<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>1(b)</td><td>Able to give six statements correctly
Sample answer:
<table>
<tr><td>Manipulated variable:
Types of metals at negative terminal// pairs of metal</td><td>By replacing different metals at negative terminal</td></tr>
<tr><td>Responding variable :
The reading of voltmeter</td><td>Read the voltage shows at voltmeter</td></tr>
<tr><td>Fixed variable :
Copper / volume and concentration of sodium nitrate solution</td><td>Place copper at positive terminal / use the same volume and concentration of sodium nitrate solution</td></tr>
</table></td><td>6</td></tr>
<tr><td></td><td>Able to give five statements correctly</td><td>5</td></tr>
<tr><td></td><td>Able to give four statements correctly</td><td>4</td></tr>
<tr><td></td><td>Able to give three statements correctly</td><td>3</td></tr>
<tr><td></td><td>Able to give two statements correctly</td><td>2</td></tr>
<tr><td></td><td>Able to give one statements correctly</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

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<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td>1(c)</td><td>Able to state the relationship between the manipulated variable and the responding variable with direction.

Sample answer:
The highest the position of metal in the electrochemical series, the largest the voltage is produced. //
The further the distance between two metals in the electrochemical series, the bigger the voltage value.</td><td>3</td></tr>
<tr><td></td><td>Able to state the relationship between the manipulated variable and the responding variable.

Sample answer:
The highest the position of metal, the largest the voltage is produced.</td><td>2</td></tr>
<tr><td></td><td>Able to state the relationship between the manipulated variable and the responding variable with direction.

Sample answer:
Different metal , different voltage is produced.</td><td>1</td></tr>
<tr><td></td><td>No response or wrong response</td><td>0</td></tr>
</table>

Question	Rubric	Score
1(d)	Able to arrange all the five metals according to descending order of reactivity correctly. Sample answer: Q, P, R, S , Copper	3
	Able to arrange all the four metals according to descending order of reactivity correctly. Sample answer: Q, P, R, Copper, S / P, R, S , Copper, Q / P, R, Q, S , Copper	2
	Able to arrange all the five metals according to ascending order of reactivity correctly. Sample answer: Copper, S, R, P, Q	1
	No response or wrong response	0

Question	Rubric	Score
1(e)	Able to predict correctly Sample answer: The voltage produced is greater than 2.30 V	3
	Able to predict almost correctly Sample answer: The voltage produced is greater than 2.30	2
	Able to state an idea to arrange the metal Sample answer: The voltage produced is higher	1
	No response or wrong response	0

Question	Rubric	Score
2(a)	Able to state three observations correctly Sample answer: Mixture of S Oxide and carbon powder : Bright flame Mixture of Z Oxide and carbon powder : Faint glow Mixture of C Oxide and carbon powder : moderate bright flame	3
	Able to state two observations correctly	2
	Able to state one observations correctly / idea about observation of the flame	1
	No response or wrong response	0

Question	Rubric	Score
2(b)	Able to state all variables correctly Sample answer : Manipulated variable: Oxide of metal Responding variable : Vigorous/ Intensity of reaction Controlled variable : Mass of carbon and mass of oxides of metal	3
	Able to state any two variables correctly	2
	Able to state any one variables correctly	1
	No response or wrong response	0

Question	Rubric	Score
2(c)	Able to state inference correctly. Sample answer: The further the position of metal oxide from carbon in the reactivity series the brighter is the flame.	3
	Able to state inference not completely Sample answer: The position of metal oxide from carbon in the reactivity series give the brighter of the flame.	2
	Able to state an idea of inference. Sample answer: Different position of metal oxide , different flame.	1
	No response or wrong response	0

Question	Rubric	Score
2(d)	Able to arrange all the five metals according to ascending order of reactivity correctly. Sample answer: S, C, Z, Carbon, M	3
	Able to arrange all the four metals according to ascending order of reactivity correctly. Sample answer: S, C, Carbon, M, Z / C, Carbon, M, Z, S / C, Carbon, S ,M, Z	2
	Able to arrange all the five metals according to descending order of reactivity correctly. Sample answer: M, Carbon, Z, C, S	1
	No response or wrong response	0

