## Hints for Midterm 1

**#1.** At what wavelength does the maximum in the blackbody spectrum occur if T= 300 K ?

**Sol'n :**

Wien's Displacement Law : $\lambda_{max}.T = 2.90 \times 10^{-3}$ m.K

$$l_{\max} = \frac{2.90x10^{-3}\,m.K}{300K} = 9.67x10^{-6}\,m$$

**#2.** Given that the threshold energy for chromium is 4.40 eV. Calculate the kinetic energy of electrons emitted from a chromium surface that is irradiated with ultraviolet radiation of wavelength 200 nm.

**Sol'n :**

Einstein's Photoelectric Equation : $h\nu = W + KE$

$$W = 4.40eV\left(\frac{1.602\,x10^{-19}\,J}{1eV}\right) = 7.05\,x10^{-19}\,J$$

$$hn = \frac{hc}{l} = \frac{\left(6.626\,x10^{-34}\,J.s\right)\left(2.998\,x10^{8}\,m.s^{-1}\right)}{200\,x10^{-9}\,m} = 9.93x10^{-19}\,J$$

$$KE = hn - W = 9.93x10^{-19}\,J - 7.05\,x10^{-19}\,J = 2.88x10^{-19}\,J$$