Chapter 6.1 – 6.4 Additional Practice problems

Section 6.1: The Wave Nature of Light

1. A laser used in eye surgery to fuse detached retinas produces radiation with a frequency of 4.69×10^{14} hz. What is the wavelength of this radiation?

Section 6.2: Quantized Energy and Photons

2. A laser emits light with a frequency of 4.69×10^{14} hz. (a) What is the energy of one quantum of this energy?

(b) The laser emits it's energy in pulses of short duration. If the laser emits 1.3×10^{-2} J of energy during a pulse, how many quanta of energy are emitted during the pulse?

Section 6.3: Bohr's Model of the Hydrogen Atom

3. Calculate the wavelength of light that corresponds to the transition of the electron from n=4 to n=2 state of the hydrogen atom. Is the light absorbed or emitted?

(b) In what portion of the EMS is this light found?

Section 6.4: The Wave Behavior of Matter

4. What is the characteristic wavelength of an electron with a velocity of 5.97×10^{6} m/s.