PENTAKSIRAN DIAGNOSTIK AKADEMIK
SEKOLAH BERASRAMA PENUH 2019

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PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA **4541/1,2, 3**
CHEMISTRY
Kertas 1, 2, 3
Ogos 2019

MARKING SCHEME

PAPER 1, 2 & 3

MARKING SCHEME CHEMISTRY
PAPER 1

NO	ANSWER	NO	ANSWER
1	A	**26**	D
2	C	**27**	B
3	A	**28**	C
4	C	**29**	D
5	C	**30**	C
6	C	**31**	B
7	D	**32**	C
8	D	**33**	A
9	D	**34**	A
10	B	**35**	C
11	A	**36**	B
12	D	**37**	B
13	D	**38**	A
14	A	**39**	D
15	A	**40**	D
16	A	**41**	C
17	A	**42**	A
18	D	**43**	B
19	B	**44**	D
20	B	**45**	B
21	D	**46**	B
22	C	**47**	C
23	D	**48**	C
24	B	**49**	B
25	B	**50**	A

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SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

MARKING SCHEME CHEMISTRY
PAPER 2

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No			Mark Scheme	Sub Mark	Total mark
1	(a)	(i)	[Able to state the name of the process correctly] Answer : Haber Process // *Proses Haber*	1	1
		(ii)	[Able to write the chemical formula ammonia correctly] Answer : NH_3	1	1
		(iii)	[Able to state one condition correctly] Answer : 450^oC // 200 atm // iron // *ferum*	1	1
		(iv)	[Able to state the source of hydrogen correctly] Sample answer : Natural gas //methane // *Gas asli // metana*	1	1
	(b)	(i)	[Able to state cleaning agent produced by saponification process correctly] Answer : Cleaning agent A // *Agen pencuci* A	1	1
		(ii)	[Able to state which cleaning agent is more effective in hard water and give a reason correctly] Sample answer : 1. Cleaning agent B // *Agen pencuci B* 2. Do not form scum / precipitate // *Tidak menghasilkan kekat / mendakan*	1 1	2
		(iii)	[Able to state which cleaning agent is more environmentally friendly and give a reason correctly] Sample answer : 1. Cleaning agent A // *Agen pencuci A* 2. Biodegradable // Biological decomposed // *Terbiodegradasi* // *Terurai secara biologi*	1 1	2
			TOTAL		**9**

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No.			Mark Scheme	Sub Mark	Total mark
2	(a)		[Able to give the meaning of empirical formula correctly] Answer : Chemical formula that shows the simplest whole number ratio of the atoms of the elements in a compound // *Formula kimia yang menunjukkan nisbah teringkas atom unsur-unsur dalam satu sebatian.*	1	1
	(b)		[Able to state the type of particle for the product formed in the experiment correctly] Answer : Ions // *Ion*	1	1
	(c)		[Able to give the reason why crucible lid need to be opened in a while correctly] Answer : To allow oxygen to enter the crucible for combustion // *Membenarkan oksigen masuk ke dalam mangkuk pijar untuk pembakaran*	1	1
	(d)		[Able to calculate the number of mole of magnesium, mass of magnesium oxide and value of X correctly] 1. Mole of magnesium 2. Mass of magnesium oxide with correct unit 3. Value of X Sample answer : Mole of magnesium = $\frac{2.4}{24}$ // 0.1 Mass of MgO = 0.1 x 40 // 4 g Value of X = 21.6 + 4 = 25.6	1 1 1	3
	(e)		[Able to state how to ensure the reaction complete correctly] Answer : Repeat the process of heating, cooling and weighing until constant mass is obtained // *Ulang proses pemanasan, penyejukan dan penimbangan sehingga jisim tetap diperoleh.*	1	1
	(f)	(i)	[Able to determine whether the empirical formula of lead(II) oxide can be determined by using the same method correctly] Answer : Cannot // *Tidak boleh*	1	1
		(ii)	[Able to give the reason correctly] Answer : Lead is less reactive towards oxygen // *Plumbum kurang reaktif terhadap oksigen*	1	1
			TOTAL		**9**

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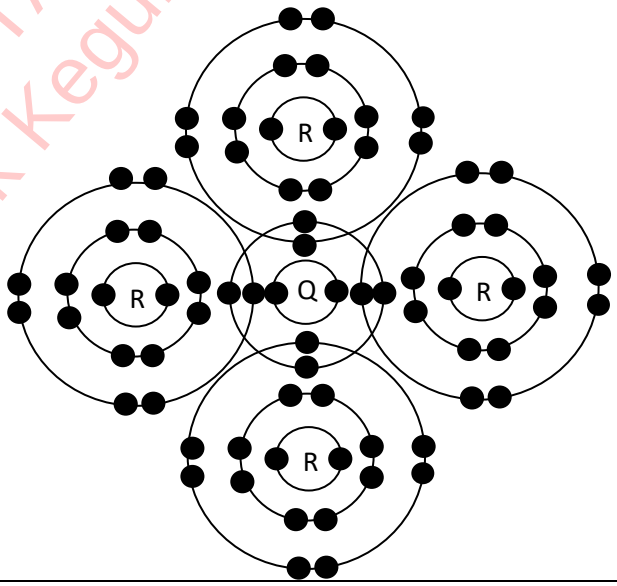
No.			Mark Scheme	Sub Mark	Total marks
3	(a)	(i)	[Able to state the type of bond in compound J correctly] Answer : Ionic bond // *Ikatan ion*	1	1
		(ii)	[Able to write the electron arrangement of atom X correctly] Answer : 2.8.2 / 2,8,2	1	1
		(iii)	[Able to write the chemical equation for the reaction between element X and element Y to form compound J correctly] Answer : $X + Y_2 \rightarrow XY_2$ // $Mg + Cl_2 \rightarrow MgCl_2$	1	1
	(b)	(i)	[Able to choose atoms that can react to form the same type of compound as solvent used in cosmetic and medical correctly] Answer : Q and R // Q *dan* R	1	1
		(ii)	[Able to write the chemical formula of the compound formed correctly] Answer : QR_4	1	1
		(iii)	[Able to draw the electron arrangement of the compound formed in **3**(b)(ii) correctly] 1. Correct number of atoms // *Bilangan atom yang betul* 2. Correct number of shells and electrons // *Bilangan petala dan elektron yang betul* 	1 1	2

