Section A:

1. The positive electrode is called the _____.
2. The negative electrode is called the _____.
3. In an aqueous solution, water molecules break down into…

   Tick (✓) **one** box.

H_2 and OH ions. ☐ H^+ and OH^- ions. ☐ H^+ and O^- ions. ☐

4. Write the correct words in the gaps to complete the sentences.

The ions discharged when an aqueous solution is electrolysed using inert _____ depend on the relative _____ of the elements involved. At the negative electrode, _____ is produced if the metal is more reactive than hydrogen. At the positive electrode, _____ is produced unless the solution contains halide ions when the halogen is produced.

5. Aqueous sodium chloride solution was electrolysed using inert electrode.

(a) State the ions found in sodium chloride solution.

_____

(b) State which of these ions are attracted to the positive electrode.

_____

(c) At the positive electrode, a gas was produced.
Name this gas an explain why it was produced at the positive electrode.

_____

_____

(d) State what was produced at the negative electrode and explain why.

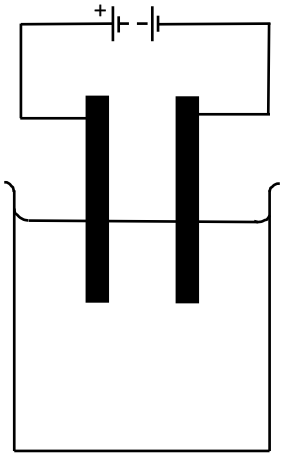
_____

_____

Section B

A student wanted to carry out electrolysis on different aqueous salt solutions.

They drew a diagram of the equipment used, shown below.



1. Add the following labels to the diagram: salt solution, power supply, inert electrodes, beaker, anode, cathode.

2. Complete the table below.

   Use the reactivity series and the list of common ions.

Experiment number	Aqueous salt solution electrolysed	The ions in the aqueous salt solution	Produced at anode	Produced at cathode
A	Potassium iodide			
B	Silver nitrate		Oxygen	
C	Copper sulphate			

3. The student wanted to test whether hydrogen gas was being produced.

   Describe how to test for hydrogen gas.

   _____

   _____

4. (a) Write the two half equations to show what happens at the electrodes in **experiment A** in the table. *(HT only)*

_____

_____

(b) Define oxidation and reduction.

Oxidation - _____

_____

Reduction - _____

_____

(c) Using the half equations you wrote in part (a) state what is being **reduced**. Explain your answer. *(HT only)*

_____

_____

(d) Using the half equations you wrote in part (a) state what is being **oxidised**. Explain your answer. *(HT only)*

_____

_____

5. (a) Complete the two half equations below to show what happens at the electrodes in **experiment B** in the table. *(HT only)*

Ensure they are balanced.

At the anode – _____ $OH^- \rightarrow O_2$ + _____ H_2O + _____ e^-

At the cathode – _____

(b) Using the half equations you wrote in part (a) state what is being **reduced**. Explain your answer. *(HT only)*

_____

_____

(c) Using the half equations you wrote in part (a) state what is being **oxidised**. Explain your answer. *(HT only)*

_____

_____

Section C

1. Explain why ionic compounds can be electrolysed when liquid.

_____

_____

2. State a difference between molten sodium fluoride and an aqueous solution of sodium fluoride.

_____

_____

3. State what would be produced at the cathode when **molten** sodium fluoride was electrolysed.

_____

4. An **aqueous solution** of sodium fluoride was electrolysed using graphite electrodes.

(a) State **two** reasons why graphite was used for the electrodes.

1. _____
2. _____

(b) The product formed at the cathode was different to when molten sodium fluoride was electrolysed. Explain why.

_____

_____

_____

(c) Fluorine gas is formed at the anode.

Explain why fluorine is a gas at room temperature. Use your knowledge of structure and bonding.

_____

_____

(d) Draw a dot and cross diagram to show one molecule of fluorine.