38A – Photons

1) Write Einstein's relationship between the energy of a photon and the frequency of the electromagnetic wave that characterizes the photon beam. Explain in words what each term represents.

Relationship	Words

2) What is the approximate frequency, energy, and wavelength of a red light photon like that from the laser in the interference labs?

Wavelength (nm)_____; Frequency(Hz)_____; Energy (Joules):_____Energy (eV):_____

3) A 650 nm laser emits power of 0.001 W. How many photons per second does the laser emit?

_____photons/s

4) Light of wavelength 400 nm is incident on a surface with intensity of 0.50 W/m^2. The wavelength of the light is increased to 700 nm while maintaining the same intensity. Does the flux per area (photons/m^2s) increase, decrease, or remain the same? Explain.

5) When ultraviolet light with a wavelength of 400 nm falls on a certain metal surface, the maximum kinetic energy of the emitted photoelectrons is 1.10 eV. What is the kinetic energy if the wavelength is changed to 350 nm?

6) How many photoelectrons are ejected per second in the experiment represented by the graph?