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	(c)	[Able to explain why the melting point of compound J is higher than the compound formed in **3**(b)(i) correctly] Sample answer: 1. Compound J has strong electrostatic force between ions // *Sebatian* J *mempunyai daya elektrostatik yang kuat antara ion* 2. Compound in 3(b)(i) has weak intermolecular force // *Sebatian dalam* 3(b)(i) *mempunyai daya antara molekul yang lemah* 3. More heat energy is needed to overcome the forces in compound J // Less heat energy is needed to overcome the forces in compound 3(b)(i) // *Lebih banyak tenaga haba diperlukan untuk mengatasi daya dalam sebatian J // Kurang tenaga haba diperlukan untuk mengatasi daya tarikan dalam sebatian* 3(b)(i)	1 1 1	3
		TOTAL		**10**

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No				Mark Scheme	Sub Mark	Total marks
4	(a)			[Able to state one physical property of both elements X and Y correctly] Sample answer : Shiny surface // Low density // Low melting / boiling point // Conduct electricity / heat // exist as solid at room temperature *Permukaan berkilat // Ketumpatan yang rendah // Takat lebur / takat didih yang rendah // Mengkonduksi elektrik / haba //Wujud sebagai pepejal pada suhu bilik*	1	1
	(b)			[Able to determine whether element X show similar chemical properties as element Y and give a reason correctly] Sample answer : 1. Yes // *Ya* 2. Both elements have one valence electron // *Kedua-dua unsur mempunyai satu elektron valens*	1 1	2
	(c)	(i)		[Able to state one observation when element X **or** element Y is burnt in the oxygen correctly] Sample answer : Element X / Y burns brightly // Element X burns with a yellow flame // Element Y burns with a purple flame // white solid is formed *Unsur X / Y terbakar terang // Unsur X terbakar dengan nyalaan kuning // Unsur Y terbakar dengan nyalaan ungu // pepejal putih terbentuk*	1	1
		(ii)		[Able to compare the reactivity of element X and element Y towards oxygen correctly] Answer : Element Y / potassium is more reactive than element X / sodium // *Unsur Y / kalium lebih reaktif daripada unsur X / natrium*	1	1

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No			Mark Scheme	Sub Mark	Total marks
		(iii)	[Able to give the explanation correctly] Sample answer : 1. Atomic size of Y / potassium is bigger // Distance between nucleus and valence electron of atom Y / potassium is further than X / sodium // *Saiz atom Y / kalium lebih besar // Jarak antara nukleus dan elektron valens bagi atom Y / kalium lebih jauh dari X / natrium* 2. Force of attraction between nucleus and valence electron of atom Y / potassium is weaker // *Daya tarikan antara nukleus dan elektron valens atom Y / kalium lebih lemah* 3. Easier for atom Y / potassium to release its valence electron // *Lebih mudah bagi atom Y / kalium untuk melepaskan elektron valens*	1 1 1	3
		(iv)	[Able to write a chemical equation for the reaction between the product formed and water correctly] 1. Correct formulae of reactants and products // *Formula bahan dan hasil tindak balas yang betul* 2. Balanced equation // *Persamaan seimbang* Sample answer : $X_2O + H_2O \rightarrow 2XOH$ // $Na_2O + H_2O \rightarrow 2NaOH$	1 1	2
			TOTAL		**10**

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No			Mark Scheme	Sub Mark	Total marks
5	(a)	(i)	[Able to state the meaning of standard solution correctly] Answer: A solution in which its concentration is accurately known // *Larutan yang kepekatannya telah diketahui secara tepat*	1	1
		(ii)	[Able to state one chemical property of acid solution correctly] Sample answer: Reacts with metal to form salt and hydrogen gas // Reacts with metal oxide to form salt and water // Reacts with metal carbonate to form salt, water and carbon dioxide // React with alkali to form salt and water // *Bertindak balas dengan logam membentuk garam dan gas hidrogen // Bertindak balas dengan oksida logam membentuk garam dan air // Bertindak balas dengan logam karbonat membentuk garam, air dan gas karbon dioksida // Bertindak balas dengan alkali membentuk garam dan air*	1	1
		(iii)	[Able to state the type of particle of solvent used in Set B correctly] Answer: Molecule // *Molekul*	1	1

		(iv)	[Able to calculate the mass of lactic acid used to prepare solution in Set A correctly]
			
			1. Number of mole
			2. Correct molar mass of lactic acid
			3. Mass with correct unit
			
			Sample answer :
			Number of mole = (2.0)(0.5) // 1
			Molar mass of lactic acid = 3(12) + 6(1) + 3(16) // 90
			Mass = $\frac{1}{90}$ // 0.01 g
				1
				1
				1
					3

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No			Mark Scheme	Sub Mark	Total marks
	(b)	(i)	[Able to explain the difference in the observation for both sets of solutions correctly] Sample answer: 1. Reaction occurs in Set A but not in Set B // *Tindak balas berlaku dalam Set* A *tetapi tidak dalam Set* B 2. In Set A, acid ionises in water to form hydrogen ion / H^+ // *Dalam Set* A, a*sid mengion dalam air membentuk ion hidrogen* / H^+ 3. In Set B, acid does not ionises to form hydrogen ion / H^+ // Acid remains as molecules // *Dalam Set* B, *asid tidak mengion dalam air membentuk ion hidrogen* / H^+// *Asid kekal sebagai molekul*	 1 1 1	 3
		(ii)	[Able to describe briefly the chemical test for the gas released correctly] Answer: 1. Place a lighted wooden splinter at the mouth of the test tube containing the gas // *Letakkan kayu uji menyala pada mulut tabung uji yang mengandungi gas itu* 2. 'Pop' sound produced // *bunyi* 'pop' *terhasil*	 1 1	 2
			TOTAL		**11**

No			Mark Scheme	Sub Mark	Total marks
6	(a)		[Able to state the change of energy in Cell A correctly] Answer : Chemical energy to electrical energy // *tenaga kimia kepada tenaga elektrik*	 1	 1
	(b)		[Able to suggest the name of metals X and Y correctly] Sample answer : X – Iron // tin // lead // copper // silver // *Ferum // stanum // plumbum // kuprum // argentum* Y- Copper // *Kuprum*	 1 1	 2

