Marking Scheme Chemistry Paper 3 Final Exam
Form Four 2008

1 (a)

Score	Explanation
3	*[Able to fill the table with **eight** answer correctly]* **Answer** 0.5, 0.8, 1.2, 1.5, 1.8, 1.8, 1.8, 1.8
2	[Able to state **six** answer accurately]
1	[Able to state **four** answer accurately]
0	*[No response or wrong response]*

1 (b)

Score	Explanation
3	[*Able to state hypothesis correctly*] **Example :** The lower/higher the volume of barium chloride solution is decreased/increased the height of precipitate
2	[*Able to state hypothesis almost correct*] **Example :** The height of precipitate increases/decreases when the volume of barium chloride solution is decreased/increased
1	[*Able to state an idea about the hypothesis*] **Example:** The volume of barium chloride effects the height of precipitate
0	*[No response or wrong response]*

1 (c)

Score	Explanation
3	*[Able to state the answer correctly]* **Example :** Barium chromate (VI)
2	[Able to state the answer less accurate] **Example:** Barium chromate
1	[Able to state the idea of the answer] **Example:** Chromate solution
0	*[No response or wrong response]*

1 (d)

Score	Explanation
3	*[Able to state the answer accurately with unit]* **Answer** 5.00 cm^3

2	*[Able to state the answer accurately without unit]* **Example :** 5.00 / 5
1	*[Able to give an idea]* **Example :** 6 / 7 / 8
0	*[No response or wrong response]*

1(e)

Score	Explanation
3	[Able to show the step of the calculation and their expression correctly] [Dapat menunjukkan langkah perhitungan dan ungkapan dengan betul] **Answer :** No. of mole of $BaCl_2$ = (MV) / 1000 = (0.5 x 5) / 1000 = 0.0025 mol
2	[Able to show the number of mole of $BaCl_2$ without their expression]
1	[Able to show the molarity of $BaCl_2$ // the answer without the step of the calculation]
0	*[No response or wrong response]*

1(f)

Score	Explanation
3	*[Able to write the ionic equation correctly]* **Example :** $Ba^{2+} + CrO_4^{2-} \rightarrow BaCrO_4$
2	*[Able to write the ionic equation less accurate or imbalanced]* **Example :** $Ba^{+} + CrO_4^{-} \rightarrow BaCrO_4$
1	*[Able to state an idea about the ionic equation]* **Example :** $BaCl_2 + K_2CrO_4 \rightarrow BaCrO_4 + 2KCl$
0	*[No response or wrong response]*

2(a)

score	Explanation
3	*[Able to state three variables accurately]* **Example :** Manipulated variable : Concentration of ammonia solution Responding variable : pH value Fixed variable : ammonia solution
2	*[Able to state any **two** variables accurately // any **three** variables less accurately]*

1	*[Able to state any one variable acurately// any two variables less accurately]*
0	*[No response or wrong response]*

2 (b)

Score	Explanation
3	*[Able to exhibit the tabulation of data accurately and uniformly]* Table contains topics and unit Example : **Concentration of ammonia solution /moldm^{-3}** | **pH value** 0.100 | 9.0 0.060 | 8.8 0.040 | 8.6 0.025 | 8.4 0.015 | 8.2 0.010 | 8.0 * Concentration = 3 decimal points, pH = 1 decimal point
2	*[Able to exhibit the tabulation of data accurately , **without unit**]*
1	*[Able to state an idea about the tabulation of data]* Table contains at least 2 colums and 2 rows.
0	*[No response or wrong response]*

2 (c)

Score	Explanation
3	*[Able to state the relationship between the concentration of OH^- ion and pH value accurately]* **Example :** The higher the concentration of OH^- ion,the higher the pH value// The lower the concentration of OH^- ion,the lower the pH value// When the concentration of OH^- ion is higher,the pH value is higherr// When the concentration of OH^- ion is lower, the pH value is lower.
2	*[Able to state the relationship between the concentration of OH^- ion and pH value less accurately]* **Example :** When the concentration of alkali increases/decreases, the pH value is higher/lower//concentration of OH^- ion is directly proportional to the pH value.
1	*[Able to state an idea about the concentration of alkali]* **Example:** The concentration of OH^- ion influences the pH value.
0	*[No response or wrong response]*

