Quiz #12
Physics 221

Name: _____

1. Lithium, beryllium and mercury have work functions of 2.30 eV, 3.90 eV and 4.50 eV, respectively. Light with a wavelength of 300 nm is incident on each of these metals.

    a. Which of these metals emit photoelectrons in response to the light? Why?

    b. Find the maximum kinetic energy in eV for the photoelectrons in each case.

2. What is the frequency of a photon that is capable of exciting hydrogen from the n=2 to the n=3 energy level?

3. Why is a population inversion necessary for a laser?

$KE_{max} = hf - E_o$ ‾ $E = hf$ $c = \lambda f$ $E = -13.6 \, eV/n^2$
$\lambda = h/mv$ $h = 6.63 \times 10^{-34} \, Js = 4.14 \times 10^{-15} \, eVs$
$1.6 \times 10^{-19} \, J = 1 \, eV$ $c = 3.00 \times 10^8 \, m/s$