

# SKEMA PEMARKAHAN MPP3 KERTAS 1

KIMIA 4541/1

| NO | JAWAPAN | NO | JAWAPAN |
|----|---------|----|---------|
| 1  | A       | 21 | C       |
| 2  | D       | 22 | D       |
| 3  | C       | 23 | C       |
| 4  | C       | 24 | A       |
| 5  | D       | 25 | B       |
| 6  | A       | 26 | B       |
| 7  | B       | 27 | A       |
| 8  | D       | 28 | A       |
| 9  | C       | 29 | C       |
| 10 | B       | 30 | A       |
| 11 | D       | 31 | A       |
| 12 | B       | 32 | A       |
| 13 | B       | 33 | B       |
| 14 | B       | 34 | A       |
| 15 | D       | 35 | D       |
| 16 | D       | 36 | B       |
| 17 | A       | 37 | C       |
| 18 | D       | 38 | C       |
| 19 | C       | 39 | B       |
| 20 | D       | 40 | D       |



SKEMA PEMARKAHAN KIMIA 2  
MPP 3 TINGKATAN 5  
TAHUN 2024

| Nombor soalan |     |      | Rubrik                                                                                                                                                                                  | Sub markah | Markah |
|---------------|-----|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|
| 1             | (a) |      | Ubat ialah bahan kimia yang digunakan untuk membantu kita merawat atau mencegah penyakit //<br><i>Medicines are chemical used to help with the treatment or prevention of diseases.</i> |            | 1      |
|               | (b) |      | Ubat Tradisional<br><i>Traditional medicine</i>                                                                                                                                         | 1          | 2      |
|               |     |      | Ubat Moden<br><i>Modern medicine</i>                                                                                                                                                    | 1          |        |
|               | (c) | (i)  | Senang didapati // Murah // Tiada kesan sampingan<br><i>Easy to find // Cheap // No side effect</i>                                                                                     |            | 1      |
|               |     | (ii) | Hancurkan/ rebus halia//<br><i>Crush/ boil the ginger</i>                                                                                                                               |            | 1      |
|               |     |      | JUMLAH                                                                                                                                                                                  | 5          |        |

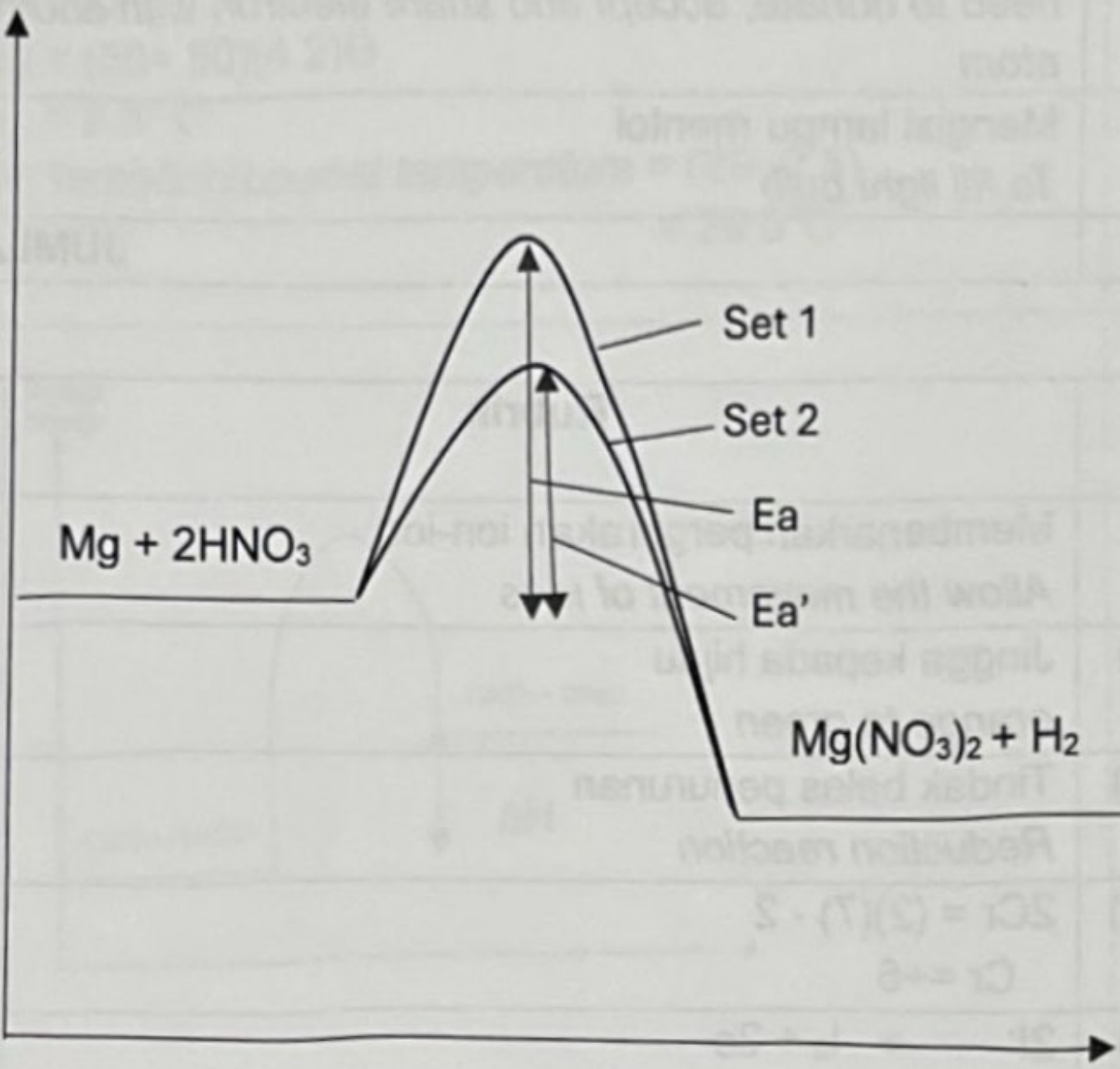
| Nombor soalan |     |      | Rubrik                                                                                                                                            | Sub markah | Markah |
|---------------|-----|------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|
| 2             | (a) |      | Molekul<br><i>Molecule</i>                                                                                                                        |            | 1      |
|               | (b) | (i)  | Memastikan pemanasan sekata<br><i>To ensure even heating</i>                                                                                      |            | 1      |
|               |     | (ii) | 43.8 °C                                                                                                                                           |            | 1      |
|               | (c) | (i)  | Air<br><i>Water</i>                                                                                                                               |            | 1      |
|               |     | (ii) | Takat lebur asid laurik lebih rendah daripada takat didih air<br><i>The melting point of lauric acid is lower than the boiling point of water</i> |            | 1      |
|               |     |      |                                                                                                                                                   | JUMLAH     | 5      |



