Physics 213 **Quiz 5-2 [20 points]** **Name**_____

1) [10 points] The diameter of a nickel is about 2.14 cm. (For this problem we will pretend the thickness is negligible.) If the nickel is at a temperature of 16^0C, how much power does the nickel radiate, assuming that it is an ideal radiator (emissivity = 1)? (Neglect here the input radiation that the nickel absorbs.) What wavelength is radiated most? If the nickel is sitting in a room also at 16^0C, at what rate does the nickel absorb thermal radiation from the room, i.e., what is the power absorbed?

$P_{radiated}$ =

$\lambda_{radiated}$ =

$P_{absorbed}$ =

2) [10 points] A glass of water is cooled from 40^0C to room temperature (20^0C). How much are the energy, entropy, and free energy (with respect to room temperature) of the water changed during this process? Assume that the heat capacity of the water is C = 4180 J/K.

ΔU =

ΔS =

ΔF =