

Homework #2

September 16 (to be tested September 22)

from Averill, Chapter 6: 46, 51, 54, 55, 57, 67, 71, 73, 78, 86, 93, 98, 101

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 $n = 4$.