<table>
<tr><th>Qn No.</th><th></th><th>Score</th></tr>
<tr><td rowspan="3">1(a)</td><td>Able to state three readings accurately and with unit
<u>Answer</u>
0,5 A, 0,2 A, 0.7 A</td><td>3</td></tr>
<tr><td>Able to state three readings correctly
<u>Sample answer</u>
0.5, 0.20, 0.7</td><td>2</td></tr>
<tr><td>Able state two readings correctly
<u>Sample answer</u>
0.25, 0.2, 0.7</td><td>1</td></tr>
<tr><td rowspan="3">1(b)</td><td>Able to construct a table that consists of
1. Manipulated variable with unit
2. Responding variable with unit
3. All data transferred correctly
<u>Sample answer</u>:
<table>
<tr><td>Volume of sulphuric acid (cm^3)</td><td>2.0</td><td>2.5</td><td>4.0</td><td>5.0</td><td>6.0</td><td>7.0</td></tr>
<tr><td>Ammeter reading (A)</td><td>0.6</td><td>0.5</td><td>0.2</td><td>0.0</td><td>0.4</td><td>0.7</td></tr>
</table></td><td>3</td></tr>
<tr><td>Able to construct a table that consists of
1. Manipulated variable
2. Responding variable (without unit)
3. 8 data transferred correctly</td><td>2</td></tr>
<tr><td>Able to give an idea of tabulation of data
<u>Sample answer</u>
<table>
<tr><td>Volume</td><td>2.0</td></tr>
<tr><td>Ammeter</td><td>0.6</td></tr>
</table></td><td>1</td></tr>
<tr><td rowspan="3">1(c)</td><td>Able to state one observation correctly
<u>Sample answer</u>:
Ammeter needle / pointer deflects</td><td>3</td></tr>
<tr><td>Able to state one observation
<u>Sample answers</u>:
1. Ammeter reading is 0.6 A
2. White precipitate formed</td><td>2</td></tr>
<tr><td>Able to give an idea of the observation
<u>Sample answers</u>:
1. Ammeter shows reading
2. Precipitate formed</td><td>1</td></tr>
<tr><td rowspan="3">1(d)</td><td>Able to state an inference correctly
<u>Sample answers</u>:
Solution conducts electricity</td><td>3</td></tr>
<tr><td>Able to state an inference
<u>Sample answers</u>:
1. Current flows through
2. Barium sulphate formed</td><td>2</td></tr>
<tr><td>Able to state an idea of inference
<u>Sample answers</u>
1. Solution conducts
2. Solid forms</td><td>1</td></tr>
</table>

1(e)	**Able to state all the variables correctly** Sample answers **Manipulated variable:** Volume of sulphuric acid acid **Responding variable :** Ammeter reading // electrical conductivity **Fixed variable** **:** Sulphuric acid // Barium hydroxide	**3**
	Able to state any two variables correctly or one correct variable and idea of two other variables	**2**
	Able to state any one variable correctly or idea of all the variables	**1**
1(f)	***Able to state the relationship between the manipulated variable and the responding variable with direction*** Sample answer: The more the volume of sulphuric acid added, the ammeter decreases until 0 A and then increases	**3**
	Able to state the relationship between the manipulated variable and the responding variable less correctly Sample answers: 1. The more the volume of sulphuric acid added, the ammeter decreases 2. The more the volume of sulphuric acid added, the ammeter decreases and increases	**2**
	Able to state an idea of hypothesis Sample answer: Volume of sulphuric acid and ammeter reading changes,	**1**
1(g)	**Able to correctly predict the ammeter reading** Answer: [0.5 A – 0.6 A]	**3**
	Able to predict the ammeter reading less correctly Answer: [0.4 A < ammeter reading < 0.5 A] *or* [0.6 A < ammeter reading < 0.7 A]	**2**
	Able to give an idea of predicting the ammeter reading Sample answer: Between 0.4 A and 0. 7 A	**1**
1(h)	**Able to state the operational definition for electrical conductivity with the following criteria:** (i) What should be done Sulphuric acid added to Barium hydroxide solution *or* Switch is closed (ii) What should be observed Ammeter needle deflects Sample answers 1. Ammeter needle deflects when sulphuric acid is added to barium hydroxide solution. 2. Deflection of ammeter needle when switch is closed.	**3**
	Able to state the operational definition for electrical conductivity with the following criteria (i) What should be done ***or*** Sulphuric acid added to Barium hydroxide solution *or* Switch is closed (ii) What should be observed Ammeter needle deflects Sample answers: 1. Deflection of ammeter needle when (solution is added) / (switch is closed) 2. Ammeter deflects when hydrochloric acid is added	**2**
	Able to give an idea for the operational definition for the end point Sample answers: 1. Ammeter shows reading 2. Electron flows through the wires	**1**
1(i)	**Able to explain the electrical conductivity of the solution correctly** Sample answer: 1. Presence of free moving ions.	**3**
	Able to explain the electrical conductivity of the solution less accurately Sample answer: Electrical current is flowing	**2**
	Able to give an idea of electrical conductivity Sample answer: There is current	**1**

