

Homework #9 (due Nov. 4)

Each problem is 10 points

Textbook problem 10.8

Problem A1: A pair of crossed polarizers, with axes at angle 0° and 90° is placed in a beam of unpolarized light of intensity I_0 . A quarter-wave plate is then placed between the two polarizers. What is the maximum and minimum intensity detected after the second polarizer?

Problem A2: Fig. 10.20 displays the schematics of an optical isolator. Explain in your own words its operation principle. If each polarizer's extinction ratio is 10^{-3} , what is the maximum fraction of the linearly polarized light will be transmitted through an optical isolator in the backward direction?

Textbook problem 10.7

Problem A3: Fig. 10.16 displays the schematic for a CD/DVD reader. Explain it in your own words. Then explain why decreasing the wavelength of a laser from infrared 850nm in CD players, to red 650nm in DVD players to violet 405nm in blue-ray players led to dramatic increase of the storage capacity in a disk.