| Nombor soalan |     | Rubrik                                                                                                                                                                                | Sub markah | Markah |
|---------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|
| 3             | (a) | Molekul berantai panjang yang terhasil daripada percantuman banyak ulangan unit asas.<br><i>is a long chain molecule that is made from a combination of many repeating basic unit</i> |            | 1      |
|               | (b) | (i) Pempolimeran kondensasi<br><i>Condensation polymerisation</i>                                                                                                                     |            | 1      |
|               |     | (ii) Hidrogen klorida<br><i>Hydrogen chloride</i>                                                                                                                                     |            | 1      |
|               | (c) | Ringan // kuat // keras (mana-mana dua)<br><i>lightweight // strong // hard</i>                                                                                                       | 1<br>1     | 2      |
|               | (d) | Membolehkan barangan plastik terurai secara semula jadi oleh bakteria<br><i>Enable plastic to decompose naturally by bacteria</i>                                                     |            | 1      |
| JUMLAH        |     |                                                                                                                                                                                       |            | 6      |

| No. Soalan      |                                               |                 | Rubrik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Markah |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|-----------------|-----------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|---|---|----------|-------|-------|-------|----------|-----------------|-----------------|-----------------|--|----|---|----|--|-------|-------|-------|--|---|----|---|-----------------|-----------------------------------------------|--|--|------------------|---|
| 4               | (a)                                           | (i)             | Isi padu yang ditempati oleh 1 mol gas<br><i>The volume occupied by 1 mol of gas</i>                                                                                                                                                                                                                                                                                                                                                                                                                    |        | 1 |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 |                                               | (ii)            | 1 mol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        | 1 |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 |                                               | (iii)           | 1 mol gas CO <sub>2</sub> berjisim 44 g<br>1 mol of CO <sub>2</sub> gas has mass 44 g                                                                                                                                                                                                                                                                                                                                                                                                                   |        | 1 |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 | (b)                                           |                 | <table><tr><td>Unsur</td><td>C</td><td>H</td><td>O</td></tr><tr><td>Jisim/ g</td><td>64.62</td><td>10.77</td><td>24.61</td></tr><tr><td>Bil. mol</td><td><u>64.62</u> //</td><td><u>10.77</u> //</td><td><u>24.61</u> //</td></tr><tr><td></td><td>12</td><td>1</td><td>16</td></tr><tr><td></td><td>5.385</td><td>10.77</td><td>1.538</td></tr><tr><td></td><td>7</td><td>14</td><td>2</td></tr><tr><td>Formula empirik</td><td colspan="3">C<sub>7</sub>H<sub>14</sub>O<sub>2</sub></td></tr></table> | Unsur  | C | H | O | Jisim/ g | 64.62 | 10.77 | 24.61 | Bil. mol | <u>64.62</u> // | <u>10.77</u> // | <u>24.61</u> // |  | 12 | 1 | 16 |  | 5.385 | 10.77 | 1.538 |  | 7 | 14 | 2 | Formula empirik | C <sub>7</sub> H <sub>14</sub> O <sub>2</sub> |  |  | 1<br>1<br>1<br>1 | 4 |
| Unsur           | C                                             | H               | O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
| Jisim/ g        | 64.62                                         | 10.77           | 24.61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
| Bil. mol        | <u>64.62</u> //                               | <u>10.77</u> // | <u>24.61</u> //                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 | 12                                            | 1               | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 | 5.385                                         | 10.77           | 1.538                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
|                 | 7                                             | 14              | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
| Formula empirik | C <sub>7</sub> H <sub>14</sub> O <sub>2</sub> |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |
| JUMLAH          |                                               |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7      |   |   |   |          |       |       |       |          |                 |                 |                 |  |    |   |    |  |       |       |       |  |   |    |   |                 |                                               |  |  |                  |   |



| Nombor soalan |     |       | Rubrik                                                                                                                                                                                                                                                                                                                                                                     | Markah              |   |
|---------------|-----|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---|
| 5             | (a) | (i)   | Kehadiran mangkin<br><i>Presence of catalyst</i>                                                                                                                                                                                                                                                                                                                           |                     | 1 |
|               |     | (ii)  | Isipadu gas<br><i>Volume of gas</i>                                                                                                                                                                                                                                                                                                                                        |                     | 1 |
|               |     | (iii) | Bil mol $\text{HNO}_3 = 0.5 \times 50 / 1000 = 0.025$<br><br>Nisbah mol $\text{HNO}_3 : \text{Mg}(\text{NO}_3)_2$<br><br>2 mol : 1 mol<br><br>0.025 mol : 0.0125 mol<br><br>Jisim $\text{Mg}(\text{NO}_3)_2 = 0.0125 \times 148 = 1.85\text{g}$                                                                                                                            | 1<br><br>1<br><br>1 | 3 |
|               |     |       |                                                                                                                                                                                                                                                                                                                                                                            |                     |   |
|               | (b) |       | <div><p>Tenaga<br/><i>Energy</i></p><p>Mg + 2HNO<sub>3</sub></p><p>Mg(NO<sub>3</sub>)<sub>2</sub> + H<sub>2</sub></p><p>Set 1</p><p>Set 2</p><p>Ea</p><p>Ea'</p><p>Lintasan tindak balas<br/><i>Reaction progress</i></p><p>Lintasan set II dan label</p><p>Label Ea dan Ea'</p></div> | 1<br><br>1+1        | 3 |
|               |     |       | JUMLAH                                                                                                                                                                                                                                                                                                                                                                     |                     | 8 |



