

Question	Rubric	Score								
1(a)	<i>[Able to state the inference based on the observation correctly]</i> Example: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Test tube</th> <th>Inferences</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>The iron nail rust</td> </tr> <tr> <td>B</td> <td>The iron nail does not rusts</td> </tr> <tr> <td>C</td> <td>The iron nail rust quickly</td> </tr> </tbody> </table>	Test tube	Inferences	A	The iron nail rust	B	The iron nail does not rusts	C	The iron nail rust quickly	3
	Test tube	Inferences								
	A	The iron nail rust								
	B	The iron nail does not rusts								
C	The iron nail rust quickly									
<i>[Able to state any <b>two</b> inferences correctly]</i>	2									
<i>[Able to state any <b>one</b> inference correctly]</i>	1									
<i>[No response given or wrong response]</i>	0									

Question	Rubric	Score
1(b)	<i>[Able to state the relationship correctly between the manipulated variable and the responding variable ]</i> Example: Iron coil with magnesium will not rust / Copper speeds up rusting.of iron When a more/less electropositive metal in contact with iron, the metal inhibits/speeds up rusting	3
	<i>[Able to state the relationship incorrectly between the manipulated variable and the responding variable]</i> Example: The rusting of iron is inhibits/speeds up, when a more/less electropositive metal in contact with iron,	2
	<i>[Able to state an idea of hypothesis]</i> Example: The electropositivity of metals affect the rusting of iron	1
	<i>[No response given or wrong response]</i>	0

Question	Rubric	Score
1(c)	<i>[Able to state three variables correctly]</i> Example: Manipulated variable: metals in contact with iron//magnesium,copper Responding variable: Intensity of blue colour	3

	Constant variable: Iron nails//temperature	
	<i>[Able to state any 2 variables correctly ]</i>	2
	<i>[Able to state any 1 variable correctly ]</i>	1
	<i>[No response or wrong response]</i>	0

Question	Rubric	Score
1(d)	<i>[Able to predict obseravation correctly]</i> Example: Higher Intensity of blue colour than test tube C	3
	<i>[Able to state the function of potassium hexacyanoferrate(III) incorrectly]</i> Example: High Intensity of blue colour	2
	<i>[Able to state an idea]</i> Example: Blue colour is formed	1
	<i>[No response given or wrong response]</i>	0

Question Number	Rubric	Score
1(e)	<i>[Able to state the observation correctly ]</i> Example: Intensity of blue colour become higher	3
	<i>[Able to state the operational definition in correctly]</i> Example: Blue colour higher	2
	<i>[Able to state an idea ]</i> Example: Blue colour	1
	<i>[ No response or wrong response]</i>	0

Question	Rubric	Score
1(f)	<b>Able to state the operational definition for the rusting of iron nail correctly.</b>  <u>Sample answer</u> Blue colouration indicates rusting occurs.//	3

	Rusting occurs when iron nail is in contact with copper/tin /less electropositive metal and form blue colouration.	
	<b>Able to state the operational definition for the rusting of iron nail less accurately</b>  <u>Sample answer:</u>  Rusting occurs when iron nail is in contact with copper/tin /less electropositive metal.	2
	<b>Able to state any idea of operational definition.</b>  <u>Sample answer:</u>  Rusting occurs when the colour of solution changes. // Rusting occurs	1
	<b>No response or wrong response</b>	0

Question	Rubric	Score			
1(j)	<i>[Able to classify all the <b>three</b> metals correctly]</i>	3			
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Metals that can provide sacrificial protection</td> <td style="text-align: center;">Metals that cannot provide sacrificial protection</td> </tr> <tr> <td style="text-align: center;">Magnesium</td> <td style="text-align: center;">Copper Silver</td> </tr> </table>		Metals that can provide sacrificial protection	Metals that cannot provide sacrificial protection	Magnesium
	Metals that can provide sacrificial protection	Metals that cannot provide sacrificial protection			
	Magnesium	Copper Silver			
	<i>[Able to classify any <b>two</b> metals correctly]</i>	2			
<i>[Able to classify any <b>one</b> metal correctly]</i>	1				
<i>[No response given or wrong response]</i>	0				