Question	Rubric	Score
2(e)	Able to determine whether metal M or metal N higher in the reactivity series accurately. Sample answer: 1. Put 2 g of potassium manganate(VII) crystals into the bottom test tube, insert glass wool into the middle portion. 2. Put 2 g metal M powder near the mouth of the test tube. 3. Heat the metal M and potassium manganate(VII) crystals strongly. 4. Repeat the experiment with metal N powder. 5. Compare the intensity of the glow or flame. 6. The metal with the brighter glow or flame is higher in the reactivity series.	3
	Able to determine by state three steps correctly Sample answer: Steps 3, 4, 5	2
	Able to determine by state two steps correctly Sample answer: Steps 3, 5	1
	No response or wrong response	0

Question	Rubric	Score
3(a)	Able to give the statement of the problem correctly. Sample answer : Do all nitrate salts decompose by heat to produce the same products?	3
	Able to give the statement of the problem correctly. Sample answer : Do all nitrate salts decompose to produce the products?	2
	Able to give the statement of the problem correctly. Sample answer : Heat can affect nitrate salt.	1
	No response or wrong response	0

Question	Rubric	Score
3(b)	Able to state all variables correctly Sample answer: Manipulated variable: Types of nitrate salt Responding variable : Decomposes product. Controlled variable : Mass of nitrate salt	3
	Able to state any two variables correctly	2
	Able to state any one variables correctly	1
	No response or wrong response	0

Question	Rubric	Score
3(c)	Able to state the relationship between the manipulated variable and the responding variable with direction. Sample answer: Most nitrate salts are decomposes by heat to form metal oxide and releases nitrogen dioxide and oxygen gas.// Alkali metal nitrate salt is decomposed by heat to produced nitrite salt and releases oxygen gas.	3
	Able to state the relationship between the manipulated variable and the responding variable. Sample answer: Most nitrate salts are decomposes to form metal oxide and releases nitrogen dioxide and oxygen gas.// Alkali metal nitrate salt is decomposed to produced nitrite salt and releases oxygen gas.	2
	Able to state an idea of hypothesis Sample answer: Nitrate salt decomposes to form same product.	1
	No response or wrong response	0

Question	Rubric	Score
3(d)	Able to give the list of apparatus and materials correctly and completely Answer: **Apparatus :** Test tube, spatula, Bunsen burner, tongs, asbestos sheet. **Materials:** zinc nitrate powder, Lead(II) nitrate powder, potassium nitrate powder, blue litmus paper, wooden splinter.	3
	Able to give the list of apparatus and materials correctly but not completely Answer: **Apparatus :** Test tube, spatula, Bunsen burner **Materials:** zinc nitrate powder, Lead(II) nitrate powder, potassium nitrate powder	2
	Able to give **two** materials and at least **two** apparatus. Answer: **Apparatus :** Test tube, Bunsen burner **Materials:** zinc nitrate powder, potassium nitrate powder,	1
	No response or wrong response	0

Question	Rubric	Score
3(e)	Able to state all procedures correctly Sample answer: 1. Record the colour of zinc nitrate powder before heating. 2. Add in two spatulas of zinc nitrate powder into the test tube. 3. Heat zinc nitrate strongly and test the gas produced with moist blue litmus paper and glowing wooden splinter. 4. Observe the changes colour of the zinc nitrate that occur. 5. Repeats steps (1) to (4) by using Lead(II) nitrate powder and potassium nitrate powder.	3
	Able to state four steps of procedures correctly (2, 3, 4, 5)	2
	Able to state two steps of procedures correctly (2, 3)	1
	No response or wrong response	0

<table>
<tr><th>Question</th><th>Rubric</th><th>Score</th></tr>
<tr><td rowspan="3">3(f)</td><td>Able to exhibit the tabulation of data that includes the following information.
1. Headings
2. List of three nitrate salt

<table><tr><td>Types of nitrate salts</td><td>Decomposes product</td></tr><tr><td>zinc nitrate powder</td><td></td></tr><tr><td>Lead(II) nitrate powder</td><td></td></tr><tr><td>potassium nitrate powder</td><td></td></tr></table></td><td>2</td></tr>
<tr><td>Able to tabulate the data incompletely

<table><tr><td>Types of nitrate salts</td><td>Decomposes product</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td><td>1</td></tr>
<tr><td>No response or wrong response</td><td>0</td></tr>
</table>

END OF MARKING SCHEME