

### SKEMA PPC KIMIA KERTAS 1 2026

|    |   |    |   |    |   |    |   |
|----|---|----|---|----|---|----|---|
| 1  | A | 11 | B | 21 | A | 31 | D |
| 2  | B | 12 | D | 22 | B | 32 | C |
| 3  | C | 13 | D | 23 | B | 33 | A |
| 4  | C | 14 | D | 24 | C | 34 | B |
| 5  | B | 15 | A | 25 | D | 35 | D |
| 6  | B | 16 | B | 26 | D | 36 | C |
| 7  | B | 17 | B | 27 | D | 37 | A |
| 8  | A | 18 | C | 28 | D | 38 | D |
| 9  | C | 19 | D | 29 | D | 39 | A |
| 10 | A | 20 | A | 30 | C | 40 | A |

**A : 10**

**B : 10**

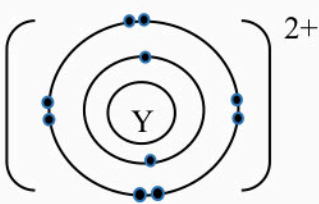
**C : 10**

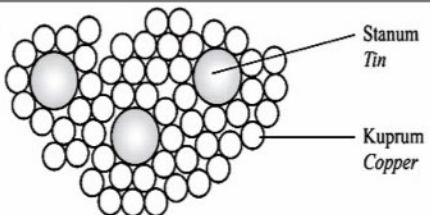
**D : 10**

**PERATURAN PEMARKAHAN  
PEPERIKSAAN PERCUBAAN SPM 2026**

| No |     |  | Rubrik                                                                                                              | Mark | Total marks |
|----|-----|--|---------------------------------------------------------------------------------------------------------------------|------|-------------|
| 1  | (a) |  | P: Termoplastik / <i>Thermoplastic</i>                                                                              | 1    | 2           |
|    |     |  | Q: Termoset / <i>Thermoset</i>                                                                                      | 1    |             |
|    | (b) |  | Bakelit / melamina // <i>bakelite / melamine</i>                                                                    | 1    | 1           |
|    | (c) |  | 1. Daya tarikan antara rantai polimer adalah lemah.<br><i>The attraction force between polymer chains are weak.</i> | 1    | 2           |
|    |     |  | 2. Polimer P melebur dan mengeras apabila disejukkan.<br><i>Polymer P melts and solidify when cooled</i>            | 1    |             |
|    |     |  | Jumlah                                                                                                              | 5    |             |

| No | Rubrik |                                                               | Mark | Total marks |
|----|--------|---------------------------------------------------------------|------|-------------|
| 2  | (a)    | Minyak zaitun // Minyak sawit<br><i>Olive oil // Palm oil</i> | 1    | 1           |
|    |        |                                                               |      |             |
|    | (b)    | (i) Penghidrogenan<br><i>Hydrogenation</i>                    | 1    | 1           |
|    |        | (ii) Cecair menjadi pepejal<br><i>Liquid turns to solid</i>   | 1    | 1           |
|    |        | (iii) Saponifikasi<br><i>Saponification</i>                   | 1    | 1           |
|    | (c)    | Pengantioksida<br><i>Antioxidant</i>                          | 1    | 1           |
|    |        | Jumlah                                                        | 5    |             |

| No | Rubric |                                                                                                                                                                                   | Marks  | Total Marks |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------|
| 3  | (a)    | (i) Tertib menaik nombor proton<br><i>Increasing order of proton number</i>                                                                                                       | 1      | 1           |
|    |        | (ii) Kumpulan 2 kerana atom X mempunyai dua elektron valens<br><i>Group 2 because atom X has 2 valence electrons</i>                                                              | 1      | 1           |
|    | (b)    | (i) Atom X: 2.8.2<br>Atom Y: 2.6                                                                                                                                                  | 1<br>1 | 2           |
|    |        | (ii) 1. <i>bilangan petala dan bilangan elektron betul</i><br>2. <i>cas ion yang betul</i><br> | 1<br>1 | 2           |
|    |        | <b>JUMLAH</b>                                                                                                                                                                     | 6      |             |

