



JABATAN PELAJARAN TERENGGANU

MARK SHEET PAPER 1 MPP3

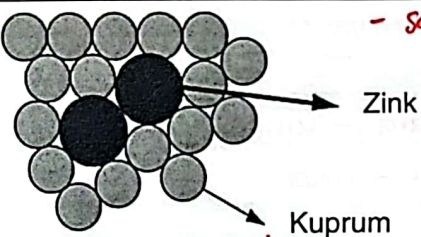
CHEMISTRY SPM 2022

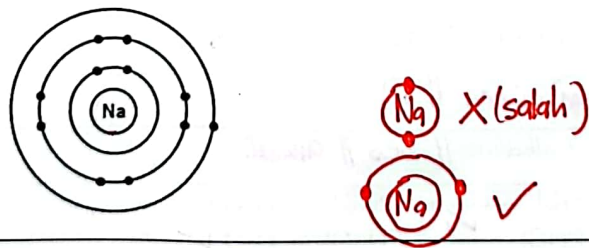
| | |
|----|-----------------|
| 1 | D |
| 2 | C |
| 3 | B |
| 4 | A |
| 5 | C |
| 6 | B |
| 7 | B |
| 8 | A |
| 9 | B |
| 10 | D -A |
| 11 | C |
| 12 | A |
| 13 | D |
| 14 | D |
| 15 | C |
| 16 | A |
| 17 | C |
| 18 | A |
| 19 | A |
| 20 | A |

| | |
|----|------|
| 21 | D |
| 22 | D |
| 23 | C |
| 24 | C |
| 25 | D |
| 26 | D |
| 27 | B |
| 28 | D |
| 29 | B |
| 30 | D |
| 31 | A |
| 32 | D |
| 33 | A |
| 34 | C |
| 35 | C |
| 36 | A |
| 37 | A |
| 38 | C |
| 39 | B |
| 40 | B//A |

MPP3 – Peperiksaan Percubaan SPM 2022
 TINGKATAN 5
 4541/2 CHEMISTRY / KIMIA
 Paper / Kertas 2

Bahagian A / Section A

| Question Number | Rubric | Sub marks | Marks |
|-----------------|--|-----------|----------|
| 1 (a) | Loyang Brass | | 1 |
| (b) |  <p>[Susunan atom] saiz berbeza [label atom] wajib ada</p> | 1 1 | 2 |
| (c) (i) | Alooi P lebih keras berbanding kuprum - tak terima simbol Alloy P is harder than copper kena ada > | | 1 |
| (ii) | Gangsa // kupronikel Bronze | | 1 |
| TOTAL | | | 5 |

| | | | |
|--------------|--|--------|----------|
| 2 (a) | Isotop / isotope * ejaan kena betul | 1 | 1 |
| (b) | Proton | 1 | 1 |
| (c) | Q dan R Atom Q dan R mempunyai bilangan elektron valens yang sama Atom Q and R have same number of valence electron wajib ada | 1 1 | 2 |
| (d) |  | 1 | 1 |
| TOTAL | | | 5 |

| | | | | |
|---|-----|--|--------|----------|
| 3 | (a) | Molekul berantai panjang yang terbina daripada banyak unit ulangan kecil yang disebut monomer <i>Polymer is a long chain molecules made up of a large number of small repeating identical units of monomer.</i> | | 1 |
| | (b) | P= Termoplastik // Thermoplastic Q= Termoset // Thermoset | 1 1 | 2 |
| | (c) | P | | 1 |
| | (d) | - Tidak - Kerana menghasilkan gas beracun/ toksik / gas beracid <i>No</i> <i>Because produced poisonous / toxicity gas</i> <i>X pencemaran udara - umum</i> | 1 1 | 2 |
| | | <i>X gas berbahaya - umum</i> | | |
| | | TOTAL | | 6 |

