J}$	1	
	(iii) Perubahan suhu, θ <i>Heat change</i> $Q = mc\theta$ $2100 = (100)(4.2)\theta$ $\theta = 5^\circ\text{C}$	1	
e.	1. Dua kali ganda// <i>Doubled</i> // 10°C 2. kepekatan larutan argentum nitrat yang digunakan lebih tinggi.// <i>concentration of silver nitrate solution used is higher</i> 3. bilangan ion argentum per unit isipadu lebih tinggi maka haba yang dihasilkan lebih banyak// <i>number of silver ion per unit volume is higher, more heat is released</i>	1 1 1	3
TOTAL			9

Soalan/ Question 7	Jawapan Answer	Sub mark	Σ mark
a)	Kepekatan <i>Concentration</i>	1	1
b)	Isipadu gas karbon dioksida <i>Volume of carbon dioxide gas</i>	1	1
c)	$2\text{HCl} + \text{ZnCO}_3 \longrightarrow \text{ZnCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$ Betul bahan tindak balas dan hasil <i>Correct reactant and product</i> Betul seimbang persamaan <i>Correct balanced equation</i>	1 1	2
d)	Kadar tindak balas purata bagi set 1 <i>Average Rate of reaction for set 1</i> Kadar tindak balas purata = $\frac{\text{volume of gas}}{\text{time taken}}$ <i>Average rate of reaction</i> $= \frac{60 \text{ cm}^3}{180 \text{ s}}$ $= 0.33 \text{ cm}^3 \text{ s}^{-1}$	1	1
e)	Kadar tindak balas set II adalah lebih tinggi dari set I. <i>Rate of reaction for set II higher than set I</i> Kepekatan asid hidroklorik lebih tinggi dalam set II. <i>Concentration for hydrochloric acid in set II is higher</i> bilangan ion H ⁺ per unit isipadu lebih tinggi <i>number of hydrogen ion H⁺ per unit volume is higher</i>	1 1 1	3
f)	Ya betul. <i>Correct.</i> Ini disebabkan asid sulfurik ialah asid diprotik , walaupun kepekatan asid sama , kepekatan ion hidrogen dalam asid sulfurik adalah dua kali ganda berbanding asid hidroklorik maka kadar tindak balas lebih tinggi <i>Because sulphuric acid is diprotic acid , although has same concentration of acid , concentration of hydrogen ion in sulphuric acid is double compared to hydrochloric acid, so rate of reaction is higher</i>	1 1	2
	TOTAL		10

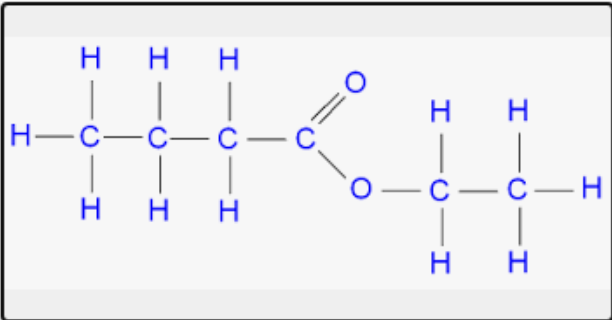
Soalan/ Question 8	Jawapan Answer	Sub mark	Σ mark
a	Saponifikasi <i>Saponification</i>	1	1
b	Kalium hidroksida <i>Potassium hydroxide</i>	1	1
c	$\text{CH}_3(\text{CH}_2)_{14}\text{COOH} + \text{NaOH} \rightarrow \text{CH}_3(\text{CH}_2)_{14}\text{COONa} + \text{H}_2\text{O}$ Bahan dan Hasil betul/ <i>Correct reactant and product</i> Seimbang Persamaan/ <i>Balanced Equation</i>	1 1	2
d	$0.05 \times 278 = 13.9\text{g}$	1	1
e	W kerana W tidak dapat membersihkan kotoran pada baju dalam air laut (air liat). <i>W because the dirt on the shirt remain when W used in hard water.</i> Kekat terbentuk. <i>Scum formed.</i>	1 1	2
f	Prosedur ujian 1. Masukkan 3 cm ³ larutan bikar P dan bikar Q ke dalam tabung uji berasingan yang mengandungi 5 cm ³ larutan kalsium nitrat 0.5 mol dm ⁻³ <i>Pour 3 cm³ of solution beaker P and Q into different test tube that containing 5 cm³ calcium nitrate solution 0.5 mol dm⁻³</i> 2. Tutup gabus getah di mulut tabung didih dan goncangkan. <i>Close the boiling tube with stopper and shake it</i> 3. Keputusan: Larutan dalam bikar yang menghasilkan kekat (mendakan putih) adalah sabun <i>Result: Solution in the beaker which can form scum or white precipitate is soap.</i>	1 1 1	3
TOTAL		10	

