



MODUL PINTAS 2020
TINGKATAN 5

4541/3

KIMIA
Kertas 3
September/Oktober

$1\frac{1}{2}$ jam

Satu jam tiga puluh minit

PERATURAN PEMARKAHAN

KIMIA K3

4541/3

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (a)	Able to write all the volumes with units accurately Initial burette readings: 0.80 cm ³ , 13.40 cm ³ , 25.90 cm ³ <i>Bacaan awal buret: 0.80 cm³, 13.40 cm³, 25.90 cm³</i> Final burette readings: 13.40 cm ³ , 25.90 cm ³ , 38.40 cm ³ <i>Bacaan akhir buret: 13.40 cm³, 25.90 cm³, 38.40 cm³</i>	3
	Able to record all the volumes accurately but without units / one decimal place Initial burette readings: 0.8, 13.4, 25.9 <i>Bacaan awal buret: 0.8, 13.4, 25.9</i> Final burette readings : 13.4, 25.9, 38.4 <i>Bacaan akhir buret: 13.4, 25.9, 38.4</i>	2
	Able to write at least four readings of the volumes accurately	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>																
1 (b)	Able to construct a table correctly containing three labeled columns with correct units and record all the burette readings and volume of acids used accurately <u>Sample answer</u> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Titration no. <i>No. titratan</i></th> <th style="width: 25%;">I</th> <th style="width: 25%;">II</th> <th style="width: 25%;">III</th> </tr> </thead> <tbody> <tr> <td>Initial burette reading/cm³ <i>Bacaan awal buret/cm³</i></td> <td>0.80</td> <td>13.40</td> <td>25.90</td> </tr> <tr> <td>Final burette reading/cm³ <i>Bacaan akhir buret/cm³</i></td> <td>13.40</td> <td>25.90</td> <td>38.40</td> </tr> <tr> <td>Volume of acid used/cm³ <i>Isipadu asid digunakan/cm³</i></td> <td>12.60</td> <td>12.50</td> <td>12.50</td> </tr> </tbody> </table>	Titration no. <i>No. titratan</i>	I	II	III	Initial burette reading/cm ³ <i>Bacaan awal buret/cm³</i>	0.80	13.40	25.90	Final burette reading/cm ³ <i>Bacaan akhir buret/cm³</i>	13.40	25.90	38.40	Volume of acid used/cm ³ <i>Isipadu asid digunakan/cm³</i>	12.60	12.50	12.50	3
	Titration no. <i>No. titratan</i>	I	II	III														
	Initial burette reading/cm ³ <i>Bacaan awal buret/cm³</i>	0.80	13.40	25.90														
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	Volume of acid used/cm ³ <i>Isipadu asid digunakan/cm³</i>	12.60	12.50	12.50														
Able to construct a table correctly containing three labeled columns without units/one decimal place and record all the volumes accurately	2																	
Able to construct a table with at least three labels and four correct readings	1																	
No response or wrong response	0																	

