Problem 5.13

At $f = 1/2T_s$, which corresponds to the highest frequency component of the message signal for a sampling rate equal to the Nyquist rate, we find from Eq. (5.17) that the amplitude response of the equalizer normalized to that at zero frequency is defined by

$$\frac{1}{\mathrm{sinc}(0.5T/T_s)} = \frac{(\pi/2)(T/T_s)}{\sin[(\pi/2)(T/T_s)]} \tag{1}$$

where the ratio T/T_s is equal to the duty cycle. In Fig. 1, Eq. (1) is plotted as a function of T/T_s. Ideally, the graph should be equal to one for all values of T/T_s, as indicated by the dashed horizontal line in Fig. 1. For a duty cycle of 25 percent, it is approximately equal to 1.04, which exceeds the ideal case by about 4%.

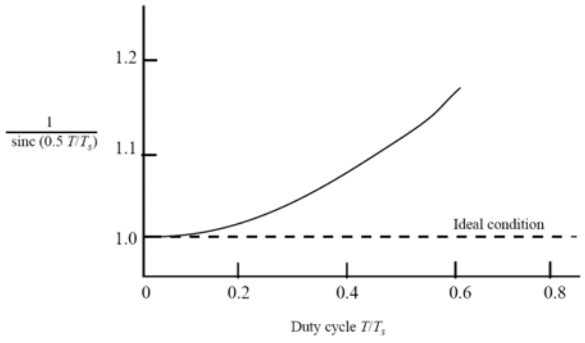

Figure 1