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	(c)	(i)	[Able to determine the anode in Cell A correctly] Answer : Magnesium	1	1
		(ii)	[Able to give a reason for the answer correctly] Sample answer : Magnesium / Mg is more electropositive than metal X // position of magnesium / Mg is higher than metal X in electrochemical series // *Magnesium* / Mg *lebih elektropositif daripada logam* X // *kedudukan magnesium* / Mg *lebih tinggi daripada logam* X *dalam siri elektrokimia*	1	1
		(iii)	[Able to write the half-equation at metal X correctly] Answer : $2H^+ + 2e- \rightarrow H_2$	1	1
	(d)	(i)	[Able to state one information that can be obtained from the graph correctly] Sample answer : The concentration of $Y(NO_3)_2$ / Cu^{2+} ion remains unchanged. // *Kepekatan larutan* $Y(NO_3)_2$ / *ion* Cu^{2+} *tidak berubah.* **r**: gradient is zero// graph is constant	1	1
		(ii)	[Able to explain the information correctly] Answer : 1. The rate of formation of Cu^{2+} ion / ionisation of copper atom at the anode // *Kadar pembentukan* Cu^{2+} ion / *pengionan atom kuprum di anod* 2. is the same as the rate of discharge of Cu^{2+} ion at the cathode // *adalah sama dengan kadar nyahcas* Cu^{2+} *ion di katod*.	1 1	2
	(e)		[Able to suggest what should be done in the experiment without changing the solution used and give a reason for the formation of colourless gas correctly] Answer : 1. Replaced metal X with carbon / platinum / graphite // *Tukarkan logam X dengan karbon / platinum / grafit* 2. Hydroxide ion / OH^- selected to be discharged // *ion hidroksida* / OH^- *terpilih untuk dinyahcas*	1 1	2
			TOTAL		**11**

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No			Mark Scheme	Mark	Total marks
7	(a)		[Able to state coffee powder in which situation will dissolve faster and explain the answer correctly] Sample answer: 1. Coffee powder in hot water dissolves faster // *Serbuk kopi dalam air panas larut dengan lebih cepat* 2. Temperature of hot water is higher //*Suhu air dalam air panas lebih tinggi* 3. Kinetic energy of water particles in hot water is higher // *Tenaga kinetik zarah-zarah air dalam air panas adalah lebih tinggi*	 1 1 1	 3
	(b)	(i)	[Able to state all factors that affect the rate of reaction correctly] Answer: 1. Temperature // *suhu* 2. Concentration of solution // *kepekatan larutan*	 1 1	 2
		(ii)	[Able to write a balanced chemical equation correctly] 1. Correct formulae of reactants and products *Formula bahan dan hasil tindak balas yang betul* 2. Balanced equation *Persamaan seimbang* Answer: $CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$ [Able to calculate the volume of gas released correctly] 3. Number of mole // *bilangan mol* 4. Ratio of mole // *nisbah mol* 5. Correct volume of gas with unit // *isi padu gas yang betul berserta unit*	 1 1 1 1 1	 5

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
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			Sample answer: Number of mol of HCl = (100 x 0.5)/1000 = 0.05 2 mol HCl produces 1 mol CO_2 gas // 2 mol HCl *menghasilkan* 1 mol gas CO_2 // 0.05 mol HCl produces 0.025 mol CO_2 gas // 0.05 mol HCl *menghasilkan* 0.025 mol CO_2 Volume of CO_2 // *Isi padu gas* CO_2 = 0.025 x 24 = 0.6 dm^3 // 600 cm^3		
		(iii)	[Able to explain the rate of reaction using Collision Theory correctly] • Experiment I and II *Eksperimen* I *dan* II Sample answer : 1. Rate of reaction in Experiment II is higher than Experiment I // *Kadar tindak balas dalam Eksperimen* II *lebih tinggi berbanding Eksperimen* I 2. Concentration of hydrochloric acid in Experiment II is higher than Experiment I // *Kepekatan asid hidroklorik dalam Eksperimen* II *lebih tinggi berbanding Eksperimen* I 3. Number of hydrogen ions per unit volume in Experiment II is higher than in Experiment I // *Bilangan ion hidrogen per unit isi padu lebih tinggi dalam Eksperimen* II *berbanding Eksperimen* I 4. Frequency of collision between calcium carbonate and hydrogen ion is higher in Experiment II than Experiment I // *Frekuensi perlanggaran antara kalsium karbonat dan ion hidrogen lebih tinggi dalam Ekperimen* II *berbanding Eksperimen* I 5. Frequency of effective collision between particles is higher in Experiment II than in Experiment I // *Frekuensi perlanggaran berkesan antara zarah lebih tinggi dalam Ekperimen* II *berbanding Eksperimen* I	1 1 1 1 1	

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No			Mark Scheme	Mark	Total marks
			• Experiment I and III *Eksperimen* I *dan* III Sample answer : 6. Rate of reaction in Experiment III is higher than Experiment I // *Kadar tindak balas dalam Eksperimen* III *lebih tinggi berbanding Eksperimen* I 7. Temperature of hydrochloric acid in Experiment III is higher than Experiment I // *Suhu larutan asid hidroklorik dalam Eksperimen* III *lebih tinggi berbanding di Eksperimen* I 8. Kinetic energy of hydrogen ion in Experiment III is higher than Experiment I // hydrogen ion in Experiment III moves faster than Experiment I // *Tenaga kinetik ion hidrogen lebih tinggi dalam Eksperimen* III *berbanding Eksperimen* I // *ion hidrogen bergerak lebih laju dalam Eksperimen* III *berbanding Eksperimen* I 9. Frequency of collision between calcium carbonate and hydrogen ion is higher in Experiment III than Experiment I // *Frekuensi pelanggaran antara kalsium karbonat dan ion hidrogen lebih tinggi dalam Ekperimen* III *berbanding Eksperimen* I 10. Frequency of effective collision between particles is higher in Experiment III than Experiment I //*Frekuensi perlanggaran berkesan antara zarah dalam Ekperimen* III *lebih tinggi berbanding Eksperimen* I	1 1 1 1 1	10
				TOTAL	**20**

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No			Mark Scheme	Mark	Total marks
8	(a)		[Able to suggest a name for another possible substance that can replace formic acid and able to explain the differences correctly] Sample answer: 1. Acetic acid // ethanoic acid // [any suitable acid] *Asid asetik // asid etanoik // [sebarang asid yang sesuai]* 2. Ammonia aqueous consists of hydroxide ions which are negatively charge // A*mmonia akueus mengandungi ion hidroksida yang bercas negatif.* 3. Hydroxide ions from ammonia neutralise hydrogen ions / acid produced by bacteria // *ion hidroksida daripada ammonia meneutralkan ion hidrogen / asid yang dihasilkan oleh bakteria.* 4. Protein membrane remains negatively charge // *Membran protein kekal bercas negatif.* 5. Hydrogen ions from acid neutralise the negative charges of protein membrane // *Ion hidrogen daripada asid meneutralkan cas negatif membran protein.* 6. Rubber particles collide between each other causes the protein membrane breaks. Rubber molecules combine / entangle // *Zarah getah berlanggar antara satu sama lain menyebabkan membran protein pecah. Molekul getah bergabung / berselirat.*	1 1 1 1 1 1	6

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<table>
<tr><th colspan="3">No</th><th>Mark Scheme</th><th>Mark</th><th>Total marks</th></tr>
<tr><td></td><td>(b)</td><td></td><td>[Able to give the name of compound P correctly]