Question number	Rubric	Score
2(a)	<i>Able to record the masses accurately in <b>two decimal places with unit</b></i>  Answer: 18.75 g 20.75 g 20.35 g	3
	<i>Able to record the masses in two decimal places <b>without unit</b></i>	2
	<i>Able to record the masses</i>	1
	<b>No response or wrong response</b>	0

<p><b>2(b)</b></p>	<p><i>Able to construct a table that contains:</i></p> <ol style="list-style-type: none"> <li>1. <i>The mass of combustion tube + porcelain dish + copper oxide and mass with correct unit.</i></li> <li>2. <i>Transfer <u>all</u> the readings from (a) correctly.</i></li> </ol> <p>Answer:</p> <table border="1" data-bbox="432 450 1083 712"> <thead> <tr> <th>Description</th> <th>Mass (g)</th> </tr> </thead> <tbody> <tr> <td>Mass of combustion tube + porcelain dish</td> <td>18.75</td> </tr> <tr> <td>Mass of combustion tube + porcelain dish + copper oxide</td> <td>20.75</td> </tr> <tr> <td>Mass of combustion tube + porcelain dish + copper</td> <td>20.35</td> </tr> </tbody> </table>	Description	Mass (g)	Mass of combustion tube + porcelain dish	18.75	Mass of combustion tube + porcelain dish + copper oxide	20.75	Mass of combustion tube + porcelain dish + copper	20.35	<p>3</p>	
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	<p><i>Able to construct a table that contains:</i></p> <ol style="list-style-type: none"> <li>1. <i>Suitable headings.</i></li> <li>2. <i>Transfer <u>at least two</u> readings from (j)(i) correctly.</i></li> </ol>	<p>1</p>									
	<p>No response or wrong response</p>	<p>0</p>									
<p><b>2(c)</b></p>	<p><i>Able to:</i></p> <ol style="list-style-type: none"> <li>i. <i>calculate the mass of copper</i></li> <li>ii. <i>calculate the mass of oxygen</i></li> <li>iii. <i>show steps to determine empirical formula.</i></li> </ol> <p>Sample answer:</p> <p>Mass of copper : <math>(20.35 - 18.75) \text{ g}</math>  <math>= 1.60 \text{ g}</math></p> <p>Mass of oxygen : <math>(20.75 - 20.35) \text{ g}</math>  <math>= 0.40 \text{ g}</math></p> <table border="1" data-bbox="373 1637 1166 1825"> <thead> <tr> <th>Element</th> <th>Magnesium</th> <th>Oxygen</th> </tr> </thead> <tbody> <tr> <td>Number of mole</td> <td><math>1.60 / 64</math> <math>= 0.025</math></td> <td><math>0.40 / 16</math> <math>= 0.025</math></td> </tr> <tr> <td>Ratio of mole</td> <td><math>0.025 / 0.025</math> <math>= 1</math></td> <td><math>0.025 / 0.025</math> <math>= 1</math></td> </tr> </tbody> </table> <p>Empirical formula = CuO</p>	Element	Magnesium	Oxygen	Number of mole	$1.60 / 64$ $= 0.025$	$0.40 / 16$ $= 0.025$	Ratio of mole	$0.025 / 0.025$ $= 1$	$0.025 / 0.025$ $= 1$	<p>3</p>
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	<p><i>Able to give any <b>two</b> answers above</i></p>	<p>2</p>									

	<i>Able to give any <b>one</b> answer above</i>	1
<b>2(d)</b>	<i>[Able to state all the <b>three</b> observations metals correctly]</i>  a : brown solid turn black b : colourless liquid formed c : copper glow brightly	3
	<i>[Able to classify any <b>two</b> metals correctly]</i>	2
	<i>[Able to classify any <b>one</b> metal correctly]</i>	1
	<i>[No response given or wrong response]</i>	0

