PERCUBAAN SPM NEGERI PERLIS 2018

CHEMISTRY 3

MARKING SCHEME

FOR EXAMINER’S USE ONLY

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(a) | **Able to state the relationship between the manipulated variable and the responding variable and stating the direction correctly** Sample answer  Presence of water acid ethanoic will shows the acidic properties)//absence of water ethanoic acid does not show acidic properties.  Note: RV- MV score 2 | 3 |
| **Able to state the relationship between the manipulated variable and the responding variable but less accurate in stating the direction**  Sample answers  Acid ethanoic shows acidic property in water.// Acidic property shown in the presence of water. | 2 |
| **Able to give an idea of hypothesis**  Sample answer  Water changes the pH value.// water shows acidic properties | 1 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(b) | **Able to classify all the variables correctly** | 3 |
|  | Sample Answer |  |
|  | Manipulated variable: |  |
|  | Presence of water// (Type of solvent)/ water and propanon // |  |
|  | Responding variable: |  |
|  | Acidic properties//formation of bubbles//pH value |  |
|  | Fixed variables: |  |
|  | Acid//Type of acid//ethanoic acid |  |
|  | **Able to state any 2 variables correctly** | 2 |
|  | **Able to state any 1 variable correctly or any three ideas** | 1 |
|  | **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(c) | **Able to state three different observations and three corresponding inferences correctly**  \* accept matching correct inference from less accurate observation.(e.g: colourless gas, air bubbles) | 6 |
| **Able to state any 5 observations and corresponding inferences correctly** | 5 |
| **Able to state any 4 observations and corresponding inferences**  **correctly** | 4 |
| **Able to state any 3 observations and corresponding inferences correctly** | 3 |
| **Able to state any 2 observations and corresponding inferences correctly** | 2 |
| **Able to state any 1 observation or corresponding inference correctly or any three idea from observation or any three idea**  **from inferences** | 1 |
| **No response or wrong response** | 0 |

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| Observation | Inference |
| Bubbles formed//efferverscene | Ethanoic acid shows acidic properties//carbon dioxide gas produced |
| No bubbles formed//No efferverscene | Ethanoic acid cannot shows acidic properties// No carbon dioxide gas |
| pH value is 3 | Ethanoic acid shows acidic properties |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(d) | **Able to describe the following criteria:**  (i) What should be done (ii)What should be observed  Sample Answer  Substance that shows pH 3 in the present of water//substance produced bubbles in the present of water when react with seashells | 3 |
| **Able to describe either criteria (i) or (ii)**  Sample Answer  Substance that shows pH 3 //substance in the present of water// substance produced bubbles when react with seashells | 2 |
| **Able to give an idea for an acid.**  Sample Answer Ethanoic acid is an acid | 1 |
| **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(e)(i) | **Able to predict the** pH value when pH meter is dipped into the | 3 |
|  | solution in set IV. |  |
|  | Answer |  |
|  | **7** |  |
|  | **Able to predict the** pH value when pH meter is dipped into the | 2 |
|  | solution in set IV less correctly |  |
|  | Answer |  |
|  | [6-6.9] |  |
|  | **Able to give an idea of prediction** | 1 |
|  | Sample answer |  |
|  | 3 |  |
|  | **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(e)(ii) | **Able to give any three reasons correctly**  Sample Answer   1. Without water/ In propanon, ethanoic acid cannot ionises 2. No H+ ion present 3. Ethanoic acid cannot shows acidic properties//pH value 3 | 3 |
| **Able to give two reasons correctly** | 2 |
| **Able to give any one or an idea of the reason**  Sample answer  Different solvents shows acidic properties | 1 |
| **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 1(f) | **Able to state the relationship between the type of solvents with acidic properties of ethanoic acid.**  Sample answer  In/present of water, ethanoic acid can shows its acidic properties//without water/In propanon, ethanoic acid cannot shows its  acidic properties | 3 |
| **Able to state the relationship between the type of solvents with acidic properties of ethanoic acid less correctly**  Sample answer  Ethanoic acid in water is an acid | 2 |
| **Able to give a relevant idea**  Sample answer  Different solvents shows acidic properties//Type of solvents causes acidic properties | 1 |
| **No response or wrong response** | 0 |

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| Element  *Unsur* | Pb | O |
| Mass(g)  *Jisim*(g) | 49.6743/49.68/(i) | 3.8425/3.8/(ii) |
| Number of mol  *Bilangan mol* | 0.24(iii) | 0.24(iii) |
| Simplest ratio *Nisbah teringkas* | 1(iv) | 1(iv) |
| Empirical Formula *Formula Empirik* | PbO(v) | |

