

### Topic :- Electro Chemistry

- 1 (c)  
1 mole of monovalent metal ion means charge of  $N$  electrons  
*i.e.*, 96500 C or 1 faraday.
- 2 (a)  
For strong electrolytes  $\Lambda$  vs  $\sqrt{c}$  plots are straight line.
- 3 (d)  
The metal should be capable of adsorbing H (*e.g.*, Pt).
- 4 (b)  
Laws of electrolysis were proposed by Michael Faraday in 1833.
1. **Faraday's first law** "The mass of any substance deposited or liberated at any electrode is directly proportional to the quantity of electricity passed".  
*i.e.*,  $w \propto Q$   
where,  $w$  = mass of ions liberated in gram  
 $Q$  = quantity of electricity passed in coulombs.
2. **Faraday's second law** "When the same quantity of electricity is passed through different electrolytes, the masses of different ions liberated at the electrodes are directly proportional to their chemical equivalents."  
*i.e.*,  $\frac{w_1}{w_2} = \frac{E_1}{E_2}$  OR  $\frac{Z_1it}{Z_2it} = \frac{E_1}{E_2}$ .
- 5 (d)  
Strong electropositive metals (I group, II group and Al) cannot be obtained at cathode by electrolysing their aqueous salt solutions.
- 6 (b)  
$$\frac{\text{Weight of Cu}}{\text{Weight of H}_2} = \frac{\text{Eq.wt.of Cu}}{\text{Eq.wt.of H}_2}$$
$$\frac{\text{Weight of Cu}}{0.504} = \frac{63.6/2}{1}$$
$$\therefore \text{Weight of Cu} = 15.9 \text{ g}$$
- 7 (b)  
In presence of Hg electrode preferential discharge of  $\text{Na}^+$  (in comparison to  $\text{H}^+$ ) occurs.

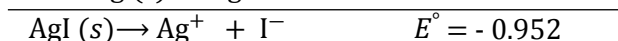
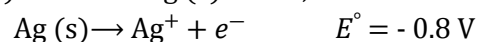
8 **(b)**  
Specific conductivity of a solution decreases with dilution.

9 **(b)**  
Passage of current in electrolytic solution is due to migration of ions towards opposite electrodes.

10 **(c)**  
 $E_{\text{cell}} = E_{OP_L} + E_{RP_R} = -E_{RP_L} + E_{RP_R}$ .

11 **(a)**  
 $E^\circ = E$ , when  $[Zn^{2+}] = 1M$ ;  
Also process is  $Zn^{2+}(aq) + 2e \rightarrow Zn(s)$ .

12 **(d)**  
 $AgI(s) + e^- \rightleftharpoons Ag(s) + I^-$  ;  $E^\circ = 0.152 V$



$$E_{\text{cell}}^\circ = \frac{0.059}{n} \log K_{sp}$$

$$-0.952 = \frac{0.059}{1} \log K_{sp}$$

$$\log K_{sp} = \frac{-0.952}{0.059} = -16.135$$

13 **(a)**  
 $\Lambda_{CH_3COOH}^\infty = \Lambda_{CH_3COONa}^\infty + \Lambda_{HCl}^\infty - \Lambda_{NaCl}^\infty$

14 **(a)**  
At cathode :  $Cu^{2+} + 2e \rightarrow Cu$ ;  
At anode :  $Cu \rightarrow Cu^{2+} + 2e$

15 **(d)**  
$$\frac{\text{Wt. of Cu deposited}}{\text{Wt. of H}_2 \text{ produced}} = \frac{\text{eq. wt. of Cu}}{\text{eq. wt. of H}}$$
$$\frac{0.16}{\text{wt. of H}_2} = \frac{64/2}{1} = \frac{32}{1}$$

$$\text{Wt. of H}_2 = \frac{0.16}{32} = 5 \times 10^{-3} \text{ g}$$

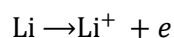
Volume of  $H_2$  liberated at STP

$$= \frac{22400}{2} \times 5 \times 10^{-3} \text{ cc}$$

$$= 56 \text{ cc}$$

16 **(a)**  
Faraday's laws are independent of external factors.

17 **(a)**  
 $E_{OP}^\circ$  for Li is more,



Thus, Li is strong oxidant.

18 **(d)**  
All are electrolytic cells.

19 **(a)**  
96500 C or 1F will liberate 1 eq. of O<sub>2</sub> or 1/4 mole O<sub>2</sub> or 5.6 litre O<sub>2</sub> at NTP.

20 **(a)**  
96500C or 1 Faraday charge is required for the deposition of 1 g-equivalent of a substance.

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

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