Chapter 27: Early Quantum Theory

1. Students should understand the photoelectric effect, so they can:

    - Describe a typical photoelectric-effect experiment, and explain what experimental observations provide evidence for the failure of the wave model of light.
    - Describe what is meant by "work function."
    - Describe how Einstein's photon model of light and how it accounts for the experimental observations.
    - Explain why most photoelectrons emerge from the metal surface with less than the maximum possible kinetic energy.
    - Determine the maximum kinetic energy of photoelectrons ejected by photons of one energy or wavelength, when given the maximum kinetic energy of photoelectrons for a different photon energy or wavelength shining on a metal.
    - Sketch or identify a graph of stopping potential versus frequency for a photoelectric-effect experiment, determine from such a graph the threshold frequency and work function, and calculate an approximate value of h/e.