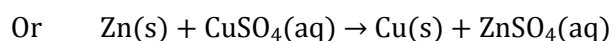
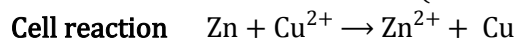
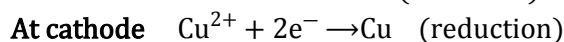
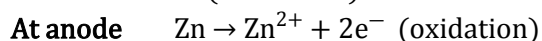


Topic :- Electro Chemistry

2 (b)
In Galvanic cell (Daniel cell) the electrical energy is produced from chemical reactions.



3 (b)
$$\Lambda_{\text{AcOH}}^{\infty} = \Lambda_{\text{AcONa}}^{\infty} + \Lambda_{\text{HCl}}^{\infty} - \Lambda_{\text{NaCl}}^{\infty}$$
$$= 91.0 + 426.2 - 126.5$$
$$= 390.7$$

4 (b)
The metal with more E_{OP}° is oxidised.

5 (d)
$$E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{0.05915}{n} \log Q$$

For standard hydrogen electrode,
 $E_{\text{cell}}^{\circ} = 0.00V$

$$\therefore E_{\text{cell}} = - \frac{0.05915}{n} \log Q$$

Given, pH = 1.0

$$\therefore [\text{H}^+] = 1 \times 10^{-1}$$

$$E_{\text{cell}} = - \frac{0.05915}{n} \log \frac{1}{[\text{H}^+]}$$

[∵ The reaction occurring is $2\text{H}^+ + 2e^- \rightarrow \text{H}_2$]

$$= + \frac{0.05915}{1} \log(\text{H}^+)$$

$$= 0.05915 \log(10^{-1})$$

$$= - 0.05915 V$$

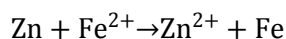
$$= - 59.15 \text{ mV}$$

6 (c)
$$\Lambda_{\text{eq}}^{\circ} = \kappa \times \frac{1000}{\text{normality}}$$

$$= \frac{0.005 \times 1000}{0.01} = 500 \text{ ohm}^{-1} \text{ cm}^2 \text{ equiv}^{-1}$$

7 **(a)**
 E_{OP}° of Mg > E_{OP}° of Al.

8 **(a)**
 For the given cell, reaction is



$$E = E^\circ - \frac{0.0591}{n} \log \frac{C_1}{C_2}$$

$$\text{or, } E^\circ = E + \frac{0.0591}{n} \log \frac{C_1}{C_2}$$

$$= 0.2905 + \frac{0.0591}{2} \log \frac{10^{-2}}{10^{-3}} = 0.32 \text{ V}$$

$$E^\circ = \frac{0.0591}{2} \log K_c$$

$$\therefore \log K_c = \frac{0.32 \times 2}{0.0591} = \frac{0.32}{0.0295}$$

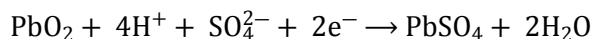
$$K_c = 10^{\frac{0.32}{0.0295}}$$

9 **(d)**
 When Alcad storage battery is discharged, the following cell reactions take place.

At anode



At cathode



10 **(d)**
 $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$
 According to Nernst equation,

$$E = E^\circ + \frac{0.0591}{n} \log \frac{1}{[\text{H}^+]^2}$$

$$E = 0 - \frac{0.0591}{2} \log [\text{H}^+]^2$$

$$= -0.0591 \text{ pH}$$

11 **(a)**
 $E_{\text{Fe}^{2+}/\text{Fe}}^\circ = -0.441 \text{ V}$
 $E_{\text{Fe}^{3+}/\text{Fe}}^\circ = -0.771 \text{ V}$
 $E_{\text{cell}}^\circ = E_{OP_{\text{Fe}/\text{Fe}^{2+}}}^\circ + E_{RP_{\text{Fe}^{3+}/\text{Fe}^{2+}}}^\circ$ (See redox change)
 $= +0.441 + 0.771 = 1.212 \text{ V}$

12 **(b)**
 $E_{OP_{Zn}}^{\circ} > E_{OP_{Cu}}^{\circ}$ or $E_{RP_{Zn}}^{\circ} < E_{RP_{Cu}}^{\circ}$

13 **(b)**
 H_2SO_4 is strong electrolyte.

14 **(c)**
$$\Lambda_v = \frac{\Lambda^0}{100}$$
$$\therefore \alpha = \frac{\Lambda_v}{\Lambda^0} = \frac{\Lambda^0}{100\Lambda^0} = 0.01$$

15 **(b)**
 $\frac{1}{2}H_2 | H^+ || Ag^+ | Ag$

$$E_{cell}^{\circ} = E_{cathode}^{\circ} - E_{anode}^{\circ}$$

$$= E_{Ag^+/Ag}^{\circ} - E_{H^+/1/2H_2}^{\circ}$$

$$= (0.80) - (0.0) = 0.80 \text{ V}$$

16 **(a)**
Ions move towards opposite electrodes due to coulombic forces of attraction.

17 **(c)**
More is E_{RP} , more is the tendency to get reduced.
 E_{RP} for Ag is maximum.

18 **(d)**
 E_{OP} for Li/Li⁺ is maximum in these.

19 **(b)**
250mL of 1 M $AgNO_3$ contain $= \frac{250}{1000}$
 $= 0.25$ mole $AgNO_3$

\therefore Electricity required to liberate 1 g equivalent of metal
 $= 96500 \text{ C}$

\therefore Electricity required to liberate 0.25 g equivalent of metal
 $= \frac{96500 \times 0.25}{1}$
 $= 24125 \text{ C}$

20 **(b)**
1 faraday = 1 eq. of Cu = 1/2 mole Cu
 $= N/2$ atoms of Cu.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	B	B	B	D	C	A	A	D	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	A	B	B	C	B	A	C	D	B	B

PE