SKEMA PEMARKAHAN PEPERIKSAAN PERCUBAAN SPM 2018 NEGERI PERLIS

4541/2 CHEMISTRY

***Paper* 2**

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 1 | (a)(i) | M:Ionic bond N:covalent bond | 1+1 | 2 |
| (ii) | Molecule | 1 | 1 |
| (b)(i) | M: copper(II) sulphate//Copper(II) nitrate//copper(II) chlorideN: naphthalene | 1+ 1 | 2 |
|  |  | 1 |  |
| (c)(i) | Compound that can conduct electricity in the aqueous solution state+ -Q[Number of electron each shells are correct] [Number of charge and symbol are correct] | 11 | 2 |
|  | Compound that cannot conduct electricity in any stateR1. labelled nucleus with correct number of electron shells
2. sharing a pair of electrons and correct number of electrons
 | 11 | 2 |
|  | **TOTAL** |  | **10** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 2 | (a) | 2.7 | 1 | 1 |
| (b) | Halogen | 1 | 1 |
| (c)(i) | The electronegativity of element J is higher than M | 1 | 1 |
| (ii) | The atomic size of element M is bigger than J //The distance between nucleus toward the outermost shell of element M is higher than element J | 1 | 3 |
| The force of attraction of the nucleus on the valence electron ofthe element J is stronger than element M | 1 |
| The tendency of element J to receive an electron is higher thanelement M | 1 |
| (d) | T//Neon | 1 | 1 |
| (e) | Form coloured ions or compound// | 1 | 1 |
| Form ions with different oxidation number// |
| Form complex ions or compound |
| (f) |  | 1 | 1 |
| **TOTAL** |  | **9** |

|  |  |  |
| --- | --- | --- |
| **Question****Number** | **Answer** | **Mark** |
| 3 | (a) | sublimation | 1 | 1 |
| (b)(i) | decreases | 1 | 1 |
| (ii) | increases | 1 | 1 |
| (c) |  | 1 | 1 |
| (d) (i) | difussion | 1 | 1 |
| (ii) | ion | 1 | 1 |
| (iii) | * Copper(II) sulphate is made up of tiny particles
* The spaces between particles in gel are smaller than in water
* Copper (II) sulphate particles diffuse slower in gel particles
* Copper(II) sulphate diffuse fromhigher concentration region to lower concentration region
 | 1111 | 4 |
|  | **TOTAL** |  | **10** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 4 | (a)(i) | Hidrogen | 1 | 1 |
|  | (ii) | Mg + 2HCl | MgCl2 + H2* Formula bahan tbls dan hasil tbls betul
* Persamaan seimbang
 |  |  |
|  |  | 1 | 2 |
|  |  | 1 |  |
|  | (iii) | Bil mol H2 = 1.2 dm3/24 dm3 = 0.05 molfrom the equation 1 mol Mg : 1 mol H2if 0.05 mol Mg : 0.05 mol H2Mass for Mg = 0.05 x 24 = 1.2g | 1 |  |
|  |  | 1 |  |
|  |  | 1 | 3 |
|  | (b) | * Kadar tindak balas eksperimen I lebih tinggi
* Kecerunan graf Eksperimen I lebih tinggi// graf

eksperimen I lebih tegak // masa utk eksperimen I lebih singkat | 1 |  |
|  |  | 1 | 2 |
|  | (c) | * Kehadiran mangkin//
* Suhu asid//
* Kepekatan asid//
* Saiz magnesium
 |  |  |
|  |  | 1 + 1 | 2 |
|  |  | **TOTAL** |  | **10** |

|  |  |  |
| --- | --- | --- |
| **Question****Number** | **Answer** | **Mark** |
| 5 | (a) | A: SoapB: Detergent | 11 | 2 |
| (b) | X: Dissolves in greaseY: Dissolve in water | 11 | 2 |
| (c) | Hard watercontains calciumion or magnesiumionCleaning agent A forms scum//Cleaning agent B does not form scum. | 11 | 2 |
| (d)(i) | P: Analgesic Q: AntibioticR: Psychoterapeuthic | 111 | 3 |
| (ii) | The unkilled bacteria may become immune to the given medicine. | 1 | 1 |
| (iii) | The patient will be get rid of anxiety//calmer. | 1 | 1 |
|  | **TOTAL** |  | **11** |





