

PHYSICS 1020

Homework #6

(Due April 5, 2010)

1. (Giancoli 18-5) What voltage will produce 0.25 A of current through a 3800- Ω resistor?
2. (Giancoli 18-11) A 12-V battery causes a current of 0.60 A through a resistor. (a) What is its resistance, and (b) how many joules of energy does the battery lose in a minute?
3. (Giancoli 18-13) What is the resistance of a 3.5-m length of copper wire 1.5 mm in diameter?
4. (Giancoli 18-19) A 100-W lightbulb has a resistance of about 12 Ω when cold (20°C) and 140 Ω when on (hot). Estimate the temperature of the filament when hot assuming an average temperature coefficient of resistivity of $\alpha = 0.0060$ ($^{\circ}\text{C}^{-1}$).
5. (Giancoli 18-22) Two aluminum wires have the same resistance. If one has twice the length of the other, what is the ratio of the diameter of the longer wire to the diameter of the shorter wire?