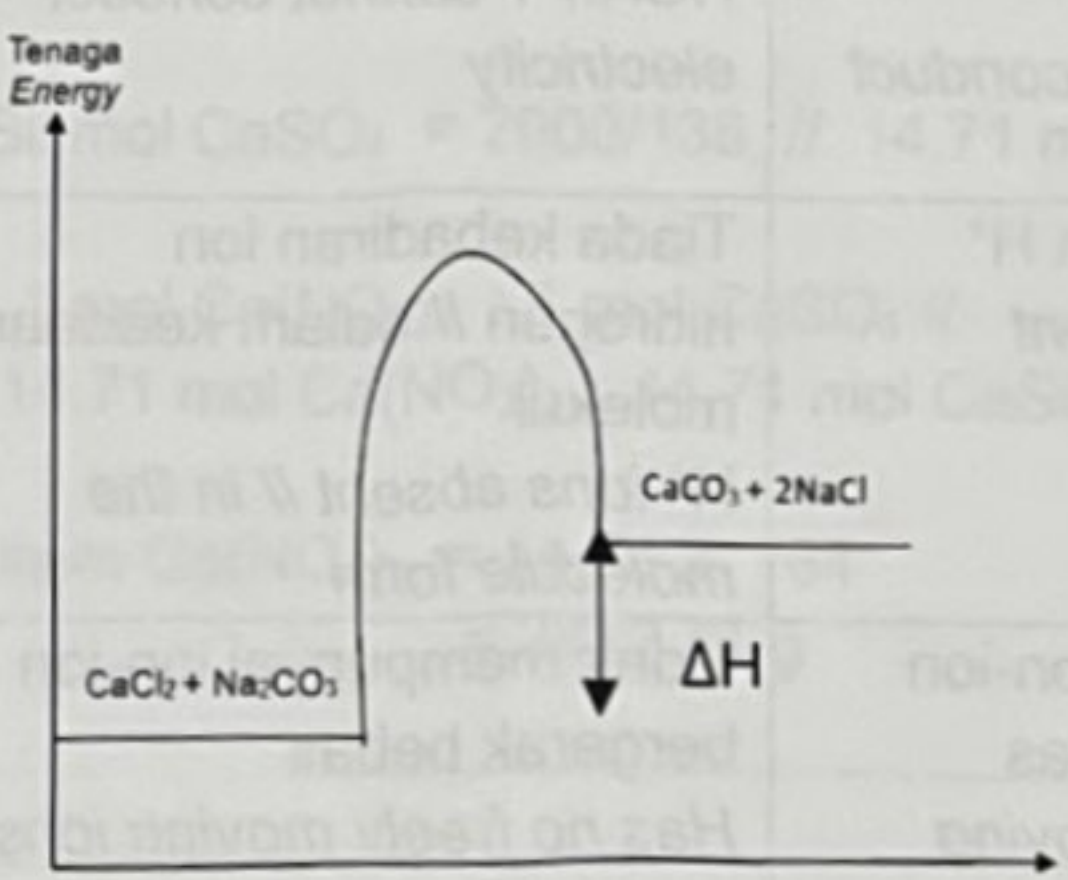


| Nombor soalan |     |      | Rubrik                                                                                                                                                                                                                                            | Sub markah          | markah |
|---------------|-----|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------|
| 6             | (a) | (i)  | 2.8.6                                                                                                                                                                                                                                             |                     | 1      |
|               |     | (ii) | Atom P mempunyai 3 petala yang mengandungi elektron<br><i>Atom P has 3 shells occupied with electrons</i>                                                                                                                                         |                     | 1      |
|               | (b) | (i)  | $3Q_2 + 2Fe \rightarrow 2FeQ_3$ // $3Cl_2 + 2Fe \rightarrow 2FeCl_3$<br><i>Correct formula of reactants and products</i><br><i>[Balanced equation]</i>                                                                                            | 1<br>1              | 2      |
|               |     | (ii) | $Mol = \frac{1.12}{56}$ // 0.02 mol<br><br>2 mol Fe : 3 mol gas Q //<br>0.02 mol Fe : 0.03 mol gas Q<br><br>Isi padu gas Q = $(0.03 \times 24) dm^3$ // $0.72 dm^3$<br><i>Volume gas Q</i><br><br><i>(unit yang betul)</i>                        | 1<br><br>1<br><br>1 | 3      |
|               | (c) | (i)  | Atom R mempunyai susunan elektron oktet // Atom R tidak perlu menderma, menerima dan berkongsi elektron dengan atom lain<br><i>Atom R has octet electron arrangement // Atom R no need to donate, accept and share electron with another atom</i> |                     | 1      |
|               |     | (ii) | Mengisi lampu mentol<br><i>To fill light bulb</i>                                                                                                                                                                                                 |                     | 1      |
| JUMLAH        |     |      |                                                                                                                                                                                                                                                   |                     | 9      |

