

**Solution27\_17:**

Time for flow of charge,  $t = 60 \times 60 \text{ s} = 3600 \text{ s}$

Total Charge,  $Q = 10,000 \text{ C}$

Cross section of wire,  $A = 50 \times 10^{-6} \text{ m}^2$

Therefore the current through the wire is,  $I = Q / t = 10,000 / 3600 = 2.78 \text{ A}$

The current density in the wire is :  $J = I / A = 2.78 / 50 \times 10^{-6} = 55.6 \times 10^3 \text{ A/m}^2$ .