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (c)	Able to calculate the average volume of acid used correctly and with unit <u>Sample answer:</u> Volume of acid used = $\frac{12.60 + 12.50 + 12.50}{3} = 12.53 // 12.5 // 12.533 \text{ cm}^3$ <i>Isipadu asid digunakan</i> = $\frac{12.60 + 12.50 + 12.50}{3} = 12.53 // 12.5 // 12.533 \text{ cm}^3$	3
	Able to calculate the average volume correctly but without unit	2
	Able to show the calculation of average volume of acid used but incorrect answer	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (d)	Able to state the volume correctly 6.27 cm ³ // 6.25 cm ³	3
	Able to state the volume but to one decimal place 6.3 cm ³ // [6.0 – 7.0] cm ³	2
	Able to state the volume but inaccurately 12.5 cm ³ //25.0 cm ³	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (e)	<p>Able to classify the strong acids and the weak acids into their group the correctly</p> <p>Strong acids: hydrochloric acid, nitric acid <i>Asid kuat: asid hidroklorik, asid nitrik</i></p> <p>Weak acids: ethanoic acid, carbonic acid, phosphoric acid <i>Asid lemah: asid etanoik, asid karbonik, asid fosforik</i></p>	3
	<p>Able to classify the strong acids and the weak acids correctly but in opposite group</p> <p>Strong acids: ethanoic acid, carbonic acid <i>Asid kuat: Asid etanoik, asid karbonik</i></p> <p>Weak acids: hydrochloric acid, phosphoric acid, nitric acid <i>Asid lemah: Asid hidroklorik, asid fosforik, asid nitrik</i></p>	2
	Able to classify at least three acids into the correct group	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1(f)	<p>Able to calculate the concentration of sodium hydroxide solution that fulfills the following criteria:</p> <ol style="list-style-type: none"> 1. Correct number of mol of HCl <i>Bil mol HCl yang betul</i> 2. Correct mol ratio of acid and alkali <i>Nisbah mol asid dan alkali yang betul</i> 3. Correct answer with unit <i>Jawapan bersama unit yang betul</i> <p>Number of mol of HCl = $\frac{1.0 \times 12.5}{1000} = 0.0125$ mol <i>Bilangan mol HCl</i></p> <p>1 mol HCl : 1 mol NaOH 0.0125 mol HCl : 0.0125 mol NaOH</p> <p>$0.0125 \text{ mol} = \frac{M_{\text{NaOH}} \times 25.0}{1000}$</p> <p>$M_{\text{NaOH}} = 0.5 \text{ mol dm}^{-3}$</p>	3
	Able to fulfills the all criteria but answer without unit or able to fulfills any two of the criteria	2
	Able to fulfills any one of the criteria	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1(g)	<p>Able to give the operational definition accurately by stating the following two information.</p> <p>1. What should be done : Added to neutralize sodium hydroxide solution</p> <p>2. What should be observed: Phenolphthalein change from pink to colourless</p> <p><u>Sample answer:</u> Acid is the substance when added to neutralize sodium hydroxide solution, the phenolphthalein change from pink to colourless.</p>	3
	<p>Able to give the operational definition correctly by stating any one of the information above.</p> <p><u>Sample answer:</u> Acid is a substance that is added to neutralize sodium hydroxide solution</p> <p style="text-align: center;">Or</p> <p>Acid is a substance that changes the colour of phenolphthalein from pink to colourless.</p>	2
	<p>Able to give the operational definition correctly by giving an idea of the information above.</p> <p><u>Sample answer:</u> Acid neutralizes the alkali.</p> <p style="text-align: center;">Or</p> <p>Phenolphthalein change from pink to colourless.</p>	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (h)(i)	<p>Able to state the relationship between the manipulated variable and the responding variable and stating the direction correctly</p> <p><u>Sample answer</u> Presence of water acid, ethanoic acid will shows the acidic properties//absence of water, ethanoic acid does not show acidic properties. <i>Dengan kehadiran air, asid etanoik menunjukkan ciri-ciri asid// tanpa kehadiran air, asid etanoik tidak menunjukkan ciri-ciri asid.</i></p> <p>Note: RV-MV score 2</p>	3
	<p>Able to state the relationship between the manipulated variable and the responding variable but less accurate in stating the direction</p> <p><u>Sample answers</u> Acid ethanoic shows acidic property in water// Acidic property shown in the presence of water. <i>Asid etanoik menunjukkan ciri asid dalam air// Ciri keasidan ditunjukkan dengan kehadiran air.</i></p>	2
	<p>Able to give an idea of hypothesis</p> <p><u>Sample answer</u> Water changes the pH value// water shows acidic properties <i>Air mengubah nilai pH// air menunjukkan ciri-ciri asid</i></p>	1
	<p>No response or wrong response</p>	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
1 (h)(ii)	<p>Able to classify all the variables correctly.</p> <p><u>Sample answer</u></p> <p><u>(a) Manipulated variable:</u> <u>(a) <i>Pemboleh ubah dimanipulasikan:</i></u></p> <p>Presence of water// (Type of solvent)/ water and propanone // <i>Kehadiran hadir// (Jenis pelarut)/ air dan propanon//</i></p> <p><u>(b) Responding variable:</u> <u>(b) <i>Pemboleh ubah bergerak balas.</i></u></p> <p>Acidic properties//formation of bubbles//pH value <i>Ciri-ciri asid//pembentukan gelembung//nilai pH</i></p> <p><u>(c) Fixed variables:</u> <u>(c) <i>Pemboleh ubah dimalarkan :</i></u></p> <p>Acid//Type of acid//ethanoic acid <i>Asid// Jenis asid// asid etanoik</i></p>	3
	Able to state any 2 variables correctly	2
	Able to state any 1 variable correctly or any three ideas	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>		Mark <i>Markah</i>