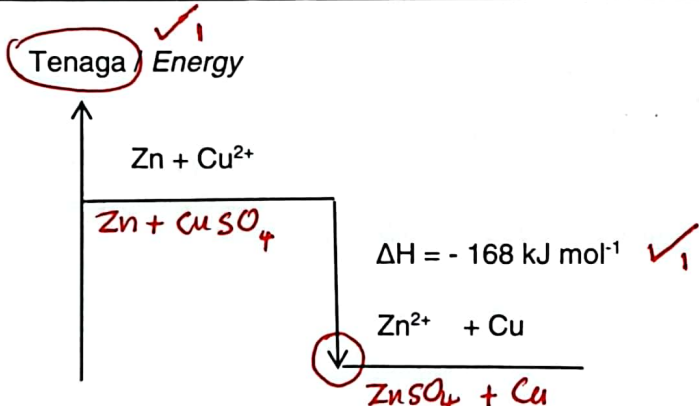
| | | | | | |
|----|-----|-------|--|--------|----------|
| 4. | (a) | (i) | Sebatian ion // ion <i>Ionic compound</i> | | 1 |
| | | (ii) | Mg^{2+} , OH^- // ion magnesium, ion hidroksida | | 1 |
| | | (iii) | Daya Elektrostatik // Daya tarikan elektrostatik <i>Electrostatic force</i> | | 1 |
| | (b) | (i) | $Mg(OH)_2 + 2HCl \rightarrow MgCl_2 + 2H_2O$ ✓ Formula kimia yang betul / <i>Correct chemical formula</i> Persamaan yang seimbang / <i>Balanced equation</i> | 1 1 | 2 |
| | | (ii) | 2 mol HCl : 1 mol $MgCl_2$ 0.5 mol HCl : 0.25 mol $MgCl_2$ ✓ Jisim / <i>Mass</i> : $0.25 \times (24 + 35.5(2))$: 23.75g ✓ | 1 1 | 2 |
| | | | TOTAL | | 7 |

| | | | | | |
|---|-----|---|--|--------|----------|
| 5 | (a) | Unsur peralihan // <i>Transition elements</i> | | 1 | |
| | (b) | U // Aluminium // Al | | 1 | |
| | (c) | (i) | Beralkali // <i>alkaline</i> // bes // alkali | 1 | |
| | | (ii) | $R_2O + 2HCl \rightarrow 2RCl + H_2O$ // $Na_2O + 2HCl \rightarrow 2NaCl + H_2O$ ✓ Formula bahan dan hasil Persamaan seimbang | 1 1 | 2 |
| | (d) | (i) | R,T,U,V | 1 | |
| | | | <i>X no proton tak terlibat dlm tsis</i> - Bilangan proton bertambah semasa merentasi kala. - Daya tarikan antara dan nukleus dan elektron valens semakin kuat. <i>terhadap elektron</i> <i>Number of proton increase when across the period.</i> <i>The force of attraction between nucleus and valence electron increase.</i> | 1 1 | 2 |
| | | | TOTAL | | 8 |

| | | | | | |
|--------------|-----|-------|--|-------------|--|
| 6 | (a) | | Hidroksil // -OH <i>Hydroxyl</i> | | 1 |
| | (b) | (i) | Pendehidratan <i>Dehydration</i> | 1 | 1 |
| | | (ii) | <p>(Porcelain chips) <i>boleh abaikan</i></p> $\text{C}_6\text{H}_{13}\text{OH} \longrightarrow \text{C}_6\text{H}_{12} + \text{H}_2\text{O} \quad \checkmark \text{ 2m}$ <p>[Correct formula of reactants and product] [With correct catalyst] <i>-abaikan</i></p> | 1 1 | 2 |
| | | (iii) | <p>1 mol $\text{C}_6\text{H}_{13}\text{OH}$: 1 mol C_6H_{12} 2 mol $\text{C}_6\text{H}_{13}\text{OH}$: 2 mol C_6H_{12} \checkmark Jisim $\text{C}_6\text{H}_{12} = 2 \times [6(12) + 12(1)\text{g}] // 168\text{g}$ \checkmark</p> | 1 1 | 2 |
| | (c) | | <p><i>Pemerhatian</i></p> <ul style="list-style-type: none"> Sebatian X tidak menukarkan warna perang air bromin manakala heks-1-ena menukarkan warna perang air bromin kepada tidak berwarna. Sebatian X adalah hidrokarbon tepu / mengandungi ikatan tunggal manakala heks-1-ena adalah hidrokarbon tidak tepu / mengandungi ikatan ganda dua diantara atom karbon Sebatian X tidak bertindak balas dengan air bromin manakala heks-1-ena bertindak balas dengan air bromin. <i>Compound X does not change the brown colour of bromine water while hexene change the brown colour of bromine to colourless.</i> <i>Compound X is saturated hydrocarbon / consists of single bond while hex-1-ene is unsaturated hydrocarbon / consists of double bond between carbon atoms</i> <i>Compound X does not react with bromine water while hex-1-ene react with bromine water</i> <p><i>- kena pairing</i></p> | 1 1 1 | <i>X menyahwarna bromin - tak sebut</i> 3 |
| TOTAL | | | | | 9 |

