OPTI380A

Prelab Questions – Lab 11 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) What does LASER stand for? What are the differences between light coming from a light bulb and light coming out of a laser?
(2) The conventional laser is made up of a gain medium inside an optical cavity. The cavity can support an infinite number of longitudinal and traverse modes. Each mode is characterized by a wavelength and a polarization. What is the lowest order mode of the HeNe laser in this lab? Draw a picture of the output intensity profile of the lowest order mode. The lowest order mode is not necessary the lasing mode of the laser. What determines which mode or modes the laser will emit?
(3) For a laser with mirror curvatures, r = 100cm and L = 20 cm. What is the frequency separation between the TE_{001} and TE_{002} modes? What is the frequency separation between the TE_{01q} and TE_{02q} modes?