QUIZ 2 .....YOUR NAME:_____

Possibly useful formulae:

Doppler Shift: $\frac{\lambda_v - \lambda_0}{\lambda_0} = \frac{\text{velocity}}{c}$; Distance(parsecs)= $\frac{1}{\pi(\prime\prime)}$

Wien's Law: $\lambda_{max} = \frac{2.9 \times 10^6 nm^\circ K}{T}$; Intensity $\propto \frac{1}{(\text{distance})^2}$

1. **Suppose you obtained a spectrum of a distant galaxy, identified the hydrogen emission line with rest wavelength of 4860Å but measured it at 4760Å:**

   a) is the galaxy moving toward or away from us?

   b) what is the galaxy's speed?

2. **What is the trigonometric parallax of a star at a distance of 10 parsecs?**

3. **Suppose you have a hot gas of hydrogen and a hot gas of helium, each at the same temperature. Label the following statements True (T) or False (F).**

   ___The two gases would have identical spectra

   ___Both gases would show identical emission-line spectra

   ___The two gases would show different emission-line spectra

   ___Both would show continuous spectra, with the helium-gas spectrum peaking at a shorter wavelength

4. **For a 2900K object, at what wavelength is the peak of the Planck radiation curve?**

5. **Based on the schematic diagram below of the allowed energy levels in an atom:**

   _____Which transition(s) correspond(s) to the absorption of a photon?

   _____Which transition corresponds to the lowest energy photon emitted?

   _____Which transition corresponds to the shortest wavelength energy photon emitted?

   _____Which transition corresponds to the lowest frequency photon emitted?