

OPTI380A

Prelab Questions – Lab 10 2009

All pre lab questions must be submitted at the beginning of each laboratory session. They are designed to prepare you for the lab so that you can finish the lab on-time. You will receive zero credit for the pre lab questions, if you come to the lab without answering the pre lab questions.

Prelab questions:

- (1) Describe how you can measure the wavelength of a laser using a Michelson interferometer.
- (2) The sodium spectrum is dominated by the bright doublet known as the Sodium D-lines at 588.9950 and 589.5924 nanometers. From the energy level diagram it can be seen that these lines are emitted in a transition from the 3p to the 3s levels. Plot I_{tot} as a function of d using equations (10-8) and (10-9). Is (10-9) a good approximation of (10-8)? (Hint: plot the difference of (10-8) and (10-9) and see how big it is.)
- (3) How does the refractive index of air change with temperature? What is the index of “standard air” at room temperature ($T = 25\text{C}$) and pressure (101.325 kPa) for wavelength of 630 nm? (Use Index of refraction of air handout).

