Homework #2

September 14 (to be tested 9/21)

From the text, Chapter 3, problems 7, 25, and 201 (old edition 6, 22, and 107).

Also, the following questions.

1. Determine the orbiting velocity of an electron in the ground state of atomic hydrogen. Express your answer in units of m/s and as a fraction of c, the speed of light.

2. From a standard radio dial, determine the maximum and minimum wavelengths (λ_{max} and λ_{min}) for broadcasts on the
(a) AM band,
(b) FM band.

3. A photon with a wavelength (λ) of 3.091×10^{-7} m strikes an atom of hydrogen. Determine the velocity of an electron ejected from the excited state, $n = 3$.

4. Determine the minimum potential that must be applied to an α-particle so that on interaction with a hydrogen atom, a ground state electron will be excited to $n = 6$.

5. An electron in Li^{2+} falls from $n = 2$ to the ground state. Calculate the wavenumber, $\bar{\nu}$, of the emitted photon.

6. Calculate the wavelength, λ, of a photon capable of exciting an electron in He^{+} from the ground state to $n = 4$.