Soalan/ Question 9	Jawapan Answer	Sub mark	Σ mark												
(a)	<p>Answer :</p> <table border="1" data-bbox="363 327 1161 1200"> <thead> <tr> <th data-bbox="363 327 762 427">Bikar P <i>Beaker P</i></th> <th data-bbox="762 327 1161 427">Bikar Q <i>Beaker Q</i></th> </tr> </thead> <tbody> <tr> <td data-bbox="363 427 762 595">HA tidak mengion di dalam air <i>HA does not ionises in propanon</i></td> <td data-bbox="762 427 1161 595">HA mengion di dalam air <i>HA ionises in water</i></td> </tr> <tr> <td data-bbox="363 595 762 685">Tiada ion H⁺ terhasil <i>No H⁺ produces</i></td> <td data-bbox="762 595 1161 685">Tiada ion H⁺ terhasil <i>H⁺ ion produces</i></td> </tr> <tr> <td data-bbox="363 685 762 887">Gelembung gas tidak dihasilkan <i>No bubble gas released when CaCO₃ chips are added</i></td> <td data-bbox="762 685 1161 887">Gelembung gas tidak berwarna dihasilkan <i>Colourless bubble gas released when CaCO₃ chips are added</i></td> </tr> <tr> <td data-bbox="363 887 762 1055">Tiada gas karbon dioksida yang dibebaskan <i>Carbon dioxide gas is not released</i></td> <td data-bbox="762 887 1161 1055">Gas karbon dioksida yang dibebaskan <i>Carbon dioxide gas is released</i></td> </tr> <tr> <td data-bbox="363 1055 762 1200">HA tidak menunjukkan sifat asid <i>HA does not show acidic properties</i></td> <td data-bbox="762 1055 1161 1200">HA menunjukkan sifat asid <i>HA shows acidic properties</i></td> </tr> </tbody> </table>	Bikar P <i>Beaker P</i>	Bikar Q <i>Beaker Q</i>	HA tidak mengion di dalam air <i>HA does not ionises in propanon</i>	HA mengion di dalam air <i>HA ionises in water</i>	Tiada ion H ⁺ terhasil <i>No H⁺ produces</i>	Tiada ion H ⁺ terhasil <i>H⁺ ion produces</i>	Gelembung gas tidak dihasilkan <i>No bubble gas released when CaCO₃ chips are added</i>	Gelembung gas tidak berwarna dihasilkan <i>Colourless bubble gas released when CaCO₃ chips are added</i>	Tiada gas karbon dioksida yang dibebaskan <i>Carbon dioxide gas is not released</i>	Gas karbon dioksida yang dibebaskan <i>Carbon dioxide gas is released</i>	HA tidak menunjukkan sifat asid <i>HA does not show acidic properties</i>	HA menunjukkan sifat asid <i>HA shows acidic properties</i>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>5</p>
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b(i)	<p>HA : asid hidroklorik//<i>hydrochloric acid</i> *</p> <p>HB : asid etanoik// <i>Ethanoic acid</i>*</p> <p>X : pH 2</p> <p>HA adalah asid kuat manakala HB adalah asid lemah <i>HA is strong acid while HB is weak acid</i></p> <p>HA mengion dengan lengkap dalam air manakala HB mengion separa dalam air <i>HA ionises completely in water while HB ionises partially in water</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>5</p>												
b(ii)	<p>Proses pencairan// <i>Dilution</i></p> <p>Nilai pH semakin meningkat// <i>pH value will increases</i></p> <p>Kepekatan ion H⁺ semakin berkurang <i>Concentration of H⁺ decreases</i></p>	<p>1</p> <p>1</p> <p>1</p>	<p>3</p>												

(c)	<p>Penguraian ganda dua// <i>Double decomposition</i></p> $\text{CuCl}_2 + \text{Na}_2\text{CO}_3 \rightarrow \text{CuCO}_3 + 2\text{NaCl}$ <p>Bahan dan Hasil betul/ <i>Correct reactant and product</i></p> <p>Seimbang Persamaan/ <i>Balanced Equation</i></p> <p>Bilangan mol</p> $n = \frac{0.5(25)}{1000} // 0.0125\text{mol}$ <p>1 mol CuCl_2 : 1 mol CuCO_3 0.0125 mol CuCl_2 : 0.0125 mol CuCO_3</p> <p>Jisim $0.0125 \times 124 = 1.55\text{g}$</p> <p>Cadangan bahan : larutan kuprum(II) sulfat <i>Suggestion substance : copper(II) sulphate solution</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>7</p>
	TOTAL	20	

