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PH2501 -- Photonics
term B, 2018
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Study Guide 1

Week 1 10/23 - 10/26	Homework due 10/29 (Mon)

READINGS: Quimby, Chapters 1 and 2

PROBLEMS: Ch. 2: problems 3, 4, 7, 8, 11
Also, the following problems:

SP#1 Two 1-km fibers are spliced together. Each fiber has a 5-dB loss and the splice adds 1 dB of loss. If the power entering is 2 mW, then how much power is delivered to the end of this combined transmission line?

SP#2 How many photons are arriving per second at a receiver if the power is 1 nW at wavelength 1.3 μm?

SP#3 Compute the divergence angle of a laser beam of wavelength 800 nm and Gaussian beam radius 1 mm. If this beam is aimed at the moon, what is the diameter of the spot on the moon's surface? Consider the diameter to be twice the Gaussian beam radius. (The distance between the earth and the moon is 3.8×10^8 m.)

SP#4 Compute the reflectance at an $Al_{0.3}Ga_{0.7}As$-to-air boundary (at normal incidence). Also compute the transmission loss in decibels. Repeat for a $GaAs/Al_{0.3}Ga_{0.7}As$ boundary. [See Table 2-1 for refractive index data]