ISP 205
Review Questions,Week 3

This is not required homework. It will not be graded. Answers will be supplied next week (in this case, on Monday afternoon, so that you can see the answers before taking the exam).

These questions are intended to help you think about the more important points from my lectures. The exams will ask you about these points, as well as about additional details. But note that the exams will be multiple choice questions.

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1. When I describe light to you as a wave:
    a. What kind of wave is it?
    b. What does it mean when I say that the wave "moves" at the speed of light?
    c. If lightwave #1 has a two times bigger wavelength than lightwave #2, is the frequency of lightwave #1 larger or smaller than the frequency of lightwave #2? By how many times?
2. In the particle description of light, how would the energies of photons #1 and #2 compare?
3. Arrange the following "types" of light into their order of increasing wavelength:
   infra-red, x-rays, visible, radio, gamma-rays, ultra-violet, microwaves.
4. Why do atoms absorb and emit light only at some wavelengths, but not at other wavelengths?
5. How can we determine the chemical composition of a distant star or gas cloud?
6. As a source of thermal radiation gets hotter,
    a. How does the average energy of the photons that it emits change?
    b. How does that affect the average wavelength of the photons?
    c. Does that cause the color of the thermal emitter to appear bluer, redder, or stay the same?
    d. How does the total amount of energy emitted per unit surface area change?
7. What property of a distant star can be measured just be just looking at the color of the star as it shines up in the sky?
8. How can an absorption line be used to measure the line-of-sight velocity of a distant star?

And from the lecture on Monday Jan 30, if I get to these topics:

9. What are two key reasons for launching telescopes into space?
10. What are two general reasons for making telescopes larger??