| No. soalan |     |       | Rubrik                                                                                                                                                                                                        | Sub markah | Markah |
|------------|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|
| 7          | (a) |       | Membenarkan pergerakan ion-ion<br><i>Allow the movement of ions</i>                                                                                                                                           |            | 1      |
|            | (b) | (i)   | Jingga kepada hijau<br><i>orange to green</i>                                                                                                                                                                 |            | 1      |
|            |     | (ii)  | Tindak balas penurunan<br><i>Reduction reaction</i>                                                                                                                                                           |            | 1      |
|            |     | (iii) | $2Cr = (2)(7) - 2$<br>Cr = +6                                                                                                                                                                                 | 1<br>1     | 2      |
|            | (c) | (i)   | $2I^- \longrightarrow I_2 + 2e$                                                                                                                                                                               |            | 1      |
|            |     | (ii)  | Larutan tidak berwarna kepada perang<br><i>Colourless solution to brown</i>                                                                                                                                   |            | 1      |
|            |     | (iii) | Tambah beberapa titik kanji ke dalam larutan hasil Larutan perang bertukar kepada biru tua<br><i>Add a few drops of starch solution into the product solution</i><br><i>Brown solution turns to dark blue</i> | 1<br>1     | 2      |
|            | (d) |       | Larutan kalium manganate(VII) berasid// klorin// bromin// Ferum(III) klorida                                                                                                                                  |            | 1      |



|  |  |                                                                                                                                                    |  |    |
|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------|--|----|
|  |  | (mana-mana agen pengoksidaan )<br>Acidified potassium manganate(VII) solution//<br>chlorine// bromine// iron(III) klorida<br>(Any oxidising agent) |  |    |
|  |  | JUMLAH                                                                                                                                             |  | 10 |

| No.Soalan |     | Rubrik                                                                                                                                                                                                                                                                                                                | Markah                                     |                                           |
|-----------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------|
| 8         | (a) | Perubahan haba apabila 1 mol mendakan terbentuk<br>daripada ion- ionnya di dalam larutan akueus.<br><i>Heat change when 1 mol of precipitation formed from its<br/>ions in aqueous solution</i>                                                                                                                       |                                            | 1                                         |
|           | (b) | Mendakan putih terbentuk<br><i>White precipitate formed</i>                                                                                                                                                                                                                                                           |                                            | 1                                         |
|           | (c) | $\text{Ca}^{2+} + \text{CO}_3^{2-} \rightarrow \text{CaCO}_3$                                                                                                                                                                                                                                                         |                                            | 1                                         |
|           | (d) | (i) Bil. mol/ No. of mol = $\frac{1 \times 50}{1000}$<br><br>= 0.05 mol                                                                                                                                                                                                                                               |                                            | 1                                         |
|           |     | (ii) $Q = 0.05 \times 21000$<br>= 1050 J<br>$1050 = (50+ 50)(4.2)\Theta$<br>$\Theta = 2.5^\circ \text{C}$<br>Suhu terendah/ <i>Lowest temperature</i> = $(29 -2.5)$<br>= $26.5^\circ \text{C}$                                                                                                                        | 1<br><br><br><br><br><br><br><br><br><br>1 | <br><br><br><br><br><br><br><br><br><br>2 |
|           | (e) |                                                                                                                                                                                                                                   |                                            | 1                                         |
|           | (f) | Letakkan pek sejuk pada lutut yang bengkak<br>Untuk menyerap haba dari lututnya yang bengkak<br>Menyebabkan salur darah mengecil dan melambatkan<br>pengaliran darah<br><i>Place the cold packs on his swollen knee<br/>To absorb heat from his swollen knee<br/>Constrict blood vessels and slow down blood flow</i> | 1<br>1<br>1                                | 3                                         |
|           |     | JUMLAH                                                                                                                                                                                                                                                                                                                |                                            | 10                                        |



| Nombor soalan                                               |                                                                                                             | Rubrik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sub markah                                                                              | Markah |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------|---|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------|---|
| 9                                                           | (a)                                                                                                         | 1. Ammonia adalah alkali lemah // mengion separa dalam air menghasilkan kepekatan ion OH <sup>-</sup> yang rendah                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1                                                                                       | 4      |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 2. Natrium hidroksida adalah alkali kuat // mengion lengkap dalam air                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 3. Kepekatan ion OH <sup>-</sup> dalam natrium hidroksida lebih tinggi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 4. Semakin tinggi kepekatan ion OH <sup>-</sup> , semakin tinggi nilai pH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 1. <i>Ammonia is a weak alkali // ionises partially in water to produce low concentration of OH<sup>-</sup> ion</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 2. <i>Sodium hydroxide is a strong alkali // ionises completely in water</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 3. <i>Concentration of OH<sup>-</sup> ion in sodium hydroxide is higher</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | 4. <i>The higher the concentration of OH<sup>-</sup> ion, the higher the pH value</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             | (b)                                                                                                         | (i) Larutan /Solvent X – air / water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                                                                       | 2      |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | Larutan – tetraklorometana// metilbenzena / Solvent Y- Tetrachloromethane // methylbenzene                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             | (ii)                                                                                                        | Set I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | <table><tr><th>X</th><th>Y</th></tr><tr><td>HCl dalam X dapat mengkonduksikan elektrik<br/>HCl in X can conduct electricity</td><td>HCl dalam Y tidak dapat mengkonduksikan elektrik<br/>HCl in Y cannot conduct electricity</td></tr><tr><td>Kehadiran ion H<sup>+</sup><br/>H<sup>+</sup> ions present</td><td>Tiada kehadiran ion hidrogen // dalam keadaan molekul<br/>H<sup>+</sup> ions absent // in the molecule form</td></tr><tr><td>Mempunyai ion-ion bergerak bebas<br/>Has freely moving ions</td><td>Tidak mempunyai ion-ion bergerak bebas<br/>Has no freely moving ions</td></tr></table> | X                                                                                       |        | Y | HCl dalam X dapat mengkonduksikan elektrik<br>HCl in X can conduct electricity | HCl dalam Y tidak dapat mengkonduksikan elektrik<br>HCl in Y cannot conduct electricity | Kehadiran ion H <sup>+</sup><br>H <sup>+</sup> ions present | Tiada kehadiran ion hidrogen // dalam keadaan molekul<br>H <sup>+</sup> ions absent // in the molecule form | Mempunyai ion-ion bergerak bebas<br>Has freely moving ions | Tidak mempunyai ion-ion bergerak bebas<br>Has no freely moving ions | 1 |
|                                                             |                                                                                                             | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Y                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             | HCl dalam X dapat mengkonduksikan elektrik<br>HCl in X can conduct electricity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | HCl dalam Y tidak dapat mengkonduksikan elektrik<br>HCl in Y cannot conduct electricity |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
| Kehadiran ion H <sup>+</sup><br>H <sup>+</sup> ions present | Tiada kehadiran ion hidrogen // dalam keadaan molekul<br>H <sup>+</sup> ions absent // in the molecule form |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
| Mempunyai ion-ion bergerak bebas<br>Has freely moving ions  | Tidak mempunyai ion-ion bergerak bebas<br>Has no freely moving ions                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                         |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |
|                                                             |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                                                                       |        |   |                                                                                |                                                                                         |                                                             |                                                                                                             |                                                            |                                                                     |   |



