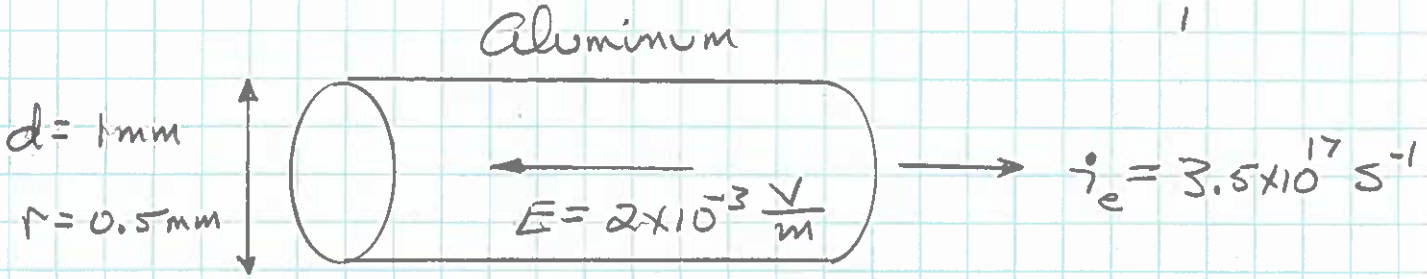

Find the mean time between collisions, τ.

$$i_e = \frac{n_e e \tau A}{m} E$$

So:

$$\tau = \frac{i_e m}{n_e e (\pi r^2) E}$$

For aluminum: $n_e = 18 \times 10^{28}\ m^{-3}$

m = electron mass $= 9.11 \times 10^{-31}\ kg$

Convert everything to MKS.

So: $\tau = 7.046 \times 10^{-15}\ s$