

OPTI380A

Prelab Questions – Lab 13 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. Post lab questions must be handed in class at the beginning of each lecture after the completion of the lab.

- (1) A grating is a periodic structure that separates light of different wavelengths both temporally and spatially. What is the fundamental diffraction grating equation? What are the meanings of all the variables?
- (2) If a grating has a groove spacing of 300 lines per inch, what are the diffraction angles for the $m = 1, 2, 3$ orders with $\lambda = 632\text{nm}$ for a normally incident laser beam? For the same grating, what are the diffraction angles for $\lambda = 633\text{nm}$? If the laser has two wavelengths, one at 632nm and one at 633nm, which order has the largest angular separation of the two wavelengths? What is this angular separation?