Quiz (Simple Chemical Cells)

Section A: Multiple-choice

- 1. Which of the following is the correct descending order of metals in the Electrochemical Series of metals?
 - A. K > Ca > Na > AI
 - C. AI > Ca > Na > K

B. K > Na > Ca > AlD. Al > Na > Ca > K

2. The following diagram shows a simple chemical cell.



Metal X is more reactive than metal Y. Which of the following methods can increase the voltage of the cell?

- (1) Replace metal Y with a metal which is more reactive than X
- (2) Replace the dilute acid with a more concentrated acid
- (3) Replace metal Y with a metal which is less reactive than Y
- A. (1) and (2) only
- C. (2) and (3) only

- B. (1) and (3) only D. (1), (2) and (3)
- 3. Which of the following chemical cells would give a negative voltage when iron is connected to the positive terminal of the voltmeter?
 - A. Pb/Fe C. Al/Fe

- B. Zn/Fe
- D. Mg/Fe

4. Consider the orange cell below:



Which of the following statements about the cell are correct?

- (1) The orange contains electrolytes.
- (2) Electrons flow from lead to zinc in the external circuit.
- (3) Zinc is the negative electrode.
- A. (1) and (2) only

B. (1) and (3) only

C. (2) and (3) only

- D. (1), (2) and (3)
- 5. What are the functions of the porous device in a Daniell cell?
 - (1) To prevent the mixing of electrolytes
 - (2) To provide ions to balance the charges in the electrolytes
 - (3) To complete the circuit by allowing ions to move between the two half cells
 - A. (1) and (2) only
 - C. (2) and (3) only

- B. (1) and (3) only D. (1), (2) and (3)
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- 6. Which of the following equations represents the reaction occurred at the copper electrode?
 - A. $Cu^{2+} + 2e^{-} \longrightarrow Cu$
 - C. $2H^+ + 2e^- \longrightarrow H_2$

- B. $C \cup \longrightarrow C \cup^{2+} + 2e^{-}$
- D. $4OH^- \longrightarrow 2H_2O + O_2 + 4e^-$

- 7. Which of the following methods would increase the current in the cell?
 - A. Add water to dilute sulphuric acid
 - B. Place the two metal electrodes further apart
 - C. Use zinc to replace the copper electrode
 - D. Use silver to replace the copper electrode
- 8. The following set-ups can be used to investigate the reactivity of metals A, B and C. Hydrogen evolves only on one of the metals.







dilute sulphuric acid dilute



dilute sulphuric acid

The order of reactivity of the metals is

A. A > B > C.

C. B > C > A.

B. C > A > B. D. C > B > A.

Section B: Structured questions

Consider the following simple chemical cell:



- (a) With the aid of a chemical equation, explain why it is NOT appropriate to prepare the salt bridge by soaking a strip of filter paper with potassium chloride solution.
- (b) Suggest how to prepare the salt bridge.
- (c) State the direction of electron flow in the external circuit.
- (d) With the aid of a half equation, state and explain the observable change in the iron-iron ion half cell.

Suggested Answer

Section A

1.	A	5.	В
2.	С	6.	С
3.	A	7.	D
4.	В	8.	D

Section **B**

- (a) Chloride ions form a precipitate with silver ions. $Ag^+(aq) + Cl^-(aq) \longrightarrow AgCl(s)$
- (b) Soak a strip of filter paper with potassium nitrate solution (Accept other reasonable electrolytes)
- (c) From iron to silver
- (d) The colour of the solution becomes deeper as the concentration of iron(II) ions increases. Fe \longrightarrow Fe²⁺ + 2e⁻