1 (i)	Observation <i>Pemerhatin</i>	Inference <i>Inferens</i>	6
Gas bubbles formed//efferverscene <i>Gelembung gas terbentuk//Pembuakan</i>	Ethanoic acid shows acidic properties//carbon dioxide gas produced <i>Asid etanoik menunjukkan ciri-ciri asid//gas karbon dioksida dihasilkan</i>		
No gas bubbles formed//No efferverscene <i>Tiada gelembung gas terbentuk//Tiada pembuakan</i>	Ethanoic acid cannot shows acidic properties// No carbon dioxide gas <i>Asid etanoik tidak boleh menunjukkan ciri-ciri asid//Tiada gas karbon dioksida</i>		
pH value is 3 <i>Nilai pH ialah 3</i>	Ethanoic acid shows acidic properties <i>Asid etanoik menunjukkan ciri-ciri asid</i>		
<p>Able to state three different observations and three corresponding inferences correctly.</p> <p>* accept matching correct inference from less accurate observation.(e.g: colourless gas, air bubbles) * <i>terima inferens betul yang bersesuaian daripada pemerhatian yang kurang tepat. (cth: gas tanpa warna, gelembung udara)</i></p>			
Able to state any 5 observations and corresponding inferences correctly			5
Able to state any 4 observations and corresponding inferences correctly			4
Able to state any 3 observations and corresponding inferences correctly			3
Able to state any 2 observations and corresponding inferences correctly			2
Able to state any 1 observation or corresponding inference correctly or any three idea from observation or any three idea from inferences			1
No response or wrong response			0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
2 (a)	Able to state the problem statement of experiment correctly <u>Sample answer</u> To compare the hardness of copper and its alloy, bronze. <i>Untuk membandingkan kekerasan kuprum dan aloinya, gangsa.</i>	3
	Able to state the problem statement of experiment <u>Sample answer</u> Bronze is harder. <i>Gangsa lebih keras.</i>	2
	Able to state the problem statement of experiment correctly <u>Sample answer</u> To compare the hardness. <i>Untuk membandingkan kekerasan.</i>	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
2 (b)	Able to state the all the variables correctly <u>Sample answer</u> <u>Manipulated variables:</u> Type of block // Copper and bronze Jenis bongkah/blok // Kuprum dan gangsa <u>Responding variable:</u> Diameter of dent Diameter lekuk <u>Fixed variable:</u> (1 kg) / mass/ height of weight (1 kg) / jisim / ketinggian pemberat	3
	Able to state any two variables correctly	2
	Able to state any one variable correctly	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
2 (c)	<p>Able to state the relationship between the manipulated variable and the responding variable with directly correctly</p> <p><u>Sample answer</u> Bronze is harder than copper <i>Gangsa lebih keras dari kuprum</i></p>	3
	<p>Able to state the relationship between the manipulated variable and the responding variable less correctly</p> <p><u>Sample answer</u> Alloy of copper is harder than pure copper. <i>Aloi kuprum lebih keras dari kuprum tulen</i></p>	2
	<p>Able to state an idea of hypothesis</p> <p><u>Sample answer</u> (Type of alloy) / alloy / diameter of dent <i>(Jenis bongkah) / aloi / diameter lekuk</i></p>	1
	<p>No response or wrong response</p>	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
2 (d)	<p>Able to list all the materials and apparatus that involves the following:</p> <p><u>Materials // Bahan</u> 1. Bronze block / <i>Bongkah gangsa</i> 2. Copper block / <i>Bongkah kuprum</i></p> <p><u>Apparatus // Radas</u> 1. Weight / <i>Pemberat</i> 2. Thread / <i>Benang</i> 3. Metre rule / <i>Pembaris meter</i> 4. Steel ball bearing / <i>Bebola keluli</i> 5. Cellophane tape / <i>Pita selofan</i> 6. Retort stand with clamps / <i>Kaki retort dan pengapit</i></p>	3
	<p>Able to list all the materials and apparatus that involves the following:</p> <p><u>Materials // Bahan</u> 1. Bronze block / <i>Bongkah gangsa</i> 2. Copper block / <i>Bongkah kuprum</i></p> <p><u>Apparatus // Radas</u> 1. Weight / <i>Pemberat</i> 2. Thread / <i>Benang</i> 3. Metre rule / <i>Pembaris meter</i> 4. Steel ball bearing / <i>Bebola keluli</i></p>	2
	<p>Able to list all the materials and apparatus that involves the following:</p> <p><u>Materials // Bahan</u> 1. Bronze block / <i>Bongkah gangsa</i> 2. Copper block / <i>Bongkah kuprum</i></p> <p><u>Apparatus // Radas</u> 1. Weight / <i>Pemberat</i> 2. Thread / <i>Benang</i> 3. Metre rule / <i>Pembaris meter</i></p>	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>
2 (e)	<p>Able to list all the steps of procedure correctly</p> <ol style="list-style-type: none"> 1. Stick the steel ball bearing on the bronze block with cellophane tape. 2. Hang a 1 kg weight at the height of 50 cm above the bronze block 3. Release the weight 4. Measure and record the diameter of the dent into a table. 5. Repeat the experiment twice on other parts of the block to get average reading 6. Repeat the experiment with copper block to substitute the bronze block. <ol style="list-style-type: none"> 1. <i>Lekatkan bebola keluli pada permukaan bongkah gangsa dengan pita selofan.</i> 2. <i>Gantungkan pemberat 1 kg setinggi 50 cm di atas bongkah gangsa.</i> 3. <i>Jatuhkan pemberat.</i> 4. <i>Ukur dan rekodkan diameter lekuk ke dalam jadual.</i> 5. <i>Ulang eksperimen dua kali pada permukaan yang lain untuk mendapatkan bacaan purata.</i> 6. <i>Ulang eksperimen dengan menggunakan bongkah kuprum menggantikan bongkah gangsa.</i> 	3
	Able to list steps 1 (atau 3), 4, 5, 6	2
	Able to list steps 1, 3, 5	1
	No response or wrong response	0

