Packet 7A

1. Perform the following unit conversions:

340 nm → m	3.65×10^{-9} m → nm	2500 nm → m
8.56×10^{-7}m → nm	42.0 nm → m	

2. Calculate the frequency of the following waves of electromagnetic radiation.

200 nm	90.0 angstroms	95 cm	5.00×10^{-4} m	35.5 nm

3. Calculate the wavelength of waves with the following frequencies.

4.66×10^{11} 1/s	7.25×10^{8} Hz	2.50×10^{5} s^{-1}
5.22×10^{9} s^{-1}	95 Hz	

4. Calculate the energy of the following photons.

λ = 465 nm	(f) = 6.33×10^{7} s^{-1}	λ = 1.00 m
(f) = 5.55×10^{12} s^{-1}	λ = 25 nm	

5. For the photons described in Questions **1-3** classify the type of radiation.

6. Describe the photoelectric effect in your own words.

7. Copper is bombarded with X-rays of a wavelength of 125 nm. The work function of copper is 4.7 eV (you will have to do a unit conversion), what is the kinetic energy of the electron that is emitted?

8. The kinetic energy of an electron ejected from a niobium surface has a KE = 1.50×10^{-19} J. The surface was bombarded with a photon with a λ = 236 nm, what is the work function of niobium in eV?

9. An electron ejected from a copper surface (use the work function from question 7) with a KE = 2.00×10^{-19} J, what is the wavelength (λ) of the photon that was absorbed by the electron?