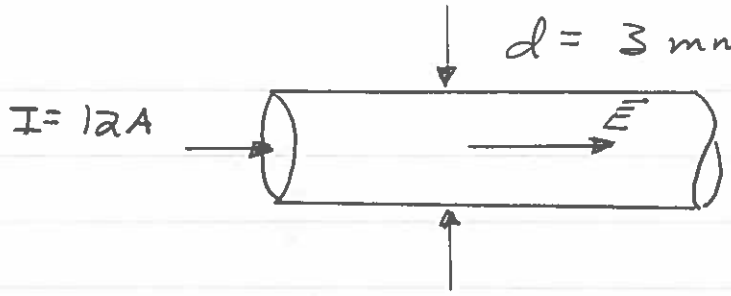

$E = 0.085 \frac{N}{C}$

$J = \sigma E$ and $J = \frac{I}{A}$

So: $\frac{I}{A} = \sigma E$

Or, $\sigma = \frac{I}{AE} = \frac{I}{\pi(\frac{d}{2})^2 E} = 1.997 \times 10^7 \Omega^{-1} m^{-1}$

And $\rho = \frac{1}{\sigma} = 5.007 \times 10^{-8} \Omega m$