Answer :
1. Hexane // heksena

[Able to identify the homologous series, functional group and general formula correctly]

Answer :

<table>
<tr><td>Compound
Sebatian</td><td>Homologous series
Siri homolog</td><td>Functional group
Kumpulan berfungsi</td><td>General formula
Formula am</td></tr>
<tr><td>P</td><td>2. Alkene
Alkena</td><td>3. Carbon-carbon double bond // Ikatan ganda dua antara atom karbon // C=C</td><td>4. C_nH_{2n}</td></tr>
<tr><td>Q</td><td>5. Carboxylic acid
Asid karboksilik</td><td>6. Carboxyl //Karboksil // COOH</td><td>7. C_nH_{2n+1} COOH</td></tr>
<tr><td>R</td><td>8. Alcohol
Alkohol</td><td>9. Hydroxyl Hidroksil // OH</td><td>10. C_nH_{2n+1} OH</td></tr>
</table>
</td><td>1

1 + 1 + 1

1 + 1 + 1

1 + 1 + 1</td><td>10</td></tr>
<tr><td></td><td>(c)</td><td></td><td>[Able to write a balanced chemical equation and calculate the gas released correctly]

1. Correct formulae of reactants and products
Formula bahan dan hasil tindak balas yang betul
2. Balanced equation
Persamaan seimbang

Sample answer:

$C_6H_{14} + \frac{19}{2}O_2 \rightarrow 6CO_2 + 7H_2O$ //
$2C_6H_{14} + 19O_2 \rightarrow 12CO_2 + 14H_2O$</td><td>1

1</td><td>2</td></tr>
</table>

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No			Mark Scheme	Mark	Total marks
			[Able to calculate the volume of carbon dioxide gas correctly] 3. Ratio of mole *Nisbah mol* 4. Volume of gas with correct unit *Isi padu gas berserta unit yang betul* Sample answer: 1 mol of C_6H_{14} produces 6 mol of CO_2 gas // 1 mol C_6H_{14} *menghasilkan* 6 mol CO_2 // 0.05 mol of C_6H_{14} produces 0.3 mol of CO_2 gas // 0.05 mol C_6H_{14} *menghasilkan* 0.3 mol CO_2 // Volume of CO_2 = 0.3 x 24 = 7.2 dm^3 // 7200 cm^3 *Isipadu gas* CO_2	1 1	2
				TOTAL	**20**

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No.			Mark Scheme	Mark	Total marks
9.	(a)	(i)	[Able to state the type of Cell I and Cell II correctly] Sample answer : Cell I : Chemical cell // voltaic cell // *Sel kimia // Sel voltan* Cell II : Electrolytic cell // *Sel elektrolisis*	 1 1	 2
		(ii)	[Able to suggest a suitable electrode X and electrolyte Y correctly] Sample answer : Electrode X: Magnesium // Mg // Aluminium // Al // Zinc // Zn // Iron // Fe // Tin // Sn *Elektrod* X *: Magnesium // Mg // Aluminium //Al // Zink //Zn // Ferum // Fe // Stanum // Sn* **r:** Potassium/K // Sodium/ Na// Calcium/ Ca// Lead/ Pb Electrolyte Y: Silver nitrate/ $AgNO_3$ solution // Silver sulphate/ Ag_2SO_4 solution // *Elektrolit* Y*: Larutan argentum nitrat* /$AgNO_3$ // *Larutan argentum sulfat* / Ag_2SO_4	 1 1	 2

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No.			Mark Scheme	Mark	Total marks
		(iii)	[Able to explain the oxidation reaction in Cell I based on the electron transfer and write the half equation correctly] Sample answer : 1. Magnesium // Mg // Aluminium // Al // Zinc // Zn // Iron // Fe // Tin // Sn undergoes oxidation reaction *Magnesium // Mg // Aluminium //Al // Zink // Zn // Ferum // Fe // Stanum // Sn mengalami tindak balas pengoksidaan.* 2. Magnesium // Mg // Aluminium // Al // Zinc // Zn // Iron // Fe // Tin // Sn atom releases electrons to form magnesium ion // Mg^{2+} ion // // aluminium ion // Al^{3+} ion // zinc // Zn^{2+} ion // iron(II) ion // Fe^{2+} ion // tin(II) ion // Sn^{2+} ion *Magnesium // Mg // Aluminium // Al // Zinc // Zn // Iron // Fe // Tin // Sn atom melepaskan elektron untuk menghasilkan magnesium ion* // Mg^{2+} *ion* // // *aluminium ion* // Al^{3+} *ion* // *zinc* // Zn^{2+} *ion* // *iron*(II) *ion* // Fe^{2+} *ion* // *tin*(II) *ion* // Sn^{2+} *ion* 3. Oxidation half equation : *Setengah persamaan pengoksidaan :* $Mg \rightarrow Mg^{2+} + 2e$ // $Al \rightarrow Al^{3+} + 3e$ // $Zn \rightarrow Zn^{2+} + 2e$ // $Fe \rightarrow Fe^{2+} + 2e$ // $Sn \rightarrow Sn^{2+} + 2e$ [Able to explain the reduction reaction in Cell II based on the electron transfer and write the half equation correctly] 4. Silver ion / Ag^+ ion undergoes reduction *Ion argentum / ion* Ag^+ *mengalami penurunan* 5. Silver ion / Ag^+ ion receives electron to form silver atom // *Ion argentum / ion* Ag^+ *menerima elektron menghasilkan atom argentum* 6. Reduction half equation : *Setengah persamaan penurunan :* $Ag^+ + e \rightarrow Ag$	1 1 1 1 1 1 1	6

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No.			Mark Scheme	Mark	Total marks
	(b)		[Able to name halogen Y correctly] Sample answer : 1. Chlorine // Bromine // *Klorin // Bromin* **Notes**: Accept chlorine if reacted with potassium iodide/ potassium bromide solution. Accept bromine if reacted with potassium iodide solution. *Nota : Terima klorin jika bertindak balas dengan larutan kalium iodida / kalium bromida.* *Terima bromin jika bertindak balas dengan larutan kalium iodida.* [Able to describe a laboratory experiment to investigate the displacement of a halogen X, state the observation at each terminal and write the overall ionic equation correctly] 2. Pour / Drop dilute sulphuric acid in a U-tube slowly until half full and clamp the U-tube. *Tuangkan / titiskan asid sulfurik cair ke dalam tiub-U perlahan-lahan hingga separuh penuh dan apitkan tiub-U.* 3. Pour / Drop chlorine water slowly into one arm of the U-tube. *Tuangkan / titiskan air klorin perlahan-lahan ke dalam satu lengan tiub-U.* 4. Pour / Drop potassium iodide / potassium bromide solution slowly into another arm of the U-tube. *Tuangkan / titiskan larutan kalium iodida / kalium bromida perlahan-lahan ke dalam satu lengan lain tiub-U.* 5. Dip carbon electrodes into the both solutions and connect the electrodes to a galvanometer / ammeter / voltmeter by using connecting wires. *Celupkan elektrod karbon ke dalam ke dua-dua larutan dan sambungkan elektrod kepada galvanometer / ammeter / voltmeter menggunakan wayar penyambung.* 6. Record the observations after [15- 30] minutes. *Rekodkan pemerhatian selepas [15 – 30] minit.*	1 1 1 1 1 1	