| No |     | Rubric                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Mark                | Total marks   |
|----|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------|
| 4  | (a) | Gangsa lebih kuat/ keras daripada kuprum.<br><i>Bronze is stronger/ harder than copper</i>                                                                                                                                                                                                                                                                                                                                                                                 | 1                   | 1             |
|    | (b) | 1. Lukisan susunan atom<br>2. Melabel atom                                                                                                                                                                                                                                                                                                                                               | 1<br>1              | 2             |
|    | (c) | Zink/ Zinc                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                   | 1             |
|    | (d) | 1. Atom kuprum mengganggu susunan teratur lapisan atom aluminium<br><i>Copper atoms disrupt the orderly arrangement of the layers of aluminium atoms</i><br>2. Lapisan atom sukar untuk menggelongsor di antara satu sama lain apabila daya dikenakan<br><i>The layers of atoms are difficult to slide over one another when a force is applied.</i><br>3. Maka, duralumin adalah lebih keras daripada aluminium.<br><i>Therefore, duralumin is harder than aluminium.</i> | 1<br><br>1<br><br>1 | <br><br><br>3 |
|    |     | Jumlah                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6                   |               |

| No                                        |                        |                        | Rubric                                                                                                                                                                                                                                                                                                                                                                                                       | Mark | Total marks |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|-------------------------------------------|------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|----------|--------------------|-----|-----|---------------------------------------|------------------------|------------------------|-------------------------------------------|---|---|---------------------|---------------|
| 5                                         | (a)                    | (i)                    | Formula yang menunjukkan nisbah paling ringkas atom bagi setiap unsur dalam suatu sebatian.<br><i>A formula that shows a simplest ratio of atoms of each element in a compound.</i>                                                                                                                                                                                                                          | 1    | 1           |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           |                        | (ii)                   | Magnesium/ Aluminium/ Zink// <i>Magnesium/ Aluminium/ Zinc//</i><br>Mg/ Al/ Zn                                                                                                                                                                                                                                                                                                                               | 1    | 1           |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           |                        | (iii)                  | Ulang proses pemanasan , penyejukan dan penimbangan sehingga jisim tetap diperolehi<br><i>Repeat the process of heating , cooling and weighing until a constant mass is obtained.</i>                                                                                                                                                                                                                        | 1    | 1           |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           |                        | (iv)                   | <table><tr><td></td><td><b>X</b></td><td><b>O</b></td></tr><tr><td>Jisim (g)/Mass (g)</td><td>2.4</td><td>1.6</td></tr><tr><td>Bilangan mol<br/><i>Number of mole</i></td><td><math>\frac{2.4}{24} = 0.1</math></td><td><math>\frac{1.6}{16} = 0.1</math></td></tr><tr><td>Nisbah teringkas<br/><i>Simplest ratio</i></td><td>1</td><td>1</td></tr></table><br>Formula empirik/ <i>Empirical formula: XO</i> |      | <b>X</b>    | <b>O</b> | Jisim (g)/Mass (g) | 2.4 | 1.6 | Bilangan mol<br><i>Number of mole</i> | $\frac{2.4}{24} = 0.1$ | $\frac{1.6}{16} = 0.1$ | Nisbah teringkas<br><i>Simplest ratio</i> | 1 | 1 | 1<br><br>1<br><br>1 | <br><br><br>3 |
|                                           | <b>X</b>               | <b>O</b>               |                                                                                                                                                                                                                                                                                                                                                                                                              |      |             |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
| Jisim (g)/Mass (g)                        | 2.4                    | 1.6                    |                                                                                                                                                                                                                                                                                                                                                                                                              |      |             |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
| Bilangan mol<br><i>Number of mole</i>     | $\frac{2.4}{24} = 0.1$ | $\frac{1.6}{16} = 0.1$ |                                                                                                                                                                                                                                                                                                                                                                                                              |      |             |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
| Nisbah teringkas<br><i>Simplest ratio</i> | 1                      | 1                      |                                                                                                                                                                                                                                                                                                                                                                                                              |      |             |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           | (b)                    | (i)                    | Tidak boleh // <i>Cannot</i>                                                                                                                                                                                                                                                                                                                                                                                 | 1    | 1           |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           |                        | (ii)                   | Plumbum kurang reaktif terhadap oksigen<br><i>Lead is less reactive towards oxygen</i>                                                                                                                                                                                                                                                                                                                       | 1    | 1           |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |
|                                           |                        |                        | Jumlah                                                                                                                                                                                                                                                                                                                                                                                                       | 8    |             |          |                    |     |     |                                       |                        |                        |                                           |   |   |                     |               |