2 (d)

Score	Explanation
3	*[Able to give the statement correctly]* **Example :** Ammonia solution has low concentration of OH^- ion.
2	*[Able to give the statement less correctly]* **Example:** Ammonia solution is a weak alkali
1	*[Able to state an idea]* **Example :** Ammonia solution contains OH^- ion
0	*[No response or wrong response]*

2 (e)

Score	Explanation
3	*[Able to predict pH value correctly]* **Answer :** The pH value : $7.5 \leq pH < 8.0$
2	*[Able to predict pH value correctly]* **Answer :** The pH value : $7.0 < pH < 7.5$
1	*[Able to state an idea about pH value]* **Answer :** Any pH value between 1.0 to 14.0
0	*[No response or wrong response]*

3(a)

Score	Explanation
3	[Able to state the problem statement accurately] ***Example :*** *1. How can an iron key be coated with copper through electrolysis?* *Does electrolysis can be used to coat an iron key with copper?*
2	[Able to state the problem statement less accurately] **Example:** To study/ determine the electrolysis process to coat an iron key with nickel.
1	[Able to state an idea of problem statement] **Example:** To study the process/ uses of electrolysis
0	No response or wrong response

3 (b)

Score	Explanation
3	[Able to state all the variables accurately] **Example:** Manipulated variable : metal at the anode Responding variable : The result of the electroplating Fixed variable : Volume and concentration of nickel(II)sulphate solution// Value of electrical current.
2	[Able to state any two variables accurately]
1	[Able to state any one variable accurately]
0	No response or wrong response

3 (c)

Score	Explanation
3	[*Able to state hypothesis correctly*] **Example :** The types of metal at the anode effects the result of the electroplating
2	[*Able to state hypothesis almost correct*] **Example :** The result of the electroplating effects by the types of metal at the anode
1	[*Able to state an idea about the hypothesis*] **Example:** The metal at the anode effects the electrolysis
0	No response or wrong response

3(d)

Score	Explanation
3	[Able to give the list of the apparatus and materials correctly and completely] **Example:** Materials : nickel(II)sulphate solution, iron key, nickel, copper Apparatus : beaker, connecting wire with crocodile clip, ammeter, battery, rheostat.,

2	[Able to give the list of the apparatus and materials correctly but not complete] **Example:** Nickel(II)sulphate solution/copper(II)sulphate solution, nickel/copper, battery, connecting wire.
1	[Able to give an idea about the list of the apparatus and substances correctly] Any **one** of the materials and apparatus.
0	No response or wrong response

3(e)

Score	Explanation
3	[Able to state all the 5 steps in experiment correctly] Example: 1. $50cm^3$ copper(II)sulphate is measured and poured into a beaker. 2. Copper is connected to positive terminal of the battery while the iron key is connected to negative terminal of battery. // Copper act as anode while the iron key act as cathode. 3. Pair of copper and iron key is immersed into copper(II)sulphate solution. 4. The switch is turned on and 0.5 A electrical current is allowed to pass for about 40 minutes// The circuit is completed. 5. Any changes at the electrode is observed. 6. Repeat steps 1 to 5 using nickel(II)sulphate solution and nickel metal.
2	[Able to state 3 steps of procedures to conduct an experiment correctly]
1	[Able to state 2 minimum steps correctly]
0	No response or wrong response

3 (f)

<table>
<tr><th>Score</th><th>Explanation</th></tr>
<tr><td>3</td><td>Able to plan and exhibit the tabulation of data that includes the following information.
1. columns and rows
2. observation at the iron key and nickel metal

Example:
<table><tr><td>Type of metal at anode</td><td>Observation at iron key</td></tr><tr><td>Copper metal</td><td></td></tr><tr><td>Nickel metal</td><td></td></tr></table></td></tr>
<tr><td>2</td><td>Able to plan and exhibit the tabulation of data that includes the following information.
3. columns and rows
4. observation
Example
<table><tr><td>Anode</td><td>Observation</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>1</td><td>[Able to state an idea about the tabulation of data less accurately]

- Minimum 2 columns/rows
<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td></tr>
<tr><td>0</td><td>No response or wrong response</td></tr>
</table>