|                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Set II</p> <table><tr><th>X</th><th>Y</th></tr><tr><td>Ion H<sup>+</sup> hadir<br/>H<sup>+</sup> ions present</td><td>Tiada kehadiran ion hidrogen/ dalam keadaan molekul<br/>H<sup>+</sup> ions absent/ in the molecule form</td></tr><tr><td>HCl menunjukkan sifat asid<br/>HCl shows acidic properties</td><td>HCl tidak dapat menunjukkan sifat asid<br/>HCl cannot show acidic properties.</td></tr><tr><td>Tindak balas berlaku<br/>Reaction occurred</td><td>Tindak balas tidak berlaku<br/>Reaction does not occur.</td></tr></table> <p>Persamaan kimia / Chemical equation :<br/>2HCl + CaCO<sub>3</sub> → CaCl<sub>2</sub> + H<sub>2</sub>O + CO<sub>2</sub><br/>Correct formulae of reactants and products<br/>Balanced equation</p> | X | Y  | Ion H <sup>+</sup> hadir<br>H <sup>+</sup> ions present | Tiada kehadiran ion hidrogen/ dalam keadaan molekul<br>H <sup>+</sup> ions absent/ in the molecule form | HCl menunjukkan sifat asid<br>HCl shows acidic properties | HCl tidak dapat menunjukkan sifat asid<br>HCl cannot show acidic properties. | Tindak balas berlaku<br>Reaction occurred | Tindak balas tidak berlaku<br>Reaction does not occur. | 1<br><br>1<br><br>1<br><br>1<br>1 | 8 |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|-----------------------------------|---|
| X                                                         | Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |    |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |
| Ion H <sup>+</sup> hadir<br>H <sup>+</sup> ions present   | Tiada kehadiran ion hidrogen/ dalam keadaan molekul<br>H <sup>+</sup> ions absent/ in the molecule form                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |    |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |
| HCl menunjukkan sifat asid<br>HCl shows acidic properties | HCl tidak dapat menunjukkan sifat asid<br>HCl cannot show acidic properties.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |    |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |
| Tindak balas berlaku<br>Reaction occurred                 | Tindak balas tidak berlaku<br>Reaction does not occur.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |    |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |
| (c)                                                       | <p>Tindak balas : Penguraian ganda dua<br/>Reaction : Double decomposition reaction</p> <p>Ca(NO<sub>3</sub>)<sub>2</sub> + Na<sub>2</sub>SO<sub>4</sub> → CaSO<sub>4</sub> + 2NaNO<sub>3</sub><br/>1. Correct formulae reactant and product<br/>2. Balanced chemical equation</p> <p>Bil mol CaSO<sub>4</sub> = 2000/136 // 14.71 mol</p> <p>1 mol Ca(NO<sub>3</sub>)<sub>2</sub> : 1 mol CaSO<sub>4</sub> //<br/>14.71 mol Ca(NO<sub>3</sub>)<sub>2</sub> : 14.71 mol CaSO<sub>4</sub></p> <p>Jisim Ca(NO<sub>3</sub>)<sub>2</sub> = 14.71 x 164<br/>= 2412.44 g</p> | 1<br><br>1<br>1<br><br>1<br><br>1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6 |    |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |
|                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | JUMLAH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   | 20 |                                                         |                                                                                                         |                                                           |                                                                              |                                           |                                                        |                                   |   |