| No |     |       | Rubric                                                                                                                                                                                                                                                                                                                                                                                             | Mark                 | Total marks |
|----|-----|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|
| 6  | (a) |       | Tindak balas eksotermik<br><i>Exothermic reaction</i>                                                                                                                                                                                                                                                                                                                                              | 1                    | 1           |
|    | (b) | (i)   | Haba dibebaskan, Q/ <i>Heat released, Q</i><br>= (200)(4.2)(59.0 – 28.0)<br>= 26 040 J // 26.04 kJ                                                                                                                                                                                                                                                                                                 | 1                    | 1           |
|    |     | (ii)  | Mol propanol/ <i>Moles of propanol</i><br>= (30.69-29.85)/60<br>= 0.014 mol                                                                                                                                                                                                                                                                                                                        | 1                    | 1           |
|    |     | (iii) | $\Delta H = \frac{Q}{n}$<br>= $\frac{26.04 \text{ kJ}}{0.014 \text{ mol}}$<br>= -1860 kJmol <sup>-1</sup>                                                                                                                                                                                                                                                                                          | 1<br>1               | 2           |
|    | (c) | (i)   | 1. Nilai bahan api etanol = $\frac{1380 \text{ kJ mol}^{-1}}{46}$ // 30 kJ g <sup>-1</sup><br><i>Fuel value of ethanol</i><br>2. Nilai bahan api gas hidrogen = $\frac{286 \text{ kJ mol}^{-1}}{2}$ // 143 kJ g <sup>-1</sup><br><i>Fuel value of hydrogen gas</i>                                                                                                                                 | 1<br>1               | 2           |
|    |     | (ii)  | 1. Gas hidrogen // <i>hydrogen gas</i><br>2. Nilai bahan api yang lebih tinggi// Pembakaran gas hidrogen tidak mencemarkan alam sekitar// <i>Higher fuel value// Combustion of hydrogen gas does not pollute environment.</i><br><br>Atau // Or<br>1. Etanol// <i>Ethanol</i><br>2. Pembakaran etanol tidak mencemarkan alam sekitar<br><i>Combustion of ethanol does not pollute environment.</i> | 1<br>1<br><br>1<br>1 | 2           |
|    |     |       | Jumlah                                                                                                                                                                                                                                                                                                                                                                                             | 9                    |             |

| No |     |       | Rubric                                                                                                                                                                                                                    | Mark        | Total marks |
|----|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 7  | (a) | (i)   | Bahan kimia yang mengion dalam air untuk membentuk ion H <sup>+</sup><br><i>A chemical substance that ionises in water to produce H<sup>+</sup> ion</i>                                                                   | 1           | 1           |
|    |     | (ii)  | HCl + KOH → KCl + H <sub>2</sub> O                                                                                                                                                                                        | 1           | 1           |
|    |     | (iii) | 1. Bilangan mol/ <i>Number of mol</i><br>= $\frac{(0.5 \times 25)}{1000}$<br>= 0.0125 mol<br><br>2. Isi padu asid / <i>Volume of acid</i><br>$\frac{0.5 \times V_a}{0.5 \times 25} = 1$<br><br>3. $V_a = 25 \text{ cm}^3$ | 1<br>1<br>1 | 3           |
|    |     | (iv)  | Asid sulfurik/ <i>Sulphuric acid</i>                                                                                                                                                                                      | 1           | 1           |



|  |     |       |                                                                                                                                |        |   |
|--|-----|-------|--------------------------------------------------------------------------------------------------------------------------------|--------|---|
|  | (b) | (i)   | Tindak balas penguraian ganda dua /tindak balas pemendakan<br>// <i>Double decomposition reaction / precipitation reaction</i> | 1      | 1 |
|  |     | (ii)  | $\text{NO}_3^-$ r: ion nitrat// <i>nitrate ion</i>                                                                             | 1      | 1 |
|  |     | (iii) | Pepejal X : Plumbum(II) sulfat r : $\text{Pb}(\text{SO}_4)$<br>Larutan Y : Natrium klorida r : $\text{NaCl}$                   | 1<br>1 | 2 |
|  |     |       | Jumlah                                                                                                                         | 10     |   |