|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 6 | (a) (i) | polymer | 1 | 1 |
|  | (ii) | ethene | 1+1 | 2 |
|  | (iii) | releases toxic/acidic/poisionous gas | 1 | 2 |
|  | (b)(i) | Bronze | 1 | 1 |
|  | (ii) | copper and tin/stanum | 1 | 1 |
|  | (iii) | * two different sizes of atoms
* stanum/tin atoms disturb orderly arranged copper atoms/pure metal atoms
* layers of copper atoms/pure metal atoms harder to slide
 | 1 |  |
|  |  | 1 |  |
|  |  | 1 | 3 |
|  | (iv) |  | Cu/copper Sn/stanum | label arrangement |  |  |
|  |  | 1 |  |
|  |  | 1 | 2 |
|  |  | **TOTAL** |  | **11** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 7 | (a)(i) | Anode: OH-Cathode: H+ | 11 | 2 |
|  | (ii) | Anode : 4OH- O2 + H2O + 4eCathode : 2H+ + 2e H2 | 11 | 2 |
|  | (iii) | Insert a lighted wooden splinter at themouth of the test tube, | 1 |  |
|  |  | A pop sound is produced | 1 | 2 |
|  | (b) | **In Set I :** | 1111 |  |
|  |  | Iron spoon is placed at cathode |  |
|  |  | Ag+ is discharged and formed silver atom because the position |  |
|  |  | Ag+ is lower than H+ in **ECS**// Ag+ + e Ag |  |
|  |  | **In Set II :** |  |
|  |  | Iron spoon is placed at anode |  |
|  |  | No silver atom formed  |  |
|  |  |  | 4 |
|  | (c)(i) | **In Cell I**OH- is discharged at anode and formed oxygen gas // 4OH- O2 + H2O + 4ebecause the position of OH- is lower than NO3- in **ECS**The concentration of Cu2+ decreases//Cu2+ is discharged to form copper atom at cathode// Cu2+ + 2e Cu**In Cell II**copper atom (anode) ionises to form Cu2+ // Cu Cu2+ + 2e because the factor is type of electrodesThe concentration of Cu2+ unchanged//concentration for Cu2+ formed at anode // Cu Cu2+ + 2e |  |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 | Max= 5 |
|  | (ii) | **In Cell III** | 111111 |  |
|  |  | Magnesium is more electropositive than copper |  |
|  |  | Magnesium atom ionises to form Mg2+ // Mg Mg2+ + 2e |  |
|  |  | The concentration of Cu2+ decreases// |  |
|  |  | Cu2+ discharge to form copper atom at cathode// |  |
|  |  | Cu2+ + 2e Cu |  |
|  |  | **In Cell IV** |  |
|  |  | Copper is more electropositive than silver |  |
|  |  | Copper atom ionises to form Cu2+ // Cu Cu2+ + 2e |  |
|  |  | The concentration of Cu2+ increases// |  |
|  |  | Copper ionises to form Cu2+ at cathode // Cu Cu2+ + 2e | Max= 5 |
|  |  | **TOTAL** |  | **20** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 8 | (a)(i) | X: Iodine | 1 |  |
|  |  | Y: Bromine | 1 |  |
|  |  | Z: Chlorine | 1 |  |
|  |  | Z, Y, X | 1 | 4 |
|  | (ii) | 1. KX undergoes oxidation because the oxidation number of X increases from –1 to 0.
2. Y2 undergoes reduction because the oxidation number of Y decreases from 0 to –1.
3. Oxidation and reduction occur simultaneous.
4. Correct formulae of reactants and products.
5. Balanced equation

