Q1. Which solution will allow greater conductance of electricity, 1M NaCl at 293 K or 1M NaCl at 323 K and why ?

Q2. What does the negative value of $E°_{cell}$ indicate?

Q3. Why is the equilibrium constant K, related to only $E°_{cell}$ and not E_{cell}?

Q4. What is the sign of ΔG for an electrolytic cell?

Q5. Rusting of iron is quicker in saline water than in ordinary water. Why is it so?

Q6. What would happen if the protective tin coating over an iron bucket is broken in some places?

Q7. Can a nickel spatula be used to stir a solution of Copper Sulphate? Justify your answer $\left(E°_{Ni^{2+}/Ni} = -0.25\ V\ ; E°_{Cu^{2+}/Cu} = 0.34\ V\right)$

Q8. Which out of 0.1 M HCl and 0.1 M NaCl, do you expect have greater Λ^{α}_{m} and why?

Q9. Three iron sheets have been coated separately with three metals A, B, C whose standard electrode potentials are given below:

	A	B	C	Iron
E°_{value}	- 0.46 V	– 0.66 V	– 0.20 V	– 0.44 V

Identify in which rusting will take place faster when coating is damaged

Q10. Which will have greater molar conductivity? Solution containing 1 mol KCl in 200 cc or 1 mol of KCl in 500 cc.

Q11. .

a) How will the value of E_{cell} change in an electrochemical cell involving the following reaction of the concentration of Ag^{+} (aq) is increased?

b) What will be e. m. f. when the cell reaches equilibrium?

$$Mg_{(s)} + 2\ Ag^{+}_{(aq)} \rightarrow Mg^{+2}_{(aq)} + Ag_{(s)}$$

Q12. In a cell reaction, the equilibrium constant K is less than one. Is E° for the cell positive or negative? What will be the value of K of $E°_{cell} = 0$?

Q13. Knowing that:

$$Cu^{+2}_{(aq)} + 2e^{-1} \rightarrow Cu_{(s)}\ \ E^{o} = +0.34\ V$$

$$2Ag^{+1}_{(aq)} + 2e^{-1} \rightarrow Ag_{(s)}\ \ E^{o} = +0.80\ V$$

Reason out whether, 1 M $AgNO_3$ solution can be stored in Copper Vessel or 1 M $CuSO_4$ solution in Silver Vessel

Q14. What is the number of electrons in one Coulombs of electricity?

Q15. Which of the following pairs will have greater conduction and why?

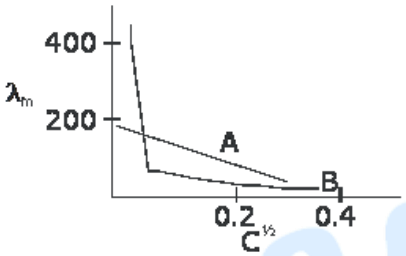
a) Copper wire at 25 °C and Copper wire at 50 °C.

b) M acetic acid solution or 1 M acetic acid solution?

Q16. The following curve is obtained when molar conductivity (Λ_M) is plotted against the square root of concentration for 2 electrolytes A and B.

(a) What can you say about the nature of the two electrolytes A and B?

(b) How you will account for the increase in molar conductivity (Λ_M) for the electrolytes A and B on dilution?



Q17. Iron and nickel are used to make electrochemical cell by using a salt bridge to join a half cell containing 1 M $Fe^{+2}_{(aq)}$ in which a strip of iron has been immersed to a second half cell which contains 1 M $Ni^{+2}_{(aq)}$ in which a strip of Ni has been immersed ? A voltmeter is connected between the two metal strips:

$E^{O}_{Fe^{+2}/Fe_{(s)}} = -0.44$ V; $E^{O}_{Ni^{+2}/Ni_{(s)}} = -0.25$ V

a) Write the name of the cathode and anode.

b) Write the half reactions involved?

c) What would be the effect on the Voltmeter reading if Fe^{2+} concentration were increased?

Q18. Consider the electrochemical cell :

Zn (s) / Zn^{2+}(aq) // Cu^{2+}(aq) / Cu. It has an electrical potential of 1.1 V when concentration of Zn^{2+} and Cu^{2+} ions is unity. State the direction of flow of electrons and also specify if Zinc and Copper are deposited or dissolved at their respective electrodes. When

a) An external opposite potential of 0.8 V is applied.

b) An external opposite potential of 1.1 V is applied.

c) An external opposite potential of 1.4 V is applied.

Q19. Given that:

$CO^{+3} + e^{-1} \rightarrow CO^{+2}$ $\quad E^{o} = 1.82V$

$2H_2O \rightarrow O_2 + 4H^{+} + 4e^{-1}$ $\quad E^{o} = -1.23V$

Explain why CO^{3+} is not stable in aqueous solution?

Q20. For the reaction :

$Ag^{+} + Hg \rightarrow Ag + Hg_2^{+2}$

$E^{O}_{Ag^{+}/Ag} = +0.80V$; $E^{O}_{Hg_2^{+2}/Hg} = +0.79V$

Predict the direction in which the reaction will proceed if: $[Ag^{+}] = 10^{-1}$ mol/Lit $[Hg^{2+}] = 10^{-3}$ mol/Lit