| No |     |       | Rubric                                                                                                                                                                                                                                              | Mark   | Total marks |
|----|-----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------|
| 8  | (a) | (i)   | Ikatan kovalen// <i>covalent bond</i>                                                                                                                                                                                                               | 1      | 1           |
|    |     | (ii)  | Tidak boleh// <i>cannot</i>                                                                                                                                                                                                                         | 1      | 1           |
|    |     | (iii) | 1. Sebatian X terdiri daripada molekul neutral/ tiada ion yang bebas bergerak//<br><i>compound X consists of neutral molecules / no free moving ion in compound</i><br>2. tidak boleh membawa cas elektrik<br><i>cannot carry electrical charge</i> | 1<br>1 | 2           |
|    | (b) | (i)   | Etanol// <i>ethanol</i> r: formula                                                                                                                                                                                                                  | 1      | 1           |
|    |     | (ii)  | I : pengoksidaan// <i>oxidation</i><br>II : pengesteran// <i>esterification</i>                                                                                                                                                                     | 1<br>1 | 2           |
|    |     | (iii) | Etil etanoat // <i>ethyl ethanoate</i> // $\text{CH}_3\text{COOC}_2\text{H}_5$                                                                                                                                                                      | 1      | 1           |
|    |     | (iv)  | 1. Formula kimia bahan dan hasil tindak balas<br>2. Persamaan seimbang<br>$\text{C}_2\text{H}_5\text{OH} + 2[\text{O}] \rightarrow \text{CH}_3\text{COOH}$                                                                                          | 1<br>1 | 2           |
|    |     |       | Jumlah                                                                                                                                                                                                                                              |        |             |



SERTAI TELEGRAM @exercise\_students

| No |     |       | Rubric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Marks                 | Total Marks |
|----|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------|
| 9  | (a) | (i)   | Satu pengukuran logaritma ke atas kepekatan ion hidrogen yang terkandung dalam suatu larutan akueus.<br><i>A logarithmic measure of the concentration of hydrogen ions in an aqueous solution.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                     | 1           |
|    |     | (ii)  | pH + pOH = 14<br>pOH = 14 - 12<br>= 2<br>pOH = -log [OH <sup>-</sup> ]<br>[OH <sup>-</sup> ] = 10 <sup>-2</sup><br>= 0.01 mol dm <sup>-3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1<br><br>1            | 2           |
|    |     | (iii) | 1. Kaedah A / Method A<br>2. Suhu air panas lebih tinggi daripada air sejuk.<br><i>The temperature of hot water is higher than the temperature of cold water</i><br>3. Tenaga kinetik molekul air panas lebih tinggi berbanding air sejuk.<br><i>Kinetic energy of hot water molecule is higher than cold water.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1<br>1<br>1           | 3           |
|    | (b) |       | 1. Sampel air sungai C mengandungi asid kuat.<br><i>The river water sample C contains strong acid.</i><br>2. Asid kuat mengion lengkap dalam air menghasilkan kepekatan ion H <sup>+</sup> yang tinggi.<br><i>Strong acid ionise completely in water to produce high concentration of H<sup>+</sup> ions</i><br>3. Sampel air sungai D mengandungi asid lemah.<br><i>The river water sample D contains weak acid.</i><br>4. Asid lemah mengion separa lengkap dalam air menghasilkan kepekatan ion H <sup>+</sup> yang rendah.<br><i>Weak acid ionise partially in water to produce low concentration of H<sup>+</sup> ions</i><br>5. Semakin tinggi kepekatan ion H <sup>+</sup> , semakin rendah nilai pH<br><i>The higher the concentration of H<sup>+</sup> ions, the lower the pH value.</i> | 1<br>1<br>1<br>1<br>1 | 5           |
|    | (c) | (i)   | II, I, III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1                     | 1           |
|    |     | (ii)  | 1. faktor saiz<br><i>Factor size</i><br>2. Formula kimia yang betul<br><i>Correct chemical formula</i><br>3. persamaan kimia yang seimbang<br><i>Balanced chemical equation</i><br><br>Jawapan/ Answer:<br><chem>CaCO3 + H2SO4 -&gt; CaSO4 + CO2 + H2O</chem>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1<br>1<br>1           | 3           |