- haba yg dibebaskan

Pemerhatian:
suhu meningkat

| | | | | |
|----|-----|---|------------|----|
| 7. | (a) | Haba penyesaran ialah perubahan haba apabila satu mol logam disesarkan daripada larutan garamnya. CuSO ₄ oleh logam yang lebih elektropositif // Zn Heat of displacement is the heat change when one mole of a metal is displaced from its salt solution // CuSO ₄ by a more electropositive metal // Zn | | 1 |
| | (b) | Larutan biru tidak berubah // Zink melarut // bacaan termometer meningkat // cawan polisterina menjadi panas // Blue solution does not change // Zinc dissolves // thermometer reading increases // polystyrene cup becomes hot - Larutan biru tidak berwarna // pudar // dinyahwarnakan | | 1 |
| | (c) | (i) Q = 100 x 4.2 x 20 // 8400 J // 8.4 kJ | | 1 |
| | | (ii) Bilangan mol = $\frac{0.5 \times 100}{1000}$ // Number of mole = 0.05 mol $\Delta H = \frac{-8400}{0.05}$ // -168 000 J mol ⁻¹ // -168 kJ mol ⁻¹ (tanda '-' dan unit yang betul) | 1 1 | 2 |
| | | (iii)  | | |
| | | 1. Label tenaga dan anak panah kebawah dan dua aras tenaga untuk tindak balas eksotermik 2. Persamaan ion / persamaan kimia dan ΔH yang betul 1. Energy labelled with arrow downward and two energy levels for exothermic reaction 2. Ionic equation/ chemical equation and ΔH correctly | 1 1 | 2 |
| | (d) | (i) Tiada perubahan No reaction changes | | 1 |
| | | (ii) - Tindakbalas tidak berlaku - Argentum kurang elektropositif dari kuprum // argentum tidak dapat menyesarkan kuprum daripada larutan kuprum(II)sulfat // Nilai E° Ag lebih positif dr nilai E° Cu Reaction not occur Silver less electropositive than copper // silver cannot displace copper from copper(II) sulphate solution | 1 1 | 2 |
| | | kereaktifan - guna bila berbls dgn oksigen | TOTAL | 10 |

| | | | | | |
|---|-----|-------|--|--------------|-----------|
| 8 | (a) | (i) | Kosmetik ialah <u>bahan</u> atau <u>produk</u> yang digunakan secara <u>luaran</u> untuk membersihkan, melindungi atau mencantikkan penampilan seseorang. <i>Cosmetics are materials or products that are used externally to cleanse , protect or enhance one's appearances</i> | 1 | 1 |
| | | (ii) | Betamethasone valerate <i>Betamethasone valerate</i> | 1 | 1 |
| | | (iii) | <ul style="list-style-type: none"> - Mudah dihasilkan menggunakan bahan-bahan semula jadi// - Selamat dan tiada bahan kimia berbahaya// - Kos yang murah.// <i>Easy to produce using natural ingredients// Safe and free from harmful chemicals// Low cost</i> [Any two] | 1 1 | 2 |
| | (b) | (i) | Asam Jawa // <i>Tamarind // Madu /Lemon/</i> Melegakan batuk // <i>relief coughs</i> | 1 1 | 2 |
| | | (ii) | Ubat tradisional tidak menjalani ujian klinikal // Sukar untuk menentukan dos penggunaan yang tepat // <i>Lambat atau sembuh</i> <i>Traditional medicine may not undergo clinical trials// Hard to determine the correct dosage / amount</i> | | 1 |
| | | (iii) | <ul style="list-style-type: none"> ✓ Kodeina melegakan kesakitan dengan lebih cepat jika diambil mengikut preskripsi doktor // <i>Codeine relieves pain faster if taken according to doctor's prescription</i> • Kodeina menyebabkan rasa mengantuk // <i>Codeine causes drowsiness</i> ✓ Jus asam jawa melegakan kesakitan tanpa sebarang kesan sampingan // <i>Tamarind juice relieves pain without any side effect</i> • <i>Jus asam jawa boleh mudah didapati / mudah disediakan</i> • <i>Kodeina telah menjalani ujian klinikal.</i> | 1 1 1 | 3 |
| | | | | TOTAL | 10 |

• Kodeina ubat terkawal

• Jus asam jawa tiada bahan kimia.