| Nombor soalan                                                                                       |                                                                                                                                                                                                                                                                                                                                                             |                              | Rubrik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sub markah                                                                   | Markah |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------|-------------------------------|------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|
| 10                                                                                                  | (a)                                                                                                                                                                                                                                                                                                                                                         | (i)                          | Bahan P : sebatian kovalen<br>Bahan Q : sebatian ion<br><i>Substance P : covalent compound</i><br><i>Substance Q : ionic compound</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1<br>1                                                                       | 6      |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                              | <table><tr><th>Bahan P<br/><i>Substance P</i></th><th>Bahan Q<br/><i>Substance Q</i></th></tr><tr><td>Takat lebur rendah<br/><i>Melting point low</i></td><td>Takat lebur tinggi<br/><i>Melting point high</i></td></tr><tr><td>Daya / daya Van der Waals antara molekul yang lemah<br/><i>Weak attraction force / Van der Waals force between molecules</i></td><td>Daya antara ion-ion yang kuat<br/><i>Strong attraction force between ions</i></td></tr><tr><td>Sedikit haba diperlukan untuk mengatasi daya itu<br/><i>Low heat is needed to overcome the force</i></td><td>Banyak haba diperlukan untuk mengatasi daya itu<br/><i>More heat is needed to overcome the force</i></td></tr></table> | Bahan P<br><i>Substance P</i>                                                |        | Bahan Q<br><i>Substance Q</i> | Takat lebur rendah<br><i>Melting point low</i> | Takat lebur tinggi<br><i>Melting point high</i> | Daya / daya Van der Waals antara molekul yang lemah<br><i>Weak attraction force / Van der Waals force between molecules</i> | Daya antara ion-ion yang kuat<br><i>Strong attraction force between ions</i> | Sedikit haba diperlukan untuk mengatasi daya itu<br><i>Low heat is needed to overcome the force</i> | Banyak haba diperlukan untuk mengatasi daya itu<br><i>More heat is needed to overcome the force</i> | 1<br><br>1+1<br><br>1 |
|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                              | Bahan P<br><i>Substance P</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bahan Q<br><i>Substance Q</i>                                                |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                              | Takat lebur rendah<br><i>Melting point low</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Takat lebur tinggi<br><i>Melting point high</i>                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                              | Daya / daya Van der Waals antara molekul yang lemah<br><i>Weak attraction force / Van der Waals force between molecules</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Daya antara ion-ion yang kuat<br><i>Strong attraction force between ions</i> |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
| Sedikit haba diperlukan untuk mengatasi daya itu<br><i>Low heat is needed to overcome the force</i> | Banyak haba diperlukan untuk mengatasi daya itu<br><i>More heat is needed to overcome the force</i>                                                                                                                                                                                                                                                         |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
| (ii)                                                                                                | W dan X<br>Susunan elektron atom W 2.4 dan atom X 2.6<br>Atom W perlu 4 elektron dan Atom X perlu 2 elektron untuk mencapai susunan electron oktet.<br>Atom W menyumbangkan empat elektron manakala setiap atom X menyumbangkan dua elektron untuk dikongsi<br>Satu atom W berkongsi 4 pasang elektron dengan dua atom X membentuk sebatian WX <sub>2</sub> | 1+1<br>1<br>1<br>1<br>1<br>1 | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     | [ bilangan unsur yang bergabung dan bilangan elektron setiap petala betul ]                                                                                                                                                                                                                                                                                 | 1                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |
|                                                                                                     | [ bilangan elektron yang dikongsi bersama betul ]                                                                                                                                                                                                                                                                                                           | 1                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                              |        |                               |                                                |                                                 |                                                                                                                             |                                                                              |                                                                                                     |                                                                                                     |                       |



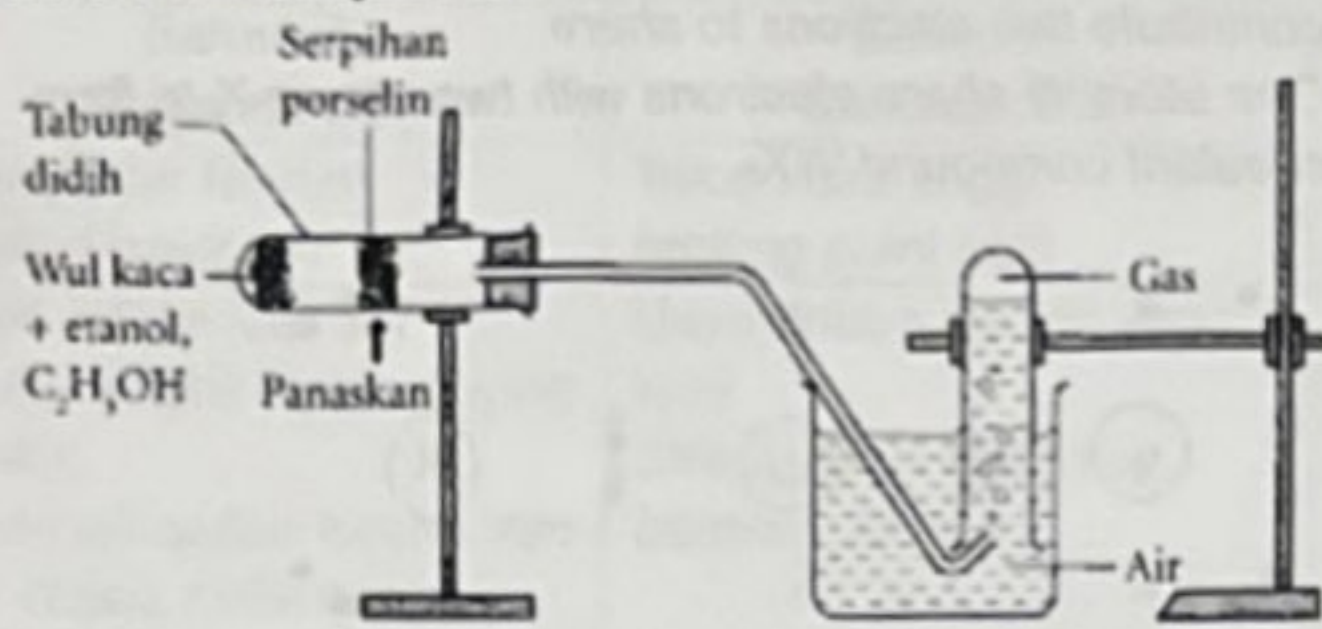
|  |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |    |
|--|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|
|  |     | <p>W and X</p> <p>Electron arrangement of atom W 2.4 and atom X 2.6</p> <p>Atom W need 4 electron and atom X needs 2 electrons to achieve octet electron arrangement</p> <p>Atom W contribute four electrons while each atom X contribute two electrons to share</p> <p>One atom W share electrons with two atoms X to form covalent compound WX<sub>2</sub></p>  <p>[ number of elements combine and number of electrons occupied in each shells correctly]</p> <p>[ number of electrons sharing together]</p> |                               |    |
|  | (b) | <p><math>V + Cl_2 \rightarrow VCl_2</math> // <math>Mg + Cl_2 \rightarrow MgCl_2</math></p> <p>[ formula betul dan persamaan kimia seimbang]</p> <p>[ correct formula and balance chemical equation]</p> <p>Mol V = <math>4.8 / 24</math> // 0.2 mol</p> <p>1 mol V <math>\rightarrow</math> 1 mol <math>VCl_2</math> //</p> <p>0.2 mol V <math>\rightarrow</math> 0.2 mol <math>VCl_2</math></p> <p>Jisim = <math>0.2 [ 24 + (35.5 \times 2)]g</math> // 19.0 g</p>                                                                                                                               | 1<br>1<br><br>1<br>1<br><br>1 | 5  |
|  |     | JUMLAH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                               | 20 |