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

<table>
<tr><th colspan="3">No.</th><th>Mark Scheme</th><th>Mark</th><th>Total marks</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Terminal</th><th>Observation
Pemerhatian</th></tr>
<tr><td>7. Positive
Positif</td><td>Greenish yellow solution turns colorless//
[if using chlorine water]
Larutan kuning kehijauan bertukar kepada tak berwarna
[jika menngunakan air klorin]
Brown solution turns colourless
[if using bromine water]
Larutan perang bertukar kepada tak berwarna.
[jika menggunakan air bromin]</td></tr>
<tr><td>8. Negative
Negatif</td><td>Colorless solution turns brown
Larutan tak berwarna berukar kepada perang</td></tr>
</table>
9. Correct formulae of reactants and products
10. Balanced ionic equation

$Br_2 + 2I^- \rightarrow I_2 + 2Br^-$
$Cl_2 + 2Br^- \rightarrow Br_2 + 2Cl^-$
$Cl_2 + 2I^- \rightarrow I_2 + 2Cl^-$
</td><td>1
1
1</td><td>10</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td></td><td>20</td></tr>
</table>

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

No.			Mark Scheme	Mark	Total marks
10	(a)		[Able to state the name of the brown solid formed in reaction II, determine which reaction is suitable for the preparation of salt and write the overall ionic equation for the preparation of the salt correctly] Answer : 1. Copper // *kuprum* 2. Reaction I //*Tindak balas* I 3. Correct formulae of reactants and products // *Formula bahan dan hasil tindak balas yang betul* 4. Balanced equation // *Persamaan seimbang* $Mg + 2H^+ \rightarrow Mg^{2+} + H_2$	1 1 1 1	4
	(b)	(i)	[Able to name reaction X, suggest solution L and acid M correctly] Sample answer : 1. Double decomposition reaction // precipitation reaction // *Tindak balas penguraian ganda dua // tindak balas pemendakan* 2. Solution L : Sodium carbonate // Na_2CO_3// Ammonium carbonate//$(NH_4)_2CO_3$// potassium carbonate // K_2CO_3 // *Larutan* L : *natrium karbonat* // Na_2CO_3// *ammonium karbonat* // //$(NH_4)_2CO_3$ //*kalium karbonat* // K_2CO_3 3. Acid M : Nitric acid // HNO_3 // hydrochloric acid // HCl // sulphuric acid //H_2SO_4 // *Asid* M : *asid nitrik* // HNO_3 // *asid hidroklorik* // HCl// *asid sulfurik* //H_2SO_4	1 1 1	3

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

No			Mark Scheme	Mark	Total marks
		(ii)	[Able to describe a confirmatory test for the cation in solution W correctly] Sample answer : 1. Measure and pour 2 cm^3 of solution W// copper(II) nitrate// copper(II) chloride// copper(II) sulphate solution in a test tube. *Sukat dan tuangkan* 2 cm^3 l*arutan* W // *kuprum*(II) *nitrat* // *kuprum*(II) *klorida, kuprum*(II) *sulfat ke dalam tabung uji* 2. Add 2 cm^3 of sodium hydroxide solution into the test tube until excess // *Tambahka*n 2 cm^3 *larutan natrium hidroksida ke dalam tabung uji itu sehingga berlebihan* 3. Blue precipitate is formed in excess sodium hydroxide solution // *Mendakan biru terbentuk dalam larutan natrium hidroksida berlebihan* Or 1. Measure and pour 2 cm^3 of solution W// copper(II) nitrate// copper(II) chloride// copper(II) sulphate solution in a test tube. *Sukat dan tuangkan* 2 cm^3 *larutan* W // *kuprum*(II) *nitrat* // *kuprum*(II) *klorida, kuprum*(II) *sulfat ke dalam tabung uji* 2. Add 2 cm^3 of ammonia aqueous into the test tube until excess *Tambahka*n 2 cm^3 *ammonia akueus ke dalam tabung uji itu sehingga berlebihan* 3. Blue precipitate formed, soluble in excess ammonia aqueous to form dark blue solution. *Mendakan biru terbentuk, larut dalam ammonia akueus berlebihan membentuk larutan biru tua.*	1 1 1 Or 1 1 1	3

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk kegunaan Pemeriksa Guru SBP Sahaja)

	(c)		[Able to describe an experiment to prepare salt W correctly] Sample answer : 1. Measure and pour [25 -100] cm^3 of [0.1 – 1.0] mol dm^{-3} of nitric acid / hydrochloric acid / sulphuric acid in a beaker. *Sukat dan tuangkan* [25 -100] cm^3 *asid nitrik / asid hidroklorik / asid sulfurik* [0.1 – 1.0] mol dm^{-3} *ke dalam bikar.* 2. Heat the nitric acid / hydrochloric acid/ sulphuric acid gently. *Panaskan asid nitrik / asid hidroklorik / asid sulfurik secara perlahan.* 3. Add copper(II) carbonate powder little by little into the beaker until excess. *Tambahkan serbuk kuprum*(II) *karbonat sedikit demi sedikit ke dalam bikar sehingga berlebihan*. 4. Stir the mixture. *Kacau campuran*. 5. Filter the mixture. *Turaskan campuran*. 6. Transfer the filtrate into an evaporating dish and heat the filtrate until saturated / one-third from its original volume. *Pindahkan hasil turasan ke dalam mangkuk penyejat dan panaskan hasil turasan sehingga tepu / satu pertiga daripada isipadu asal*. 7. Cool the saturated solution and filter the salt crystals. *Sejukkan larutan tepu dan turaskan hablur garam*. 8. Dry the salt with filter papers. *Keringkan garam dengan kertas turas*. Chemical equation // *Persamaan kimia*: 9. Correct formulae of reactants and products *Formula bahan dan hasil tindak balas yang betul* 10. Balanced equation *Persamaan seimbang* $CaCO_3 + 2HNO_3 \rightarrow Ca(NO_3)_2 + CO_2 + H_2O$// $CaCO_3 + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$// $CaCO_3 + H_2SO_4 \rightarrow CuSO_4 + CO_2 + H_2O$	1 1 1 1 1 1 1 1 1 1	10
			Total		**20**