Bahagian B / Section B

| | | | | | |
|---|--|--|---|---|-----------|
| 9 | (a) | (i) | Tindak balas pengoksidaan dan penurunan berlaku <u>secara serentak</u> / pada masa yang sama <i>Oxidation and reduction reaction happen simultaneously/ at the same time</i> | 1 | 1 |
| | | (ii) | 1. Pemerhatian/observation : - kepingan zink menipis/ mengecil/melarut <i>zinc electrode become thinner/ smaller/ dissolve</i> | 1 | 6 |
| | | | 2. Atom zink melepaskan elektron membentuk ion zink// zink dioksidakan <i>Zinc atom release electron become zinc ion// zinc is oxidized</i> | 1 | |
| | | | 3. Pengoksidaan/oxidation : $Zn \rightarrow Zn^{2+} + 2e$ (2m) | 1 | |
| | | | 4. Penurunan/reduction : $Ag^+ + e \rightarrow Ag$ Notasi sel / cell notation: 5. Kedudukan terminal yang betul <i>Correct position of terminal</i> | 1 | |
| 6. Sempadan fasa dan titian garam yang betul <i>Correct phase border and salt bridge</i> $Zn Zn^{2+} Ag^+ Ag$ (2m) | 1 | | | | |
| (iii) | 1. Nilai E^0 sel bertambah/ value of E^0 cell increase | 1 | 3 | | |
| | 2. Perbezaan nilai E^0 antara Mg dan Ag lebih tinggi daripada nilai E^0 antara Zn dan Ag <i>The differences of Value of E^0 between Mg and Ag is higher than value of E^0 between Zn and Ag</i> | 1 | | | |
| | 3. E^0 sel/ cell = $+0.80 - (-2.38) = +3.18V$ <i>wajib ada tanda '+'</i> | 1 | | | |
| (b) | (i) | 1. Ungu kepada tidak berwarna /Purple to colourless | 1 | 7 | |
| | | 2. Agen pengoksidaan: <u>ion manganat(VII)</u> / MnO_4^- // kalium manganat (VII) berasid <i>Oxidizing agent: manganate(VII) ion/ MnO_4^- // acidified potassium manganate (VII)</i> | 1 | | |
| | | 3. Agen penurunan: <u>ion iodida</u> / I^- // kalium iodida <i>Reducing agent: ion iodida/ I^- // Potassium iodide</i> | 1 | | |
| | | 4. Formula betul/ Correct Formulae | 1 | | |
| | | 5. Persamaan seimbang / Balance equation $MnO_4^- + 8H^+ + 5e \rightarrow Mn^{2+} + 4H_2O$ | 1 | | |
| | | 6. Pengiraan nombor pengoksidaan <i>Calculation of oxidation number</i> $x + 4(-2) = -1$ $x = +7$ | 1 | | |
| (ii) | 1. Gambarajah berfungsi/ Functional diagram | 1 | 3 | | |
| | 2. Label dengan betul/ Correct label | 1 | | | |
| | 3. Anak panah arah elektron mengalir <i>Arrow electron flow</i> | 1 | | | |
| | | | | | |
| TOTAL | | | | | 20 |

| | | | | | |
|----|-----|--|--|-----|----|
| 10 | (a) | <p>- Situasi A // <i>Situation A</i> // <i>Jejari kentang</i></p> <p>- Saiz // <i>Size</i></p> <p>- Jejari kentang mempunyai jumlah luas permukaan yang lebih besar // <i>The fries has larger total surface area</i></p> <p>- Lebih banyak haba dapat diserap // <i>More heat energy is absorbed.</i></p> | 1 | | |
| | | | 1 | | |
| | | | 1 | | |
| | | | 1 | | 4 |
| | (b) | (i) | X – Kuprum (II) sulfat // <i>Copper(II) sulphate</i> | 1 | |
| | | | $Zn + 2HNO_3 \rightarrow Zn(NO_3)_2 + H_2$ | 1+1 | |
| | | | Bilangan mol $HNO_3 = 0.2 \times 25 / 1000$ // 0.005 mol <i>Number of mol HNO_3</i> | 1 | |
| | | | 2 mol HNO_3 : 1 mol H_2 // 0.005 mol HNO_3 menghasilkan 0.0025 mol H_2 | 1 | |
| | | | Isipadu $H_2 = 0.0025 \times 24dm^3$ // 0.06 dm^3 // 60 cm^3 | 1 | 6 |
| | | (ii) | <u>Set I dan Set II</u> | | |
| | | | Kadar tindakbalas set II lebih tinggi berbanding set I. | 1 | |
| | | | Set II menggunakan suhu yang lebih tinggi daripada set I | 1 | |
| | | | Tenaga kinetik zarah dalam set II lebih tinggi. | 1 | |
| | | | Frekuensi perlanggaran antara <u>atom Zn</u> dan <u>Ion H^+</u> dalam set II lebih tinggi daripada set I. | 1 | |
| | | | Frekuensi perlanggaran berkesan antara zarah dalam set II lebih tinggi daripada set I. | 1 | |
| | | | <u>Set I dan Set III</u> | | |
| | | | Kadar tindak balas set III lebih tinggi berbanding set I | 1 | |
| | | | Set III menggunakan mangkin / kuprum(II) sulfat. | 1 | |
| | | | Mangkin merendahkan tenaga pengaktifan | 1 | |
| | | | Lebih banyak zarah yang berlanggar mencapai tenaga pengaktifan | 1 | |
| | | | Frekuensi perlanggaran berkesan antara atom Zn dan ion H^+ dalam set III lebih tinggi daripada set I. | 1 | 10 |
| | | | <u>Set I and Set II</u> | | |
| | | | <i>Rate of reaction of set II is higher than set I.</i> | | |
| | | | <i>Set II use the higher temperature than set I</i> | | |
| | | | <i>The kinetic energy of particles in set II is higher</i> | | |
| | | | <i>Frequency of collision between Zn atom and H^+ in set II is higher then set I.</i> | | |
| | | | <i>Frequency of effective collision between particles in set II is higher then set I.</i> | | |

