ELECTROCHEMISTRY

1. In a galvanic cell, which of the following statements is true?
A) Oxidation takes place at the cathode
B) Electrons flow from cathode to anode
C) Cathode is positive
D) Salt bridge allows the flow of electrons

2. Standard electrode potential of Zn^{2+}/Zn is -0.76 V and that of Cu^{2+}/Cu is +0.34 V. The EMF of the cell $Zn|Zn^{2+}||Cu^{2+}|Cu$ is:
A) -1.10 V
B) +1.10 V
C) +0.42 V
D) -0.42 V

3. Which of the following statements is false about electrolytic cells?
A) Non-spontaneous reaction occurs
B) External voltage is applied
C) Cathode is negative
D) Electrons flow from cathode to anode

4. The cell reaction is spontaneous when:
A) $E°_{cell}$ is negative
B) ΔG is positive
C) $E°_{cell}$ is zero
D) $E°_{cell}$ is positive

5. The unit of conductivity is:
A) S·m
B) $S \cdot cm^{-1}$
C) ohm·m
D) ohm·cm

6. Molar conductivity (Λm) of a solution increases with:
A) Increase in concentration
B) Increase in temperature
C) Decrease in dilution
D) Decrease in ion mobility

7. The equation to calculate EMF using Nernst Equation is:
A) $E = E° - RT/nF \ lnQ$
B) $E = E° + RTnF \ lnQ$
C) $E = E° - 2.303nF/RT \ logQ$
D) $E = E° + 2.303RTnF \ logQ$

8. A current of 1 A is passed through molten NaCl for 965 seconds. The mass of Na deposited is:
A) 1.15 g
B) 2.3 g

C) 0.575 g
D) 0.115 g

9. Faraday's first law of electrolysis states that:
A) Mass deposited is proportional to time
B) Mass deposited is inversely proportional to current
C) Mass deposited is proportional to charge passed
D) Mass deposited is constant

10. In the electrolysis of $CuSO_4$ solution using copper electrodes, what happens at the anode?
A) Cu^{2+} is reduced
B) Cu is oxidized
C) SO_4^{2-} is oxidized
D) Water is reduced

11. Which metal cannot be purified using electrolytic refining?
A) Copper
B) Zinc
C) Sodium
D) Silver

12. The standard hydrogen electrode (SHE) has an electrode potential of:
A) +0.00 V
B) -0.76 V
C) +1.00 V
D) -1.00 V

13. Which of the following conduct electricity in molten state only?
A) NaCl
B) HCl
C) NH_3
D) NaOH

14. The main function of a salt bridge is to:
A) Increase EMF of the cell
B) Transfer electrons
C) Maintain electrical neutrality
D) Reduce cell resistance

15. Conductivity of an electrolyte solution decreases with:
A) Increase in temperature
B) Increase in ion concentration
C) Dilution
D) Increase in mobility

16. Which of the following ions has highest molar conductivity at infinite dilution?
A) H^+
B) Na^+
C) K^+
D) Ca^{2+}

17. Electrolysis of aqueous NaCl gives which gas at the anode?
A) H_2
B) Cl_2
C) O_2
D) N_2

18. In electrochemical cells, electrons flow from:
A) Cathode to anode through wire
B) Anode to cathode through wire
C) Salt bridge to wire
D) Electrolyte to salt bridge

19. Which factor does not affect the electrode potential of a metal electrode?
A) Temperature
B) Concentration of electrolyte
C) Surface area of electrode
D) Nature of metal

20. The correct order of molar conductivity at infinite dilution is:
A) $Na^+ < K^+ < H^+$
B) $H^+ < Na^+ < K^+$
C) $K^+ < H^+ < Na^+$
D) $Na^+ < H^+ < K^+$

ANSWERS-1.(C) 2.(B) 3.(D) 4.(D) 5.(B) 6.(B) 7.(A) 8.(A) 9.(C) 10.(B) 11.(C) 12.(A) 13.(A)

14.(C) 15.(C) 16.(A) 17.(B) 18.(B) 19.(C) 20.(A)