ENGINEERING 2C3 Assignment #1

1. [Serway Chapter 27 Question 8, pg 790]
In the water analogy of an electric circuit, what corresponds to the power supply, resistor, charge, and potential difference?

2. [Serway Chapter 27 Question 18, pg 791]
When incandenscent lamps burn out, they usually do so just after they are switched on. Why?

3. [Serway Chapter 27 Problem 16, pg 792]
Eighteen-gauge wire has a diameter of 1.024 mm. Calculate the resistance of 15.0 m of 18-gauge copper wire at 20.0 °C.

4. [Serway Chapter 27 Problem 17, pg 792]
While traveling through Death Valley on a day when the temperature is 58 °C, Bill Hiker finds that a certain voltage applied to a copper wire produces a current of 1.000 A. Bill then travels to Antarctica and applies the same voltage to the same wire. What current does he register if the temperature is -88 °C? Assume no change in the wire's shape and size.

5. [Serway Chapter 27 Problem 49, pg 794]
Suppose you want to install a heating coil that will convert electric energy to heat at a rate of 300 W for a current of 1.5 A.
(a) Determine the resistance of the coil.
(b) The resistivity of the coil wire is 1.0×10^{-6} Ω·m, and the diameter is 0.30 mm. Determine its length.

6. [Serway Chapter 27 Problem 54, pg 794]
It requires about 10.0 W of power per square foot to heat a room having ceilings 7.5 ft high. At a cost of $0.80 / kWh, how much does it cost per day to use electric heat to a room 10.0 ft x 15.0 ft?