<b>3</b>	<b>(a)</b>	<i>Able to give the statement of the problem accurately and response is in question form.</i>  Sample answer: How to determine and identify hexane and ethanoic acid (liquid P and liquid Q)?	3
		<i>Able to give the aim or statement of the problem without question mark.</i>  Sample answer: To differentiate between hexane and ethanoic acid (liquid P and liquid Q) ?// How to determine and identify hexane and ethanoic acid (liquid P and liquid Q).	2
		<i>Able to give an idea of statement of the problem correctly.</i>  Sample answer: How to identify/determine/differentiate alkene and acid ? To identify/determine/differentiate alkene and acid ?	1
		<i>[No response given or wrong response]</i>	0

		<i>Able to state <b>the three</b> variables correctly.</i>	
	(b)	<p><i>Manipulated variable:</i> Hexene and ethanoic acid / Liquid P and Q</p> <p><i>Responding variable:</i> Colour change of reagent / gas bubbles release</p> <p><i>Constant variable:</i> Volume of hexene and ethanoic acid</p>	3
		<i>Able to state <b>any two</b> variables correctly</i>	2
		<i>Able to state <b>any one</b> variables correctly</i>	1
		<i>[No response given or wrong response]</i>	0
	(c)	<p><i>Able to state the relationship between the manipulated variable and the responding variable accurately by stating the <b>colour change in both liquid P and Q.</b></i></p> <p>Sample answer: If liquid P decolourised purple colour of acidified potassium manganate(VII), so liquid P is hexene // Acid will produce gas bubbles with Magnesium (Calcium carbonate)</p> <p>** Bromine water cannot be used because both liquid react with bromine water</p>	3
		<p><i>Able to state the relationship between the manipulated variable and the responding variable accurately by stating the <b>colour change in hexene or hexane only.</b></i></p> <p>Sample answer: Hexene will decolourised colour of acidified potassium manganate(VII) // Acid will produce gas with Magnesium (Calcium carbonate)</p>	2
		<p><i>Able to state the idea of hypothesis correctly.</i></p> <p>Sample answer: Change of colour of acidified potassium manganate(VII) // gas is produce</p>	1
		<i>[No response given or wrong response]</i>	0

		<i>Able to give adequate list of materials and apparatus.</i>	
	<b>(d)</b>	Sample answer: Liquid P, Liquid Q, acidified potassium manganate(VII) solution / Magnesium ribbon, zinc powder or calcium carbonate chips) Test tube, dropper, stopper	3
		<i>Able to give a list of materials and apparatus.</i>	
		Sample answer: Liquid P, Liquid Q, acidified potassium manganate(VII) / Magnesium, zinc or calcium carbonate ) Test tube, stopper.	2
		<i>Able to give an idea of materials and apparatus.</i>	
		Sample answer: Liquid P, Liquid Q, potassium manganate / Magnesium, zinc or calcium carbonate, Beaker / any suitable container	1
		<i>[No response given or wrong response]</i>	0
		<i>Able to state the following five steps:</i>	
	<b>(e)</b>	Sample answer: 1. Some liquid P and liquid Q are poured into two different test tubes. 2. Three drops of acidified potassium manganate(VII) are added into the test tubes. 3. The test tubes are closed with stoppers. 4. The mixtures are shaken. 5. The observations are recorded.	3
		Step 1, 2, 4 and 5	2
		Step 1 and 2	1
		<i>[No response given or wrong response]</i>	0

	<p>(f) <i>Able to exhibit the tabulation of data that includes the following four information :</i></p> <ol style="list-style-type: none"> <li>1. <i>Heading liquid</i></li> <li>2. <i>Two liquid</i></li> <li>3. <i>Heading for observation</i></li> <li>4. <i>2x3 or 3x2 table</i></li> </ol> <p>Sample answer :</p> <table border="1" data-bbox="376 488 1203 602"> <thead> <tr> <th>Liquid</th> <th>Observation</th> </tr> </thead> <tbody> <tr> <td>Liquid P</td> <td></td> </tr> <tr> <td>Liquid Q</td> <td></td> </tr> </tbody> </table>	Liquid	Observation	Liquid P		Liquid Q		3
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