<table>
<tr><td></td><td>Able to correctly state the relationship between the ammeter reading and time
Sample answer:
When time increases, the ammeter reading decreases until 0 A and then increases</td><td></td></tr>
<tr><td></td><td>Able to less correctly state the relationship between the ammeter reading and time
Sample answer:
1. When time increases, the ammeter reading decreases.
2. The ammeter reading decreases.</td><td></td></tr>
<tr><td></td><td>Able to give an idea of the relationship between the ammeter reading and time
Sample answer:
Ammeter reading changes</td><td></td></tr>
<tr><td rowspan="3">1(k)</td><td>Able to classify all the salts correctly
Answer
<table><tr><th>Soluble salt</th><th>Insoluble salt</th></tr><tr><td>Magnesium sulphate</td><td>Zinc carbonate</td></tr><tr><td></td><td>Silver chloride</td></tr><tr><td></td><td>Barium sulphate</td></tr></table>Score 1 if reverse classification</td><td>3</td></tr>
<tr><td>Able to classify any three salts correctly</td><td>2</td></tr>
<tr><td>Able to classify any two salts correctly</td><td>1</td></tr>
<tr><td>2(a)</td><td>Able to give the problem statement correctly
Sample answer
1. How is the reactivity of metals towards oxygen?</td><td>3</td></tr>
<tr><td rowspan="2"></td><td>Able to give the problem statement
Sample answer
1. How does magnesium react</td><td>2</td></tr>
<tr><td>Able to to give an idea of problem statement
Sample answers:
1. To determine the reactivity of metals towards oxygen
2. How does a metal react?</td><td>1</td></tr>
<tr><td rowspan="3">2(b)</td><td>Able to state all variables correctly
Sample answers:
Manipulated variable: Magnesium and zinc // Type of metals
Responding variable : Brightness of flame
Fixed variable : Oxygen / (mass of metal powder)</td><td>3</td></tr>
<tr><td>Able to state any two variables correctly or Able to state any one correct variable and idea of two other variables</td><td>2</td></tr>
<tr><td>Able to state any one variable correctly or Able to state idea of all variables</td><td>1</td></tr>
<tr><td rowspan="3">2(c)</td><td>Able to state the hypothesis correctly
Sample answer
1. From Magnesium to zinc, the brightness of flame is lesser.</td><td>3</td></tr>
<tr><td>Able to state the hypothesis
Sample answers:
1. From magnesium to zinc, brightness of flame changes
2. Brightness of flame decreases from magnesium to zinc.</td><td>2</td></tr>
<tr><td>Able to give an idea of the hypothesis
Sample answer:
Metal influences the flame</td><td>1</td></tr>
</table>

<table>
<tr><td rowspan="3">2(d)</td><td>Able to list the materials and apparatus completely
Sample answer:
<u>Materials</u>
1. Magnesium 2. Zinc 3. Potassium manganite (VII)
<u>Apparatus</u>
4. Heating tube 5. Asbestos paper 6. Bunsen burner
7. Retort stand with clamp 8. Glass wool 9. Spatula</td><td>3</td></tr>
<tr><td>Able to list the materials and apparatus less completely
Sample answer
<u>Materials</u>
1. Magnesium 2. Zinc
<u>Apparatus</u>
3. Heating tube 4. Bunsen burner 5. Retort stand 6. Spatula</td><td>2</td></tr>
<tr><td>Able to give an idea of the list of materials and apparatus
Sample answer:
<u>Materials</u>:
1. Magnesium / zinc
<u>Apparatus</u>
2. [Suitable container] 3. Bunsen burner</td><td>1</td></tr>
<tr><td rowspan="3">2(e)</td><td>Able to state all steps in the procedure correctly
Sample answer:
1. Put 2 spatula of $KMnO_4$ into a heating tube.
2. Clamp the heating tube horizontally.
3. Insert some glass wool into the tube.
4. Put 2 spatula of magnesium powder on an asbestos paper.
5. Place the asbestos paper into the heating tube.
6. Heat the magnesium strongly
7. Heat the $KMnO_4$ when magnesium starts to burn.
8. Observe and record.
9. Repeat the experiment by replacing magnesium with zinc</td><td>3</td></tr>
<tr><td>Able to state the steps 1, 4/5, 6, 8 and 9</td><td>2</td></tr>
<tr><td>Able to state an idea of steps 4, 5 and 6</td><td>1</td></tr>
<tr><td rowspan="2">2(f)</td><td>Able to construct a table that consists of:
1. Heading for manipulated variable and
2. Headings for responding variable
Sample answer:
<table><tr><th>Metal</th><th>Observation</th></tr><tr><td>Magnesium</td><td></td></tr><tr><td>Zinc</td><td></td></tr></table></td><td>2</td></tr>
<tr><td>Able to construct a table that consists of:
1. Heading for manipulated variable or
2. Headings for responding variable
Sample answer:
<table><tr><th>Metal</th><th>Observation</th></tr><tr><td></td><td></td></tr></table></td><td>1</td></tr>
</table>