|  |  |       |                                                                                                                                                                                                                                                                              |   |           |
|--|--|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------|
|  |  | (iii) | 1. Asid hidroklorik ialah asid monoprotik manakala asid sulfurik ialah asid diprotik.<br><i>Hydrochloric acid is monoprotic acid while sulphuric acid is diprotic acid.</i>                                                                                                  | 1 |           |
|  |  |       | 2. Kepekatan ion $H^+$ dalam asid sulfurik dalam eksperimen III adalah dua kali ganda daripada asid hidroklorik dalam eksperimen I.<br><i>Concentration of <math>H^+</math> ions in sulphuric acid in experiment III is doubled than hydrochloric acid in experiment II.</i> | 1 |           |
|  |  |       | 3. Bilangan ion $H^+$ per unit isipadu eksperimen III lebih tinggi daripada eksperimen II<br><i>Number of <math>H^+</math> ions per unit volume in experiments III is higher than experiment II.</i>                                                                         | 1 |           |
|  |  |       | 4. Frekuensi perlanggaran antara ion $H^+$ dengan $CaCO_3$ dalam eksperimen III lebih tinggi.<br><i>Frequency of collision between <math>H^+</math> ions and <math>CaCO_3</math> in experiment III is higher.</i>                                                            | 1 |           |
|  |  |       | 5. Frekuensi perlanggaran berkesan eksperimen III lebih tinggi.<br><i>Frequency of effective collision experiment III is higher.</i>                                                                                                                                         | 1 | 5         |
|  |  |       | <b>JUMLAH</b>                                                                                                                                                                                                                                                                |   | <b>20</b> |

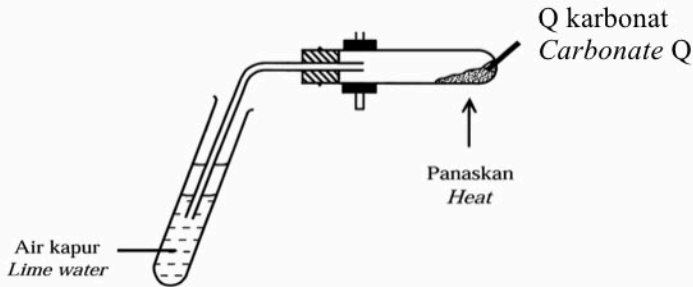
| No |     | Rubric |                                                                                                                                                                                                                                                                       | Mark | Total marks |
|----|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|
| 10 | (a) | (i)    | 1. Pengoksidaan ialah tindak balas kimia di mana bahan mengalami peningkatan nombor pengoksidaan<br><i>Oxidation is a chemical reaction which is substances undergoes increase in oxidation number.</i>                                                               | 1    | 2           |
|    |     |        | 2. Penurunan ialah tindak balas kimia di mana bahan mengalami penurunan nombor pengoksidaan<br><i>Reduction is a chemical reaction which is substances undergoes decrease in oxidation number.</i>                                                                    | 1    |             |
|    |     | (ii)   | 1. $Ag^+ // AgNO_3 //$ ion argentum // silver ion                                                                                                                                                                                                                     | 1    | 3           |
|    |     |        | 2. Nilai $E^0 Ag^+$ lebih positif daripada Nilai $E^0 Cu^{2+}$<br><i><math>E^0</math> value of <math>Ag^+</math> is more positive than <math>E^0</math> value of <math>Cu^{2+}</math></i>                                                                             | 1    |             |
|    |     |        | 3. $Ag^+$ mempunyai kecenderungan yang lebih tinggi untuk menerima elektron untuk membentuk atom $Ag//$ $Ag^+$ mengalami penurunan<br><i><math>Ag^+</math> has greater tendency to receive electrons to form silver atom // <math>Ag^+</math> undergoes reduction</i> | 1    |             |