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| **Questions** | **Mark Scheme** | **Mark** |
| 2(a) | **Able to record all the reading to two decimal places**  Answer 64.00  117.52  113.68 | 3 |
| **Able to record any two readings correct to two decimal places** | 2 |
| **Able to record any one reading correct to two decimal places or record all readings** | 1 |
| **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
|  | **Able to calculate determine the empirical formula of lead oxide correctly**  Answer | 3 |
| **Able to calculate and determine *any three of b*(i), (ii),(iii),(iv) and**  **(v) correctly**  Note : ecf no of mol from (i) or (ii) | 2 |
| **Able to calculate *any two of b*(i), (ii) and (iii),(iv) dan (v) correctly**  Note : ecf (iii) from (i) and (ii) | 1 |
| **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 2(c) | **Able to classify all the metal oxides given into suitable methods.**  Answer  **If reverse: score 1** | 3 |
| **Able to classify any three of the metal oxides given into suitable methods.** | 2 |
| **Able to classify any two the metal oxides given into suitable methods** | 1 |
| **No response or wrong response** | 0 |

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| Method 1  *Kaedah* I | Method II  *Kaedah* II |
| Iron oxide Tin oxide  Copper oxide | Aluminium oxide Zinc oxide |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(a) | **Able to state the problem statement correctly**  Sample answer  Does heat of displacement of copper by zinc is higher than heat of displacement of copper by iron? //  What heat of displacement is different when metals used is different ? Does heat of displacement is different when type of metals is different? | 3 |
| **Able to state the problem statement less correctly**  Sample answer  Does/Can metals affect the heat of displacement? //  To compare the heat of displacement of any two metals with copper(II) sulphate solution. | 2 |
| **Able to an idea of problem statement of the experiment.**  Sample answer  Metals affects heat of displacement// How is the heat of displacement? | 1 |
| **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(b) | **Able to state the three variables correctly**  Sample answer  Manipulated variable: Type of metals//[name]  Responding variable:  Heat of displacement//temperature change  Fixed variables:  Type of solution//copper(II) sulphate //volume and concentration of copper(II) sulphate //plastic/ polystyrene cup// mass of metals | 3 |
|  | **Able to state the two variables correctly** | 2 |
|  | **Able to state the any one variables correctly** | 1 |
|  | **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(c) | **Able to state the relationship between manipulated variables and responding variable and state the direction correctly.**  Sample answer  The more electropositive metal/[Zinc] will produce higher heat of displacement than a less electropositive metal/[Iron] when react with copper(II) sulphate solution.  Note: RV → MV score 2 | 3 |
|  | **Able to state the relationship between manipulated variables and responding variable without stating the direction.**  Sample answer  Different types of metals will produce different heat of displacement. | 2 |
|  | **Able to state an idea of hypothesis.**  Sample answer  Metals causes heat of displacement | 1 |
|  | **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(d) | **Able to list all the material and apparatus**. |  |
|  |  | 3 |
|  | Sample answer |  |
|  | Material |  |
|  | Zinc powder, [iron] powder, copper(II) sulphate solution |  |
|  | **Reject**: Silver /Sodium/Calcium/Potassium |  |
|  | Apparatus |  |
|  | Plastic cup/polystyrene cup, thermometer, measuring cylinder, |  |
|  | spatula |  |
|  | **Able to list the following material and apparatus.** | 2 |
|  | Sample answer |  |
|  | Materials |  |
|  | [Zinc] , [iron] , copper(II) sulphate solution |  |
|  | **Reject**: Silver /Sodium/Calcium/Potassium |  |
|  | Apparatus |  |
|  | [Container], thermometer, measuring cylinder |  |
|  | **Able to give any metal and any suitable container.** |  |
|  |  | 1 |
|  | Sample answer |  |
|  | [metal] , any suitable container |  |
|  | **No response or wrong response** | 0 |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(e) | **Able to list all the steps correctly.**  Sample answer   1. [25-100]cm3 [0.5-2.0] mol dm-3 copper(II) sulphate solution is measured and poured into a plastic cup. 2. The initial temperature of the solution is recorded. 3. [1-5]g/[1-3] spatula of zinc powder is weighed and added into the solution. 4. The mixture is stirred with thermometer. 5. The highest/maximum temperature is recorded. 6. Step1to 5 is repeated by using [iron] powder. | 3 |
| **Able to list down steps 1, 2, 3, 5,6 less correctly.** | 2 |
| **Able to list down steps 1 and 3 less correctly.** | 1 |
| **No response or wrong response** | 0 |

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| Type of metals//Metal | Zinc | [Iron] |
| Initial temperature of solution(0C) |  |  |
| Highest temperature of the  mixture(0C) |  |  |

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|  | // Observation |
| Zinc |  |
| [iron] |  |

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| **Questions** | **Mark Scheme** | **Mark** |
| 3(f) | **Able to tabulate the data with the following aspects**   1. Correct titles 2. Complete list of metals Sampel answer | 2 |
| **Able to tabulate the data but incomplete**  Sample answer | 1 |
| **No response or wrong response** | 0 |