Name:

Physics 51
Homework #19
November 17, 2016

# 41-E23, SUP4

**41-E23** A disabled tanker leaks kerosene ($n = 1.20$) into the Persian Gulf, creating a large slick on top of the water ($n = 1.33$).

(a) If you are looking straight down from an airplane onto a region of the slick where its thickness is 460 nm, for which wavelength(s) of visible light is the reflection the greatest?

(b) If you are scuba diving directly under this same region of the slick, for which wavelength(s) of visible light is the transmitted intensity the strongest?

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**SUP4** Light traveling in air ($n_1 = 1$) enters the smooth, flat surface of a pond ($n_2 = 1.33$) at normal incidence.

(a) What fraction of the light is reflected and what fraction is transmitted?

(b) If the maximum amplitude of the electric field in the incident light is $E_0$ ,what is the maximum amplitude of the electric field in the reflected light?

(c) When you see scenery reflected in a still pond or lake, how is that situation different from the one you have just calculated?

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