

5. (a) For copper, Eq. 42-10 leads to

$$\frac{d\rho}{dT} = [\rho\alpha]_{\text{Cu}} = (2 \times 10^{-8} \Omega \cdot \text{m})(4 \times 10^{-3} \text{ K}^{-1}) = 8 \times 10^{-11} \Omega \cdot \text{m/K} .$$

- (b) For silicon,

$$\frac{d\rho}{dT} = [\rho\alpha]_{\text{Si}} = (3 \times 10^3 \Omega \cdot \text{m})(-70 \times 10^{-3} \text{ K}^{-1}) = -2.1 \times 10^2 \Omega \cdot \text{m/K} .$$