2KX + Y2 → 2KY + X2 //2KI + Cl2 → 2KCl + I2 |  |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  |  | 5 |
|  | (b)(i) | Set I: |  |  |
|  |  | 1. Iron rusts. | 1 |  |
|  |  | 2. Iron is more electropositive than P. | 1 |  |
|  |  | 3. Fe2+ ion formed. | 1 |  |
|  |  | 4. Fe → Fe2+ + 2e | 1 |  |
|  |  | Set II: |  |  |
|  |  | 5. Iron does not rust. | 1 |  |
|  |  | 6. Iron is less electropositive than Q. | 1 |  |
|  |  | 7. Presence of OH–// OH– left. | 1 |  |
|  |  | 8. O2 + 2H2O + 4e → 4 OH– // 2H+ + 2e → H2 | 1 | 8 |
|  | (ii) | Set I: Iron is oxidised. | 1 |  |
|  |  | Set II: Metal Q is oxidised. | 1 |  |
|  |  | Q, Iron, P | 1 | 3 |
|  |  | **TOTAL** |  | **20** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 9 | (a)(i) | Hydrochloric acid //nitric acid // ethanoic acid | 1 |  |
|  |  | magnesium chloride// magnesium nitrate // magnesium ethanoate | 1 | 2 |
|  | (ii) | Mg + 2HCl → MgCl2 + H2 //Mg + 2HNO3 → Mg(NO3)2 + H2 //Mg + 2CH3COOH → Mg(CH3COO)2 + H2- Correct formula of reactants and products- Balance chemical equation |  |  |
|  |  | 1 |  |
|  |  | 1 | 2 |
|  | (b)(i) | Sample answer: |  |  |
|  |  | Magnesium chloride, MgCl2 |  |  |
|  |  | Solution R : sodium/potassium/ammonium carbonate | 1 |  |
|  |  | Sample answer: |  |  |
|  |  | MgCl2 + Na2CO3 → MgCO3 + 2NaCl | 1 + 1 |  |
|  |  | Procedure : |  |  |
|  |  | 1. [20-100] cm3 of MgCl2 solution [0.5 - 2.0] mol dm-3 is | 1 |  |
|  |  | poured into a beaker |  |  |
|  |  | 2. [20-100] cm3 of Na2CO3 solution [0.5 - 2.0] mol dm-3 is | 1 |  |
|  |  | added into MgCl2 solution |  |  |
|  |  | 3. The mixture is stirred | 1 |  |
|  |  | 4. The mixture is filtered | 1 |  |
|  |  | 5. The residue is rinsed and dried. | 1 | 8 |
|  | (ii) | Sample answer:Sulphuric acid is used to prepare MgSO4 | 11 + 111111 |  |
|  |  | Sample answer : |  |
|  |  | H2SO4 + MgCO3 → MgSO4 + CO2 + H2O |  |
|  |  | Procedure: |  |
|  |  | 1. [50-100] cm3 of sulphuric acid [0.5-2.0] mol dm-3 is poured |  |
|  |  | into a beaker . |  |
|  |  | 2. Magnesium carbonate is added bit by bit into the acid |  |
|  |  | until excess. |  |
|  |  | 3. The mixture is filtered |  |
|  |  | 1. The filtrate is heated in evaporating dish until saturated .
2. The saturated solution is allowed to cool at room
 | 8 |
|  |  | temperature and it will filter. |  |
|  |  | **TOTAL** |  | **20** |

|  |  |  |
| --- | --- | --- |
| **Question Number** | **Answer** | **Mark** |
| 10 | (a)(i) | Solution X: ammonia solution//sodium hydroxide? //any akalisSolution: ethanoic acid//methanoic acid// any weak acids any strong acids?Process Z: vulcanization | 1 |  |
|  |  | 1 |  |
|  |  | 1 | 3 |
|  | (ii) | 1. solution Y contains OH- /hydroxide ions
2. OH- does not neutralize negative charges on protein membrane
3. rubber molecules do not coagulate
4. solution X contains H+ /hydrogen ions
5. H+ neutralizes negative charges on protein membrane
6. rubber particles collide with each other and break the membrane
7. rubber molecule coagulate
 | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 | 7 |
|  | (iii) | 1. sulphur atoms form cross-linkages between rubber | 1 |  |
|  |  | molecules// cross-linkages between rubber molecules// |  |  |
|  |  | sulphur atoms are added to double bond in rubber |  |  |
|  |  | molecules |  |  |
|  |  | 2. reduce the rubber molecules from sliding | 1 | 2 |
|  | (b) | 1. **materials** : natural rubber strip, vulcanized rubber strip
2. **apparatus**: ruler, weight, retort stand clip
3. measure the original length of the natural rubber by using ruler
4. Hang a natural rubber strip to the retort stand by using two clips
5. a weight is then hung on the rubber strip and the length is measured
6. a weight is removed and the length is measured again
7. steps 1 to 6 are repeated using vulcanized rubber
8. the observation is recorded
 | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 |  |
|  |  | 1 | 8 |
|  |  | **TOTAL** |  | **20** |

END OF MARKING SCHEME