Website: contoureducation.com.au | **Phone:** 1800 888 300
Email: hello@contoureducation.com.au

VCE Chemistry ¾
AOS 2 Revision I [2.5]
Test

20 Marks. 1 Minute Reading. 16 Minutes Writing

Results:

Test Questions	_____ / 15
Extension	_____ / 5

Section A: Test Questions (15 Marks)

Question 1 (2 marks)

Tick whether the following statements are **true** or **false**.

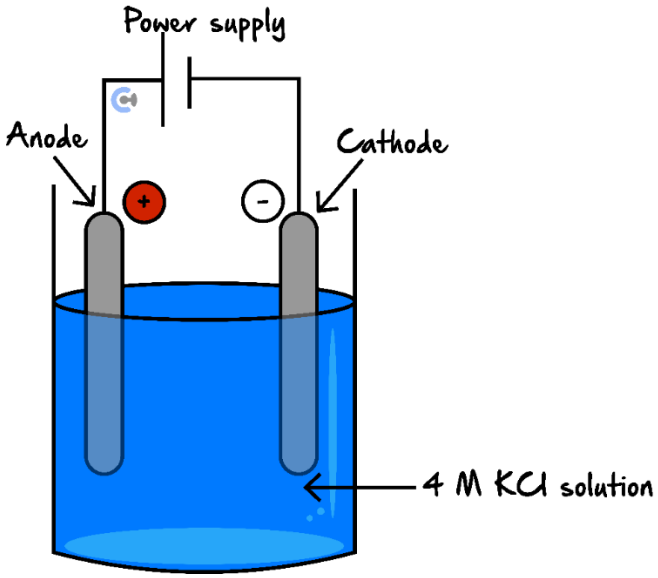
Statement	True	False
a. In a secondary cell, during recharge, the polarities of the electrodes swap compared to their polarities during discharge.		
b. The artificial photosynthesis cell is constructed to produce hydrogen gas, and does so by converting sunlight directly into chemical energy.		
c. The life of a battery can be extended by storing it in warm conditions so that the chemicals do not freeze and clog up the electrodes.		
d. In electroplating, the concentration of the electrolyte remains constant, regardless of the choice of material at the anode.		

Space for Personal Notes

Question 2 (13 marks)

Potassium hydroxide, KOH, is made commercially by the electrolysis of concentrated potassium chloride, KCl, solution.

A chemist aims to make a solution of aqueous potassium hydroxide, KOH(aq) using electrolysis. The electrolysis cell is shown below. It is operated at standard laboratory conditions (SLC).



a.

i. Explain why potassium bromide, KBr, or potassium iodide, KI could not replace KCl as the electrolyte solution, using the cell shown above. (2 marks)

_____

_____

_____

_____

ii. When the power supply is turned on, the chemist observes bubbles forming at the anode. Use the electrochemical series to predict the gas formed at the anode. (1 mark)

_____

iii. A faint smell of chlorine was detected above the anode. Explain this observation. (2 marks)

_____

_____

_____

_____

iv. Write a balanced equation for the **overall** reaction that occurs in the electrolysis cell that is consistent with the explanation given in **part a.iii.** (2 marks)

_____

_____

v. Identify a safety issue with this cell and how the risk(s) can be minimised. (2 marks)

_____

_____

_____

_____

b. In a commercial electrolysis cell that produces KOH, the two electrodes are separated by a membrane. State one reason why this membrane exists. (1 mark)

_____

_____

c. KOH is also used as part of a rechargeable nickel-cadmium, NiCd, battery. The chemical reactions that occur in an NiCd battery during discharge are:

$$Cd(s) + 2OH^-(aq) \longrightarrow Cd(OH)_2(s) + 2e^-$$

$$2NiO(OH)(s) + 2H_2O(l) + 2e^- \longrightarrow 2Ni(OH)_2(s) + 2OH^-(aq)$$

i. Identify the reducing agent in these reactions during **discharge**. (1 mark)