|        |                                                                                                                                                                                                                                                                                                     |    |    |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| (b)    | 1. Mg // Magnesium                                                                                                                                                                                                                                                                                  | 1  | 5  |
|        | 2. Nilai $E^0$ Mg lebih negatif daripada Nilai $E^0$ Cu<br><i><math>E^0</math> value of Mg is more negative than <math>E^0</math> value of Cu</i>                                                                                                                                                   | 1  |    |
|        | 3. $E^0_{\text{sel}} = (0.34) - (-2.38) \text{ V} // +2.72 \text{ V}$                                                                                                                                                                                                                               | 1  |    |
|        | Mg (p)   $\text{Mg}^{2+}$ (ak)    $\text{Cu}^{2+}$ (ak)   Cu (p)<br>Mg (s)   $\text{Mg}^{2+}$ (aq)    $\text{Cu}^{2+}$ (aq)   Cu (s)                                                                                                                                                                |    |    |
|        | 4. Kedudukan anod dan katod yang betul                                                                                                                                                                                                                                                              | 1  |    |
|        | 5. Sempadan fasa dan titian garam ditunjukkan                                                                                                                                                                                                                                                       | 1  |    |
| (c)    | 1. Logam P : Zn/Mg/Al (mana-mana logam yang lebih elektropositif daripada Fe)<br><i>Metal P : Zn/Mg/Al (any suitable metal that more electropositive than Fe)</i>                                                                                                                                   | 1  | 10 |
|        | 2. Logam Q : Cu/Ag (mana-mana logam yang kurang elektropositif daripada Fe)<br><i>Metal Q : Cu/Ag (any suitable metal that less electropositive than Fe)</i>                                                                                                                                        | 1  |    |
|        | 3. Logam P lebih elektropositif daripada Fe<br><i>Metal P more electropositive than Fe</i>                                                                                                                                                                                                          | 1  |    |
|        | 4. Logam Q kurang elektropositif daripada Fe<br><i>Metal Q more electropositive than Fe</i>                                                                                                                                                                                                         | 1  |    |
|        | 5. Tiada ion $\text{Fe}^{2+}$ // ion $\text{Zn}^{2+}$ / $\text{Mg}^{2+}$ / $\text{Al}^{3+}$ hadir // Pengaratan tidak berlaku<br><i>No <math>\text{Fe}^{2+}</math> // <math>\text{Zn}^{2+}</math> / <math>\text{Mg}^{2+}</math> / <math>\text{Al}^{3+}</math> present // Rusting does not occur</i> | 1  |    |
|        | 6. Logam P dioksidakan<br><i>Metal P is oxidized</i>                                                                                                                                                                                                                                                | 1  |    |
|        | 7. $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$ / $\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$ / $\text{Al} \rightarrow \text{Al}^{3+} + 3\text{e}^-$                                                                                                                               | 1  |    |
|        | 8. Ion $\text{Fe}^{2+}$ hadir // Pengaratan berlaku<br><i><math>\text{Fe}^{2+}</math> present // Rusting occurs</i>                                                                                                                                                                                 | 1  |    |
|        | 9. Paku besi dioksidakan<br><i>Iron is oxidized</i>                                                                                                                                                                                                                                                 | 1  |    |
|        | 10. $\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$                                                                                                                                                                                                                                            | 1  |    |
| JUMLAH |                                                                                                                                                                                                                                                                                                     | 20 |    |