Handwritten calculations:

$15$   
 $58$   
 $73$

$73$   
 $30$   
 $6$



| Nombor soalan |         | Rubrik                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Markah                                  |   |
|---------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---|
| 11            | (a)     | <p>Hidroksil<br/><i>Hydroxyl</i><br/>Tindak balas M – Penghidratan<br/><i>Reaction M - Hydration</i><br/>Tindak balas N – Pendehidratan<br/><i>Reaction N - Dehydration</i></p>  <p>- Gambarajah berfungsi<br/>- Berlabel</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1<br>1<br>1<br><br>1<br>1               | 5 |
|               | (b) (i) | <p>R- etanol // <i>ethanol</i> // <math>C_2H_5OH</math><br/>S- asid etanoik // <i>ethanoic acid</i> // <math>CH_3COOH</math><br/>T- etil etanoat // <i>ethyl ethanoate</i> // <math>CH_3COOC_2H_5</math></p> <p>R:</p> $\begin{array}{c} \text{H} \quad \text{H} \\   \quad   \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{H} \\   \quad   \\ \text{H} \quad \text{H} \end{array}$ <p>S:</p> $\begin{array}{c} \text{H} \quad \text{O} \\   \quad // \\ \text{H}-\text{C}-\text{C} \\   \quad   \\ \text{H} \quad \text{O}-\text{H} \end{array}$                                                                                                                                                                                                                                                 | 1<br>1<br>1<br><br>1<br><br>1           | 5 |
|               | (ii)    | <p>1. Pengesteran<br/><i>Esterification</i><br/>2. Masukkan 2 cm<sup>3</sup> asid etanoik glasial ke dalam tabung didih.<br/><i>Add 2 cm<sup>3</sup> glacial ethanoic acid into boiling tube.</i><br/>3. Tambahkan 4 cm<sup>3</sup> etanol mutlak ke dalam asid etanoik.<br/><i>Add 4 cm<sup>3</sup> absolute ethanol into ethanoic acid</i><br/>4. Tambahkan 5 titis asid sulfurik pekat ke dalam campuran dan goncangkan.<br/><i>Add 5 drops of concentrated sulphuric acid into the mixture and shake.</i><br/>5. Panaskan campuran dengan perlahan-lahan.<br/><i>Heat the mixture gently</i><br/>6. Tuang campuran ke dalam bikar berisi air<br/><i>Pour the mixture into the beaker half filled with water</i><br/>7. <math>C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O</math></p> | 1<br><br>1<br><br>1<br><br>1<br><br>1+1 |   |



|  |  |                                                                                                             |   |    |
|--|--|-------------------------------------------------------------------------------------------------------------|---|----|
|  |  | 8. Nisbah mol :<br>1 mol $C_2H_5OH$ : 1 mol $CH_3COOC_2H_5$<br>0.5 mol $C_2H_5OH$ : 0.5 mol $CH_3COOC_2H_5$ | 1 |    |
|  |  | 9. Jisim etil etanoat = $(0.5 \times 88)g // 44 g$<br>Mass of ethyl ethanoate                               | 1 | 10 |
|  |  | JUMLAH                                                                                                      |   | 20 |

harir  $27 + 59 + 4 = 57$   
 umairah  $22 + 47 + 7 = 49$   
 agillah  $29 + 54 + 6 = 57$   
 ulwailah  $37 + 77 + 6 = 78$





## Soalan 1 / Question 1

15 markah / 15 marks

| Question Number | Rubric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sub marks                           | Marks |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|
| 1 (a)           | <p>Dapat menyenaraikan semua prosedur dengan betul<br/><i>Able to state all steps in the procedure correctly.</i></p> <ol style="list-style-type: none"> <li>Gosok kepingan kuprum dan X dengan menggunakan kertas pasir</li> <li>Letakkan kepingan kuprum dan X pada kertas kadbod</li> <li>Sambungkan kedua-dua kepingan logam kepada voltmeter menggunakan wayar penyambung</li> <li>Sukat dan tuang [30- 50] cm<sup>3</sup> larutan CuSO<sub>4</sub> ke dalam bikar.</li> <li>Celupkan kedua-dua kepingan logam ke dalam larutan kuprum(II) sulfat.</li> <li>Catatkan bacaan voltmeter</li> <li>Ulang Langkah 1 – 6 dengan menggantikan kepingan X dengan kepingan Y dan Z</li> </ol> <p>1. Rub the copper plate and X with sandpaper<br/>2. Place the copper plate and the X on the cardboard<br/>3. Connect the two pieces of metal plate to the voltmeter using a connecting wire.<br/>4. Measure and pour [30 -50] cm<sup>3</sup> of CuSO<sub>4</sub> solution into the beaker.<br/>5. Dip both metal plate into the copper(II) sulphate solution<br/>6. Record the voltmeter reading<br/>7. Repeat Steps 1 – 5 by replacing the X plate with Y and Z plate</p> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> | 4     |
|                 | Dapat menyenaraikan langkah 1,3,5 dan 6<br><i>Able to list step 1,3,4 and 5</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                     | 3     |
|                 | Dapat menyenaraikan langkah 1,3 dan 5<br><i>Able to list step 1,3 and 5</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                     | 2     |
|                 | Dapat menyenaraikan langkah 3 dan 5<br><i>Able to list step 3 and 4</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                     | 1     |