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk kegunaan Pemeriksa Guru SBP Sahaja)

MARKING SCHEME CHEMISTRY
PAPER 3

https://cikguadura.wordpress.com/

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>1(a)</td><td>Able to state all the voltmeter readings accurately with unit and one decimal place correctly

<u>Sample answer:</u>

<table>
<tr><td>Name of compound
Nama sebatian</td><td>Solid state
Keadaan pepejal</td><td>Aqueous solution
Larutan akueus</td></tr>
<tr><td>Sodium sulphate
Natrium sulfat</td><td>0.0 A</td><td>1.0 A</td></tr>
<tr><td>Copper(II) nitrate
Kuprum(II) nitrat</td><td>0.0 A</td><td>3.0 A</td></tr>
<tr><td>Glucose
Glukosa</td><td>0.0 A</td><td>0.0 A</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Able to state all the voltmeter readings accurately without unit or reading with unit.

<u>Sample answer:</u>

<table>
<tr><td>Name of compound
Nama sebatian</td><td>Solid state
Keadaan pepejal</td><td>Aqueous solution
Larutan akueus</td></tr>
<tr><td>Sodium sulphate
Natrium sulfat</td><td>0.0</td><td>1.0</td></tr>
<tr><td>Copper(II) nitrate
Kuprum(II) nitrat</td><td>0.0</td><td>3.0</td></tr>
<tr><td>Glucose
Glukosa</td><td>0.0</td><td>0.0</td></tr>
</table>
<table>
<tr><td>Name of compound
Nama sebatian</td><td>Solid state
Keadaan pepejal</td><td>Aqueous solution
Larutan akueus</td></tr>
<tr><td>Sodium sulphate
Natrium sulfat</td><td>0 A</td><td>1 A</td></tr>
<tr><td>Copper(II) nitrate
Kuprum(II) nitrat</td><td>0 A</td><td>3 A</td></tr>
<tr><td>Glucose
Glukosa</td><td>0 A</td><td>0 A</td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to state any 4 readings correctly without unit</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM (Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>1(b)</td><td>Able to construct a table to record the ammeter reading for each experiment in solid state and aqueous solution with unit accurately

<u>Sample answer:</u>

<table>
<tr><td rowspan="2">Name of compound
Nama sebatian</td><td colspan="2">Ammeter reading, A
Bacaan ammeter, A</td></tr>
<tr><td>Solid state
Keadaan pepejal</td><td>Aqueous solution
Larutan akueus</td></tr>
<tr><td>Sodium sulphate
Natrium sulfat</td><td>0.0</td><td>1.0</td></tr>
<tr><td>Copper(II) nitrate
Kuprum(II) nitrat</td><td>0.0</td><td>3.0</td></tr>
<tr><td>Glucose
Glukosa</td><td>0.0</td><td>0.0</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Able to construct a table to record the ammeter reading for each experiment in solid state and aqueous solution with unit

<u>Sample answer:</u>

<table>
<tr><td rowspan="2">Name of compound
Nama sebatian</td><td colspan="2">Ammeter reading
Bacaan ammeter</td></tr>
<tr><td>Solid state
Keadaan pepejal</td><td>Aqueous solution
Larutan akueus</td></tr>
<tr><td>Sodium sulphate
Natrium sulfat</td><td>0.0</td><td>1.0</td></tr>
<tr><td>Copper(II) nitrate
Kuprum(II) nitrat</td><td>0.0</td><td>3.0</td></tr>
<tr><td>Glucose
Glukosa</td><td>0.0</td><td>0.0</td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to construct a table to record any 4 voltmeter readings without unit
.</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
1(c)	*Able to state all the three variables correctly* <u>Sample answer:</u> (i) The manipulated variable : Type of compounds // Ionic compound and covalent compound *Pembolehubah dimanipulasi : Jenis Sebatian // sebatian ion dan sebatian kovalen* (ii) The responding variable : Ammeter reading // Electrical conductivity *Pembolehubah bergerakbalas : Bacaan ammeter // kekonduksian elektrik* (iii) The fixed variable : Physical state of compounds // solid and aqueous solutions *Pembolehubah dimalarkan : keadaan fizik sebatian // pepejal dan larutan akueus*	3
	Able to state two variables correctly	2
	Able to state one variable correctly	1
	No response or wrong response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
1(d)	*Able to state the relationship between the manipulated variable and the responding variable with direction.* Sample answer: Covalent compound cannot conduct electricity in solid state and aqueous solution whereas ionic compound can conduct electricity in aqueous solution but cannot in solid state. // *Sebatian kovalen tidak boleh mengkonduksikan elektrik dalam keadaan pepejal dan larutan akueus manakala sebatian ion boleh mengkonduksikan elektrik dalam keadaan akueus tetapi tidak boleh mengkonduksikan elektrik dalam keadaan pepejal*	3
	Able to state the relationship between the manipulated variable and responding variable. Sample answer: Covalent compound cannot conduct electricity in solid state and aqueous solution. // *Sebatian kovalen tidak boleh mengkonduksikan elektrik dalam keadaan pepejal dan larutan akueus //* Ionic compound can conduct electricity in aqueous solution but not in solid state. // *Sebatian ion boleh mengkonduksikan elektrik dalam keadaan akueus tetapi tidak boleh mengkonduksikan elektrik dalam keadaan pepejal*	2
	Able to state the idea of hypothesis Sample answer: Covalent compound cannot conduct electricity but ionic compound can conduct electricity. *Sebatian kovalen tidak boleh mengkonduksikan elektrik tetapi sebatian ion boleh mengkonduksikan elektrik.*	1
	No response or wrong response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>1(e)</td><td>Able to state all the relationship between electrical conductivity with the type of particles and the movement of particles correctly