No	Mark Scheme <i>Skema markah</i>	Mark <i>Markah</i>																		
2(f)	<p>Able to tabulate the data with the consists of</p> <p>1. Heading for Manipulated variable</p> <p><u>Sample answer</u></p> <table border="1" data-bbox="343 421 1294 674"> <thead> <tr> <th data-bbox="343 421 663 524" rowspan="2">Block <i>Bongkah</i></th> <th colspan="3" data-bbox="663 421 1075 488">Diameter of dent / cm <i>Diameter lekuk / cm</i></th> <th data-bbox="1075 421 1294 524" rowspan="2">Average (cm) <i>Purata (cm)</i></th> </tr> <tr> <th data-bbox="663 488 810 524">1</th> <th data-bbox="810 488 941 524">2</th> <th data-bbox="941 488 1075 524">3</th> </tr> </thead> <tbody> <tr> <td data-bbox="343 524 663 600">Bronze <i>Gangsa</i></td> <td data-bbox="663 524 810 600"></td> <td data-bbox="810 524 941 600"></td> <td data-bbox="941 524 1075 600"></td> <td data-bbox="1075 524 1294 600"></td> </tr> <tr> <td data-bbox="343 600 663 674">Copper <i>Kuprum</i></td> <td data-bbox="663 600 810 674"></td> <td data-bbox="810 600 941 674"></td> <td data-bbox="941 600 1075 674"></td> <td data-bbox="1075 600 1294 674"></td> </tr> </tbody> </table>	Block <i>Bongkah</i>	Diameter of dent / cm <i>Diameter lekuk / cm</i>			Average (cm) <i>Purata (cm)</i>	1	2	3	Bronze <i>Gangsa</i>					Copper <i>Kuprum</i>					2
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	No response or wrong response or empty table	0																		

END OF ANSWER SCHEME
SKEMA JAWAPAN TAMAT