I. Electrolysis and Faraday's laws

1. What current is to be passed for 0·25 s for deposition of a certain weight of metal which is equal to its electrochemical equivalent ?
   (*a*) 4 A (*b*) 100 A
   (*c*) 200 A (*d*) 2 A

2. In an experiment 0·04 F was passed through 400 ml of 1 M solution of NaCl. What would be the pH of the solution after the electrolysis ?
   (*a*) 8 (*b*) 10
   (*c*) 13 (*d*) 6
   (*e*) 9

3. Electrolysis of dilute aqueous NaCl solution was carried out by passing 10 milli ampere current. The time required to liberate 0·01 mol of H_2 gas at the cathode is (1 Faraday = 96500 C mol^{-1})
   (*a*) $9{\cdot}65 \times 10^4$ sec (*b*) $19{\cdot}3 \times 10^4$ sec
   (*c*) $28{\cdot}95 \times 10^4$ sec (*d*) $38{\cdot}6 \times 10^4$ sec
   (IIT 2008)

4. Two faradays of electricity are passed through a solution of $CuSO_4$. The mass of copper deposited at the cathode (at. mass of Cu = 63·5 amu)
   (*a*) 2 g (*b*) 127 g
   (*c*) 0 g (*d*) 63·5 g
   (JEE Main 2015)

5. One faraday of electricity is passed through molten Al_2O_3, aqueous solution of $CuSO_4$ and molten NaCl taken in three different electrolytic cells connected in series. The mole ratio of Al, Cu and Na deposited at the respective cathodes is
   (*a*) 2 : 3 : 6 (*b*) 6 : 2 : 3
   (*c*) 6 : 3 : 2 (*d*) 1 : 2 : 3
   (*e*) 3 : 6 : 2 (Kerala PET 2010)

6. 9·65 C electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus obtained is completely converted into a Grignard reagent. The number of moles of the Grignard reagent obtained is
   (*a*) 5×10^{-4} (*b*) 1×10^{-4}
   (*c*) 5×10^{-5} (*d*) 1×10^{-5}
   (Karnataka CET 2010)

7. A current is passed through two cells connected in series. The first cell contains X $(NO_3)_3$ (*aq*) and the second cell contains Y $(NO_3)_2$ (*aq*). The relative atomic masses of X and Y are in the ratio 1 : 2. What is the ratio of the liberated mass of X to that of Y ?
   (*a*) 3 : 2 (*b*) 1 : 2
   (*c*) 1 : 3 (*d*) 3 : 1
   (*e*) 2 : 1

8. A current of 2·0 A passed for 5 hours through a molten metal salt deposits 22·2 g of metal (At wt. = 177). The oxidation state of the metal in the metal salt is
   (*a*) +1 (*b*) +2
   (*c*) +3 (*d*) +4.