| Question Number                        |                                                      | Rubric                                                                                                                                                                                                                                                                                                                                                                     | Sub marks                              | Marks |                                                      |                                     |               |                                     |               |
|----------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------|------------------------------------------------------|-------------------------------------|---------------|-------------------------------------|---------------|
| (b)                                    | (i)                                                  | Dapat membina jadual dan merekod data dengan betul<br><i>Able to draw a table and record the data correctly;</i>                                                                                                                                                                                                                                                           |                                        | 4     |                                                      |                                     |               |                                     |               |
|                                        |                                                      | 1. Tajuk/ <i>Title</i>                                                                                                                                                                                                                                                                                                                                                     | 1                                      |       |                                                      |                                     |               |                                     |               |
|                                        |                                                      | 2. Unit/ <i>Unit</i>                                                                                                                                                                                                                                                                                                                                                       | 1                                      |       |                                                      |                                     |               |                                     |               |
|                                        |                                                      | 3. 1 atau 2 titik perpuluhan dengan seragam/<br><i>1 or 2 uniform decimal places</i>                                                                                                                                                                                                                                                                                       | 1                                      |       |                                                      |                                     |               |                                     |               |
|                                        |                                                      | 4. Bacaan voltmeter yang betul<br><i>Correct voltmeter reading.</i>                                                                                                                                                                                                                                                                                                        | 1                                      |       |                                                      |                                     |               |                                     |               |
|                                        |                                                      | <table><tr><th>Pasangan logam<br/><i>Pair of metal</i></th><th>Bacaan Voltmeter (V)<br/><i>Voltmeter reading (V)</i></th></tr><tr><td>Kepingan Cu dan X<br/>Cu and X plate</td><td>[0.50 – 1.00]</td></tr><tr><td>Kepingan Cu dan Y<br/>Cu and Y plate</td><td>[1.30 – 1.60]</td></tr><tr><td>Kepingan Cu dan Z<br/>Cu and Z plate</td><td>[0.10 – 0.45]</td></tr></table> | Pasangan logam<br><i>Pair of metal</i> |       | Bacaan Voltmeter (V)<br><i>Voltmeter reading (V)</i> | Kepingan Cu dan X<br>Cu and X plate | [0.50 – 1.00] | Kepingan Cu dan Y<br>Cu and Y plate | [1.30 – 1.60] |
| Pasangan logam<br><i>Pair of metal</i> | Bacaan Voltmeter (V)<br><i>Voltmeter reading (V)</i> |                                                                                                                                                                                                                                                                                                                                                                            |                                        |       |                                                      |                                     |               |                                     |               |
| Kepingan Cu dan X<br>Cu and X plate    | [0.50 – 1.00]                                        |                                                                                                                                                                                                                                                                                                                                                                            |                                        |       |                                                      |                                     |               |                                     |               |
| Kepingan Cu dan Y<br>Cu and Y plate    | [1.30 – 1.60]                                        |                                                                                                                                                                                                                                                                                                                                                                            |                                        |       |                                                      |                                     |               |                                     |               |
| Kepingan Cu dan Z<br>Cu and Z plate    | [0.10 – 0.45]                                        |                                                                                                                                                                                                                                                                                                                                                                            |                                        |       |                                                      |                                     |               |                                     |               |
|                                        | (ii)                                                 | Dapat menyatakan pemerhatian dengan tepat<br><i>Able to state the observation correctly.</i><br><br>Contoh jawapan:<br>1. Jarum voltmeter terpesong<br><br><i>Sample answer:</i><br>1. <i>Voltmeter needle deflect</i>                                                                                                                                                     |                                        | 1     |                                                      |                                     |               |                                     |               |
|                                        | (iii)                                                | Dapat menyatakan inferens berdasarkan pemerhatian dengan betul<br><i>Able to state the inference based on the observation correctly.</i><br><br>Contoh jawapan:<br>1. Arus elektrik mengalir/ Beza keupayaan terhasil<br><br><i>Sample answer</i><br>1. <i>Current produced</i>                                                                                            |                                        | 1     |                                                      |                                     |               |                                     |               |



| Question Number |  | Rubric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sub marks | Marks |
|-----------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| (c)             |  | Dapat menyatakan hipotesis dengan betul.<br><i>Able to state the hypothesis correctly.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2         | 2     |
|                 |  | <p>Contoh jawapan;</p> <ol style="list-style-type: none"> <li>Pasangan logam kuprum dan Y menghasilkan beza keupayaan paling tinggi manakala pasangan logam kuprum dan Z menghasilkan beza keupayaan paling rendah</li> <li>Semakin besar perbezaan keupayaan elektrod piawai pasangan logam, semakin besar beza keupayaan/ nilai voltan terhasil</li> </ol> <p>Sample answer</p> <ol style="list-style-type: none"> <li>Copper and Y metal pairs produce the highest potential difference while copper and Z metal pairs produce the lowest potential difference</li> <li>The greater the potential difference between the standard electrodes of the metal pair, the greater the potential difference/ voltage value produced.</li> </ol> |           |       |
| (d)             |  | <p>Dapat menyusun logam mengikut agen penurunan paling kuat kepada agen penurunan paling lemah dengan betul<br/><i>Able to arrange metals according to the strongest reducing agent to the weakest reducing agent correctly</i></p> <p>Jawapan/ Answer</p> <ol style="list-style-type: none"> <li>Y, X, Z, Cu</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                    |           | 1     |
| (e)             |  | <p>Dapat menyatakan definisi secara operasi mengikut kriteria berikut dengan betul;</p> <ol style="list-style-type: none"> <li>Pemerhatian</li> <li>Apa yang perlu di buat</li> </ol> <p><i>Able to define operationally based on following criteria correctly ;</i></p> <ol style="list-style-type: none"> <li>Observation</li> <li>What to do</li> </ol> <p>Contoh jawapan:</p> <ol style="list-style-type: none"> <li>Bacaan voltmeter terhasil apabila 2 pasangan logam berlainan dicelupkan ke dalam larutan CuSO<sub>4</sub></li> </ol> <p>Sample answer:</p> <ol style="list-style-type: none"> <li>Voltmeter reading produced when 2 different metals placed into CuSO<sub>4</sub> solution.</li> </ol>                             | 1<br>1    | 2     |
| Jumlah / total  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 15        | 15    |

END OF MARKING SCHEME