Soalan/ Question 10	Jawapan Answer	Sub mark	Σmark
10 (a)	Chemical reaction involving oxidation and reduction occurring simultaneously Not a redox reaction Oxidation number of each element before and after the reaction unchanged Oxidation number of Ag before and after the reaction is +1 Oxidation number of Na before and after the reaction is +1 Oxidation number of Cl before and after the reaction is -1 Oxidation number of O before and after the reaction is -2 Oxidation number of N before and after the reaction is +5	1 1 1 1	4
(b)(i)	Number of mole of Fe ₂ O ₃ $\frac{800\,000}{160} = 5000 \text{ mol}$ Mole ratio 2 mol of Fe ₂ O ₃ produces 4 mol of Fe 5000 mol of Fe ₂ O ₃ produces 10 000 mol of Fe Mass of Fe = 10 000 x 56 = 560 000 g (answer with correct unit)*	1 1 1 1	4
(ii)	+3 Iron(III) oxide	1 1	2
(c)	Metal P: Zn//Mg [Any suitable metal more electropositive than Fe] Metal Q: Cu//Ag [Any suitable metal less electropositive than Fe] <u>Set I</u> 1. Metal Q is less electropositive than iron. 2. Iron is oxidized. 3. Fe ²⁺ ion present//Rusting occurs. 4. Fe → Fe ²⁺ + 2e <u>Set II</u> 5. Metal P is more electropositive than iron. 6. Zinc is oxidized. 7. Hydroxide ion OH ⁻ present.//Rusting does not occur. 8. Zn → Zn ²⁺ + 2e	1 1 1 1 1 1 1 1	10
	TOTAL		20

Soalan/ Question 11	Jawapan Answer	Sub mark	Σ mark
(a)(i)	1. formula am//general formula X =C _n H _{2n+1} OH 2. X= etanol//ethanol 3. Y=butanol//butanol 4. Z=asid butanoik//butanoic acid	1 1 1 1	4
(ii)	1.Masukkan 2 cm ³ X ke dalam tabung didih <i>Pour 2 cm³ X into a boiling tube.</i> 2. Masukkan 2 cm ³ Z ke dalam tabung didih tersebut <i>Pour 2 cm³ Z into a boiling tube</i> 3.Tambahkan 3 titik asid sulfurik pekat ke dalam tabung didih itu. <i>Add 3 drops of concentrated sulphuric acid into the boiling tube</i> 4.Campuran digoncang <i>Mixture is shaken</i> 5.Campuran dipanaskan dengan perlahan-lahan <i>Mixture is heated gently</i> 6.Tuang campuran ke atas air dalam bikar <i>Pour the mixture onto water in a beaker</i> 7. formula bahan betul//correct formula of reactant 8. formula hasil betul// correct formula of product $\text{C}_2\text{H}_5\text{OH} + \text{C}_3\text{H}_7\text{COOH} \rightarrow \text{C}_3\text{H}_7\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$	1 1 1 1 1 1 1	8

(iii)	<p>1. karboksilat // <i>carboxylate</i></p> <p>2.</p> <div style="text-align: center;">  </div> <p>3. 1 mol X :1 mol ester // 0.03 mol X : 0.03 mol ester</p> <p>4. jisim//mass ester = 0.03 x 116 g// 3.48 g</p>	1 1 1	4										
(b)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"><i>Setuju //agree</i></th> <th style="width: 50%;"><i>Tidak setuju//disagree</i></th> </tr> </thead> <tbody> <tr> <td>Kandungan minyak tak tepu lebih tinggi dalam minyak B <i>Oil B contain more unsaturated fat</i></td> <td>Kandungan minyak tepu lebih banyak dalam minyak A <i>Oil A contain more saturated fat</i></td> </tr> <tr> <td>Mengurangkan penambahan kolesterol dalam darah <i>Reduce the increase of cholesterol in blood</i></td> <td>kurang menghasilkan bahan karsinogen <i>produce less carcinogen substances</i></td> </tr> <tr> <td>Tidak mudah mendapat penyakit jantung/obesity <i>Difficult to get heart disease/obesity</i></td> <td>Risiko kanser rendah <i>Less cancer risk</i></td> </tr> <tr> <td colspan="2"><i>[terima alasan lain yang logik]</i></td> </tr> </tbody> </table>	<i>Setuju //agree</i>	<i>Tidak setuju//disagree</i>	Kandungan minyak tak tepu lebih tinggi dalam minyak B <i>Oil B contain more unsaturated fat</i>	Kandungan minyak tepu lebih banyak dalam minyak A <i>Oil A contain more saturated fat</i>	Mengurangkan penambahan kolesterol dalam darah <i>Reduce the increase of cholesterol in blood</i>	kurang menghasilkan bahan karsinogen <i>produce less carcinogen substances</i>	Tidak mudah mendapat penyakit jantung/obesity <i>Difficult to get heart disease/obesity</i>	Risiko kanser rendah <i>Less cancer risk</i>	<i>[terima alasan lain yang logik]</i>		1 1 1 1	4
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TOTAL		20											

SKEMA PEMARKAHAN TAMAT
END OF MARK SCHEME