| | | | | | |
|--|--|--|---|--|-----------|
| | | | <p><u>Set I and Set III</u> <i>Rate of reaction of set III is higher than set I.</i> <i>Set III use catalyst / copper(II) sulphate.</i> <i>The catalyst lower the activation energy</i> <i>More particles collide to achieve the activation energy.</i> <i>Frequency of effective collision between Zn atom and H⁺ in set III is higher then set I.</i></p> | | |
| | | | TOTAL | | 20 |

Bahagian C / Section C

| | | | | | | |
|----|------|-----|---|---|-------------|---|
| 11 | (a) | (i) | P - Plumbum(II) nitrat // $Pb(NO_3)_2$ <i>Plumbum (II) nitrate</i> | 1 | 5 | |
| | | | Q - Plumbum(II) oksida // PbO <i>Plumbum(II) oxide</i> | 1 | | |
| | | | R - Nitrogen dioksida // NO_2 <i>Nitrogen dioxide</i> | 1 | | |
| | | | S - Oksigen // O_2 <i>Oxygen</i> | 1 | | |
| | | | T - Plumbum(II) iodida // PbI_2 <i>Lead (II) iodide</i> | 1 | | |
| | | | (ii) | $Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$ [Correct formula of reactants and products] [Balanced equation] | 1 1 | 2 |
| | | | (iii) | Mol KI : Mol Mendakan T 2 : 1 // 0.1 : 0.05 Jisim mendakan T : 0.05×461 // 23.05 g | 1 1 | 2 |
| | | (b) | (i) | Kalium nitrat // <i>potassium nitrate</i> Larut // <i>soluble</i> | 1 1 | 2 |
| | | | (ii) | Turas campuran larutan. Bilas Keringkan. <i>Filter the mixture</i> <i>Rinse</i> <i>Dry</i> | 1 1 1 | 3 |
| | | (c) | (i) | Bahan kimia yang mengion dalam air dan menghasilkan ion hidrogen/ H^+ <i>Chemical substance which ionizes in water to produce hydrogen ion/ H^+</i> | | 1 |
| | (ii) | | - Akuarium X - Air dalam akuarium X berasid//pH air rendah - Tambah kalsium oksida/ CaO // kalsium hidroksida / $Ca(OH)_2$ // kapur soda / <i>soda bikarbonat</i> - Bersifat alkali - Boleh meneutralkan asid//Membantu mengurangkan keasidan air // meningkatkan nilai pH air. | 1 1 1 1 1 | 5 | |

X serbuk penaik → ada campuran asid

X larutan ammonia

X NaOH - terlalu kuat. 8

| | | | | | |
|--|--|--|---|--------------|-----------|
| | | | <i>Aquarium X The water in X's aquarium is acidic// pH of water low Add calcium oxide/ CaO // Calcium hydroxide / Ca(OH)₂ // soda lime Alkaline properties Can neutralize acid//Help to reduce the acidity of water // increase the pH value of water.</i> | | |
| | | | | TOTAL | 20 |

END OF MARKING SCHEME / SKEMA PEMARKAHAN TAMAT