Assignment 2: ECE545, Monsoon 2020

November 13, 2020

Total marks: 20. Deadline: 6 p.m., Nov. 24, 2020

Plagiarism policy: ZERO tolerance towards copying assignments from others/ plagiarism from any other sources. Such cases will be dealt strictly according to the institute policy.

Late submission policy: −5/day after the submission deadline (starts immediately after 6 p.m. Nov. 24, NO exceptions).

Q1. Using Fermat's principle prove that angle of incidence is equal to angle of reflection on a planar surface.
10 points

Q2. Consider a set of parallel slabs with refractive indices $n_1, n_2, ..., n_N$ of thicknesses $d_1, d_2, ..., d_N$ placed in air, normal to z-axis. Show that the ray-transfer matrix of this system is:

$$M = \begin{bmatrix} 1 & \sum_{i=1}^{N} \frac{d_i}{n_i} \\ 0 & 1 \end{bmatrix}$$

10 points