<u>Sample answer:</u>

<table>
<tr><th>State of compounds
Keadaan sebatian</th><th>Relationship
Hubungan</th></tr>
<tr><td>Solid copper(II) nitrate
Pepejal kuprum(II) nitrat</td><td>Ions that are not freely moving do not conduct electricity.
Ion-ion yang tidak bebas bergerak maka tidak boleh mengkonduksikan elektrik</td></tr>
<tr><td>Copper(II) nitrate solution
Larutan kuprum(II) nitrat</td><td>Ions that are freely moving conduct electricity
Ion-ion yang bebas bergerak boleh mengkonduksikan elektrik</td></tr>
<tr><td>Glucose solution
Larutan glukosa</td><td>Neutral molecules that freely moving cannot conduct electricity
Molekul-molekul neutral yang tidak bebas bergerak maka tidak boleh mengkonduksikan elektrik</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Able to state two relationship between electrical conductivity with the type of particles and the movement of particles less correctly</td><td>2</td></tr>
<tr><td></td><td>Able to state one relationship between electrical conductivity with the type of particles and the movement of particles less correctly</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
1(f)	*Able to state the operational definition for the electrical conductivity of ionic compound correctly* What should be observed : ammeter needle deflects *Apa yang diperhatikan : jarum ammeter terpesong* What should be done : two carbon electrodes connected to ammeter using connecting wire are dipped in an ionic compound solution *Apa yang dibuat : dua elektrod karbon disambungkan kepada ammeter dengan wayar penyambung dicelupkan ke dalam larutan sebatian ion* <u>Sample answer:</u> Ammeter needle deflects when two carbon electrodes connected to ammeter using connecting wire are dipped in an ionic compound solution *Jarum ammeter terpesong apabila dua elektrod karbon disambungkan kepada ammeter dengan wayar penyambung dicelupkan ke dalam larutan sebatian ion*	3
	Able to state the operational definition for the electrical conductivity of ionic compound <u>Sample answer:</u> Ammeter needle deflects // *Jarum ammeter terpesong//* Two carbon electrodes connected to ammeter using wire are dipped in an ionic compound solution // *Dua elektrod karbon disambungkan kepada ammeter dengan wayar penyambung dicelupkan ke dalam larutan sebatian ion.*	2
	Able to state an idea for the electrical conductivity <u>Sample answer:</u> Different compound shows different ammeter reading *Sebatian yang berbeza menunjukkan bacaan ammeter yang berbeza*	1
	No response or wrong response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
2(a)(i)	*Able to give observation correctly* Sample answer: White solid dissolved in nitric acid and sodium hydroxide solution // *Pepejal putih larut dalam asid nitrik dan larutan natrium hidroksida //* Colourless solution formed // *Larutan tak berwarna terhasil*	3
	Able to give observation Sample answer: Solution formed // *Larutan terhasil* // Oxide X dissolved in nitric acid // *X oksida larut dalam asid nitrik* Oxide X dissolved in sodium hydroxide solution.// *X oksida larut dalam larutan natrium hidroksida*	2
	Able to state an idea for the observation Sample answer: Solid dissolve in water // *Pepejal larut dalam air*	1
	No response or wrong response	0

Question	Rubric	Score
2(a)(ii)	*Able to give inference correctly* Sample answer: Oxide X is soluble in nitric acid and sodium hydroxide solution // *X oksida larut dalam asid nitrik dan larutan natrium hidroksida*. // Oxide X shows basic and acidic properties // *X oksida menunjukkan sifat bes dan asid*	3
	Able to give inference Sample answer: Oxide X is soluble in nitric acid // *X oksida larut dalam asid nitrik* Oxide X is soluble in sodium hydroxide solution // *X oksida larut dalam larutan natrium hidroksida*. // Oxide X shows basic properties // *X oksida menunjukkan sifat bes* Oxide X shows acidic properties // *X oksida menunjukkan sifat asid*	2
	Able to state an idea for the observation Sample answer: Acidic properties // *sifat asid* Basic properties // *sifat bes*	1
	No response or wrong response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(UNTUK kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
2(a)(iii)	*Able to give the property of oxide X correctly* Sample answer: Amphoteric // *Amfoterik*	3
	Able to give the property of oxide X Sample answer: Basic and acidic // *Bes dan asid*	2
	Able to state an idea for the property of oxide X Sample answer: Acid // *Asid* // Base // *Bes*	1
	No response or wrong response	0

