

STUDY GUIDE 4

Readings:

- Chapter 19      Section 19-2. Here the expressions for gain coefficient due to stimulated emission are used to obtain the total gain of an optical amplifier. The importance of gain saturation is emphasized.
- Chapter 20      All. The idea of lasing threshold is introduced, and the rate equation approach is used to describe the input vs. output characteristics of a laser. A key concept is the slope efficiency, which relates the incremental change in output power to the incremental change in input power.

Homework #4 (due Nov. 30):

Problems from text

1. 19-4
2. 19-5 (Hint: part b can be solved both graphically and analytically -- try both ways and see how they compare)
3. 19-6
4. 20-1
5. 20-3
6. 20-4 (assume the rod fills most of the space between the mirrors)
7. 20-7 (assume attenuation of light in the fiber is negligible)
8. 20-8 (assume the gain medium fills most of the space between the mirrors)