| No                               |                       |                       | Rubric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Mark                    | Total marks |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
|----------------------------------|-----------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|----------|----------|--------------------------|----|------|-------|----------------------------------|----------------------|-----------------------|-------------------------|---------------------------------|-----------------------|-----------------------|-----------------------|---------------------------------------|---|
| 11                               | (a)                   |                       | Formula kimia yang menunjukkan bilangan sebenar atom setiap jenis unsur yang terdapat di dalam satu molekul sesuatu sebatian.<br><i>A chemical formula that shows the actual number of atoms of each type of element present in one molecule of a compound</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1                       | 1           |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
|                                  | (b)                   | (i)                   | <table><tr><td>Unsur<br/><i>Element</i></td><td><b>C</b></td><td><b>H</b></td><td><b>O</b></td></tr><tr><td>Jisim (g)<br/><i>Mass</i></td><td>40</td><td>6.67</td><td>53.33</td></tr><tr><td>Bil mol<br/><i>Number of mole</i></td><td><math>\frac{40}{12}=3.33</math></td><td><math>\frac{6.67}{1}=6.67</math></td><td><math>\frac{53.33}{16}=3.33</math></td></tr><tr><td>Nisbah mol<br/><i>Mole ratio</i></td><td><math>\frac{3.33}{3.33}=1</math></td><td><math>\frac{6.67}{3.33}=2</math></td><td><math>\frac{3.33}{3.33}=1</math></td></tr></table> <p>Formula empirik/ <i>Empirical formula</i> = CH<sub>2</sub>O.</p> <p><math>[12+2(1)+16]n=180</math><br/><math>n=\frac{180}{30}=6</math></p> <p>Formula molekul/ <i>Molecular formula</i> = (CH<sub>2</sub>O)<sub>6</sub><br/>= C<sub>6</sub>H<sub>12</sub>O<sub>6</sub></p>                                             | Unsur<br><i>Element</i> | <b>C</b>    | <b>H</b> | <b>O</b> | Jisim (g)<br><i>Mass</i> | 40 | 6.67 | 53.33 | Bil mol<br><i>Number of mole</i> | $\frac{40}{12}=3.33$ | $\frac{6.67}{1}=6.67$ | $\frac{53.33}{16}=3.33$ | Nisbah mol<br><i>Mole ratio</i> | $\frac{3.33}{3.33}=1$ | $\frac{6.67}{3.33}=2$ | $\frac{3.33}{3.33}=1$ | 1<br><br>1<br><br>1<br><br>1<br><br>1 | 5 |
| Unsur<br><i>Element</i>          | <b>C</b>              | <b>H</b>              | <b>O</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |             |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
| Jisim (g)<br><i>Mass</i>         | 40                    | 6.67                  | 53.33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |             |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
| Bil mol<br><i>Number of mole</i> | $\frac{40}{12}=3.33$  | $\frac{6.67}{1}=6.67$ | $\frac{53.33}{16}=3.33$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |             |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
| Nisbah mol<br><i>Mole ratio</i>  | $\frac{3.33}{3.33}=1$ | $\frac{6.67}{3.33}=2$ | $\frac{3.33}{3.33}=1$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |             |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
|                                  |                       | (ii)                  | <p>Perbezaan:</p> <p>Kedua-dua formula menunjukkan bilangan atom setiap unsur yang berbeza// kedua-dua mempunyai bilangan atom C, bilangan atom O dan bilangan atom H yang berbeza<br/><i>Both formulas show different numbers of atoms of each element // Both have different numbers of carbon atoms, oxygen atoms, and hydrogen atoms</i></p> <p>Formula empirik menunjukkan nisbah paling ringkas bilangan atom C kepada atom H dan atom O dalam satu molekul glukosa ialah 1:2:1<br/>Manakala formula molekul menunjukkan satu molekul glukosa terdiri daripada 6 atom C, 12 atom H dan 6 atom O.<br/><i>The empirical formula shows that the simplest ratio of the number of C atoms to H atoms and O atoms in one molecule of glucose is 1:2:1. Meanwhile, the molecular formula shows that one molecule of glucose consists of 6 C atoms, 12 H atoms, and 6 O atoms</i></p> | 1<br><br>1              | 2           |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |
|                                  | (c)                   |                       | <p>1. Logam X: Magnesium // aluminium // zink<br/>Metal X : <i>Magnesium // aluminium // zinc</i></p> <p>2. Logam X lebih reaktif daripada hidrogen // Logam X reaktif terhadap oksigen.<br/><i>Metal X is more reactive than hydrogen// Metal X is reactive towards oxygen</i></p> <p>3. Logam Y: kuprum // plumbum // stanum<br/><i>Metal Y: copper // lead // tin</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1<br><br>1<br><br>1     |             |          |          |                          |    |      |       |                                  |                      |                       |                         |                                 |                       |                       |                       |                                       |   |

|     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |    |
|-----|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----|
|     |  | 4. Logam Y kurang reaktif daripada hidrogen // Logam Y kurang reaktif terhadap oksigen<br><i>Metal Y is less reactive than hydrogen// Metal Y is less reactive towards oxygen</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                           | 4  |
| (d) |  | 1. Kuprum(II) karbonat// <i>Copper(II) carbonate</i><br>2. Formula bahan dan hasil tindak balas yang betul<br><i>Correct formulae of the reactants and products</i><br>3. Persamaan kimia yang seimbang<br><i>Balanced chemical equation</i><br>$\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$<br><br>Prosedur/ <i>Procedure:</i><br>4. Isi satu spatula garam Q karbonat ke dalam tabung didih.<br><i>Put one spatula of carbonate salt Q into a boiling tube</i><br>5. Panaskan garam Q karbonat dan alirkan gas yang terhasil ke dalam air kapur<br><i>Heat carbonate salt Q and pass the gas produced into limewater</i><br>6. Rekodkan pemerhatian<br><i>Record the observations</i><br>7. Gambar rajah berlabel<br><i>Labelled diagram</i><br>8. Gambar rajah berfungsi<br><i>Functional diagram</i> | 1<br>1<br>1<br><br><br><br>1<br>1<br>1<br>1 |    |
|     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |    |
|     |  | Jumlah markah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 20                                          | 20 |