Question	Rubric	Score
2(b)(i)	*Able to give the prediction of observation correctly* Sample answer: Red litmus paper turns blue/ / *Kertas litmus merah bertukar kepaada biru* Blue litmus paper turns red // *Kertas litmus biru bertukar kepada merah*	3
	Able to give the prediction of observation Sample answer: Change to blue // *Bertukar kepada biru* Change to red // *Bertukar kepada merah*	2
	Able to state an idea for the property of the prediction of observation Sample answer: Blue // *Blue litmus paper remains unchanged* *Biru// kertas litmus biru kekal tidak berubah* Red // *Red litmus paper remains unchanged* *Merah // kertas litmus merah kekal tidak berubah*	1
	No response or wrong response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>2(b)(ii)</td><td>Able to classify oxides into acidic oxide and basic oxide correctly
<u>Sample answer:</u>
<table><tr><td>Acidic oxide
Oksida asid</td><td>Phosphorous pentoxide // Fosforus pentoksida
Carbon dioxide // Karbon dioksida</td></tr><tr><td>Basic oxide
Oksida bes</td><td>Magnesium oxide // Magnesium oksida
Calcium oxide // Kalsium oksida</td></tr></table></td><td>3</td></tr>
<tr><td></td><td>Able to classify three oxides correctly</td><td>2</td></tr>
<tr><td></td><td>Able to classify two oxides correctly</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
3 (a)	*Able to state the problem statement correctly* <u>Sample answer:</u> Does the heat of neutralisation between strong acid and strong alkali higher than strong acid and weak alkali?// *Adakah haba peneutralan antara asid kuat dengan alkali kuat lebih tinggi daripada asid kuat dengan alkali lemah?//* Does the heat of neutralisation between hydrochloric acid and sodium hydroxide solution higher than hydrochloric acid and ammonia solution?// *Adakah haba peneutralan antara asid hidroklorik dengan larutan natrium hidroksida lebih tinggi daripada asid hidroklorik dengan larutan ammonia?*	3
	Able to state the problem statement <u>Sample answer:</u> Does the heat of neutralisation between strong acid and alkali P higher than strong acid and alkali Q?// *Adakah haba peneutralan antara asid kuat dengan alkali P lebih tinggi daripada asid kuat dengan alkali Q?//* Does the heat of neutralisation between strong acid and strong alkali and strong acid and weak alkali differ? *Adakah haba peneutralan antara asid kuat dan alkali kuat berbeza dengan asid kuat dan alkali lemah?* Does the heat of neutralisation between hydrochloric acid and sodium hydroxide solution and hydrochloric acid and ammonia solution differ? *Adakah haba peneutralan antara asid hidroklorik dan larutan natrium hidroksida berbeza dengan asid hidroklorik dan larutan ammonia?*	2
	Able to give an idea of the problem statement <u>*Sample answer:*</u> To determine the heat of neutralisation between hydrochloric acid and strong alkali and the heat of neutralisation between hydrochloric acid and weak alkali *Untuk menentukan haba peneutralan antara asid hidroklorik dan alkali kuat dan haba peneutralan antara asid hidroklorik dan alkali lemah.//* Does heat of neutralisation of alkali P is higher than alkali Q? *Adakah haba peneutralan alkali P lebih tinggi daripada alkali Q?*	1
	Wrong response or no response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
3 (b)	*Able to state all the variables correctly* <u>Sample answer:</u> Manipulated variable : Type of alkali// *Jenis alkali//* Strong alkali and weak alkali// *Alkali kuat dan alkali lemah* Sodium hydroxide solution and ammonia aqueous // *Larutan natrium hidroksida dan ammonia akueus* Responding variable : Heat of neutralization // *Haba peneutralan* // Increase of temperature // *Kenaikan suhu* Constant variable : Type of acid // *Jenis asid //* Hydrochloric acid // *Asid hidroklorik //* Concentration dan volume of hydrochloric acid // *Kepekatan dan isi padu asid hidroklorik //* Concentration dan volume of alkali // *Kepekatan dan isi padu alkali*	3
	Able to state any two variables correctly	2
	Able to state any one variable correctly	1
	Wrong response or no response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
3 (c)	*Able to state the hypothesis accurately with direction* <u>Sample answer:</u> Reaction between hydrochloric acid and strong alkali produces higher heat of neutralisation than hydrochloric acid and weak alkali // *Tindak balas antara asid hidroklorik dengan alkali kuat menghasilkan haba peneutralan yang lebih tinggi daripada asid hidroklorik dengan alkali lemah //* Reaction between hydrochloric acid and sodium hydroxide solution produces higher heat of neutralisation than hydrochloric acid and ammonia solution // *Tindak balas antara asid hidroklorik dengan larutan natrium hidroksida menghasilkan haba peneutralan yang lebih tinggi daripada asid hidroklorik dengan larutan ammonia*	3
	Able to state the hypothesis <u>Sample answer:</u> Heat of neutralisation produced by strong alkali higher than weak alkali *Haba peneutralan yang dihasilkan oleh alkali kuat lebih tinggi daripada alkali lemah*	2
	Able to give an idea of the hypothesis <u>Sample answer:</u> Reaction between hydrochloric acid and strong alkali produces higher heat of neutralisation// *Tindak balas asid hidroklorik dengan alkali kuat menghasilkan haba peneutralan yang lebih tinggi//* Heat of neutralisation produced are different// *Haba peneutralan yang dihasilkan adalah berbeza*	1
	Wrong response or no response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
3 (d)	*Able to list all materials and apparatus completely* <u>Sample answer :</u> Materials : Hydrochloric acid [0.1 – 2.0 mol dm^{-3}] Any strong alkali [0.1 - 2.0 mol dm^{-3}] Any weak alkali // Ammonia aqueous [0.1 - 2.0 mol dm^{-3}] *Asid hidroklorik* [0.1 – 2.0 mol dm^{-3}] *Sebarang alkali kuat* [0.1 - 2.0 mol dm^{-3}] *Sebarang alkali lemah* // *Ammonia akueus* [0.1 - 2.0 mol dm^{-3}] Apparatus: Polystyrene cups // *Cawan polisterina* Measuring cylinder // *Silinder penyukat* Thermometer // *Termometer*	3
	Able to list materials and apparatus less correctly <u>Sample answer :</u> Materials : Hydrochloric acid // *hidroklorik asid* Any strong alkali // *sebarang alkali kuat* Any weak alkali // *sebarang alkali lemah* Apparatus : Polystyrene cup // *cawan polisterina* Thermometer // *termometer*	2
	Able to list the minimum materials and apparatus Sample answer : Any strong acid // *sebarang asid kuat* Any strong alkali // *sebarang alkali kuat* Any weak alkali // *sebarang alkali lemah* Apparatus : Any suitable container //*bekas yang sesuai* Thermometer // termometer	1
	Wrong response or no response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

Question	Rubric	Score
3 (e)	*Able to state procedures of the experiment completely* Sample answer : Procedure: 1. Measure and pour [25 - 100] cm^3 of 1.0 mol dm^{-3} of hydrochloric acid into a polystyrene cup. 2. Measure and pour [25 - 100] cm^3 of 1.0 mol dm^{-3} of sodium hydroxide solution into another polystyrene cup. 3. Record the initial temperature of both solutions. 4. Pour hydrochloric acid quickly and carefully into sodium hydroxide solution. 5. Stir the mixture with thermometer. 6. Record the highest temperature. 7. Repeat the experiment by using 1.0 mol dm^{-3} of ammonia solution to replace sodium hydroxide solution. *Prosedur:* *1. Sukat dan tuang [25 - 100] cm^3 asid hidroklorik 1.0 mol dm^{-3} ke dalam cawan polisterina.* *2. Sukat dan tuang [25 - 100] cm^3 larutan natrium hidroksida 1.0 mol dm^{-3} ke dalam cawan polisterina yang lain.* *3. Rekod suhu awal kedua-dua larutan.* *4. Tuang asid hidroklorik dengan cepat dan berhati-hati ke dalam larutan natrium hidroksida.* *5. Kacau campuran dengan termometer.* *6. Rekod suhu tertinggi.* *7. Ulangi eksperimen menggunakan ammonia akueus 1.0 mol dm^{-3} bagi menggantikan larutan natrium hidroksida.*	3
	Able to state steps 1, 2, 3, 4, 6	2
	Able to state steps 1, 2, 4	1
	Wrong response or no response	0

SULIT & HAK CIPTA SEKOLAH BERASRAMA PENUH KPM
(Untuk Kegunaan Pemeriksa Guru SBP Sahaja)

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>3 (f)</td><td>Able to tabulate the data completely

<table>
<tr><td>Type of alkali
Jenis alkali</td><td>Strong alkali
Alkali kuat</td><td>Weak alkali
Alkali lemah</td></tr>
<tr><td>Initial temperature of alkali /^{o}C
<i>Suhu awal alkali /^{o}C</td><td></td><td></td></tr>
<tr><td>Initial temperature of acid /^{o}C
Suhu awal asid / ^{o}C</td><td></td><td></td></tr>
<tr><td>Highest temperature of the mixture / ^{o}C
Suhu tertinggi campuran / ^{o}C</td><td></td><td></td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Able to construct a table with correct heading

<table>
<tr><td>Type of alkali
Jenis alkali</td><td></td><td></td></tr>
<tr><td>Initial temperature of alkali
Suhu awal alkali</td><td></td><td></td></tr>
<tr><td>Initial temperature of acid
Suhu awal asid</td><td></td><td></td></tr>
<tr><td>Highest temperature of the mixture
Suhu tertinggi campuran</td><td></td><td></td></tr>
</table></td><td>1</td></tr>
<tr><td></td><td>Wrong response or no response</td><td>0</td></tr>
</table>

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END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

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