_____

ii. Identify the oxidising agent in these reactions during recharge. (1 mark)

_____

iii. State a purpose of KOH in the NiCd battery. (1 mark)

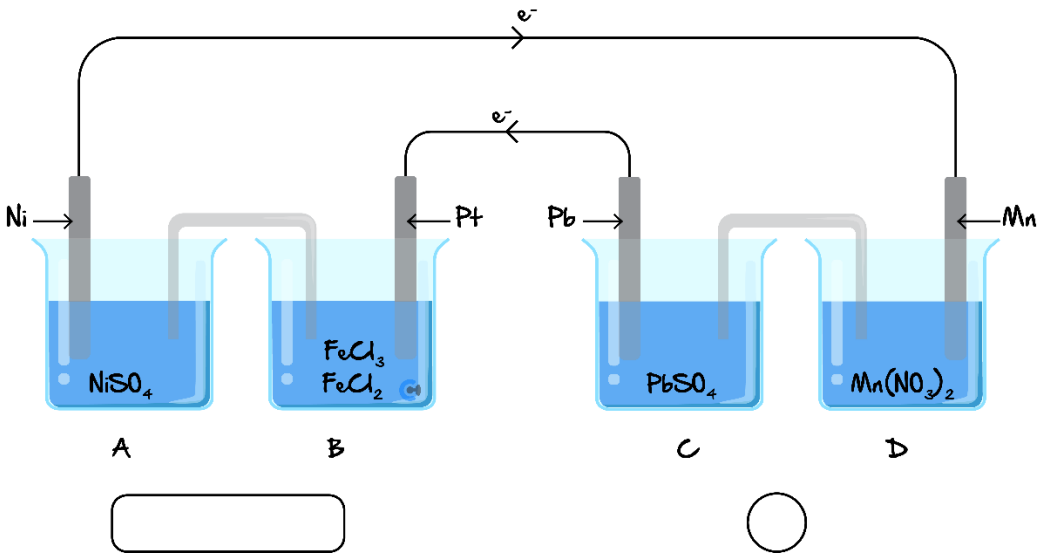
_____

Space for Personal Notes

Section B: Extension (5 Marks)

Question 3 (5 marks)

The following set-up was constructed by Shriya using aqueous 1.0 *M* solutions at SLC:



a. Determine whether the reaction is occurring between the beakers *A* and *B* is galvanic or electrolytic, and subsequently, state this in the box provided beneath (write either 'galvanic' or 'electrolytic'). (1 mark)

b. State the polarity of the electrode *D* by placing a '+' or '−' sign in the circle provided below the beaker *D*, **and** write the half-equation occurring at this electrode as the cell operates. (1 mark)

_____

c. If this cell were operating for 10 minutes, determine which **two electrodes** would have the greatest changes in mass, and briefly explain what can be concluded about the other electrodes' masses. (2 marks)

_____

_____

_____

_____

_____

d. Had molten conditions been used, explain whether there would be any difference(s) in the reactions taking place, and if so, outline what the difference(s) would be. (1 mark)

_____

_____

Space for Personal Notes

CONTOUREDUCATION

Website: contoureducation.com.au | **Phone:** 1800 888 300 | **Email:** hello@contoureducation.com.au

VCE Chemistry ¾

Free 1-on-1 Support

Be Sure to Make The Most of These (Free) Services!

- Experienced Contour tutors (45 + raw scores, 99 + ATARs).
- For fully enrolled Contour students with up-to-date fees.
- After school weekdays and all-day weekends.

1-on-1 Video Consults	Text-Based Support
➢ Book via bit.ly/contour-chemistry-consult-2025 (or QR code below). ➢ One active booking at a time (must attend before booking the next).	➢ Message +61 440 137 304 with questions. ➢ Save the contact as "Contour Chemistry".

Booking Link for Consults
bit.ly/contour-chemistry-consult-2025

Number for Text-Based Support
+61 440 137 304