19.1 Electrochemical Cells

Question Paper

Course	DP IB Chemistry
Section	19. Redox Processes (HL only)
Topic	19.1 Electrochemical Cells
Difficulty	Easy

Time allowed: 10

Score: /5

Percentage: /100

Question 1

Consider these standard electrode potentials.

$$Fe^{2+}(aq) + 2e^- \rightleftharpoons Fe(s) \quad E^\ominus = -0.45\ V$$

$$Cu^{2+}(aq) + 2e^- \rightleftharpoons Cu(s) \quad E^\ominus = +0.15\ V$$

Which is the correct working to determine $E^\ominus_{cell}$?

A. $E^\ominus_{cell} = 0.15 - (-0.45)$

B. $E^\ominus_{cell} = 0.15 + (-0.45)$

C. $E^\ominus_{cell} = (-0.45) - 0.15$

D. $E^\ominus_{cell} = 0.15 \times (-0.45)$

[1 mark]

Question 2

Which of the following is not a condition for the standard hydrogen electrode (SHE)?

A. 1.00 mol dm^{-3} HCl

B. Hydrogen gas with a pressure of 100 Pa

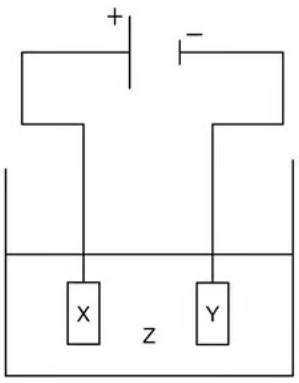
C. Temperature of 298 K

D. Platinum electrodes

[1 mark]

Question 3

Which combination would electroplate an object with silver?



	X	Y	Z
A.	Object to be plated	Silver	Silver chloride
B.	Silver	Object to be plated	Hydrochloric acid
C.	Object to be plated	Silver	Water
D.	Silver	Object to be plated	Silver nitrate

[1 mark]

Question 4

What are the products for the electrolysis of **concentrated** sodium chloride solution using inert electrodes?

	Anode	Cathode
A.	$O_2(g)$	$H_2(g)$
B.	$H_2(g)$	$O_2(g)$
C.	$Cl_2(g)$	$H_2(g)$
D.	$H_2(g)$	$Cl_2(g)$

[1 mark]

Question 5

A voltaic cell is made by connecting two half-cells represented by the half-equations below.

$$Al^{3+}(aq) + 3e^- \rightleftharpoons Al(s) \quad E^{\ominus} = -1.66\ V$$

$$Sn^{2+}(aq) + 2e^- \rightleftharpoons Sn(s) \quad E^{\ominus} = +0.14\ V$$

Which statement is correct about this voltaic cell?

A. The cell representation is $Al(s) \mid Al^{3+}(aq) \parallel Sn^{2+}(aq) \mid Sn(s)$

B. The $Al^{3+}(aq)$ / $Al(s)$ electrode is the cathode

C. The cell representation is $Al^{3+}(aq) \mid Al(s) \parallel Sn(s) \mid Sn^{2+}(s)$

D. The $Sn^{2+}(aq)$ / $Sn(s)$ electrode is the anode

[1 mark]