PROBLEM:

A proposed D-to-C converter takes a sequence $y[n]$ as input and produces a continuous-time output $y(t)$ according to the relation

$$y(t) = \sum_{n=-\infty}^{\infty} y[n]p(t - nT_s)$$

where $T_s = 10^{-3}$ sec. The input sequence is given by the formula

$$y[n] = \begin{cases} \frac{1}{5}(n+1) & 0 \le n \le 4 \\ (0.5)^{n-4} & 5 \le n \le 9 \\ 0 & \text{otherwise} \end{cases}$$

(a) Plot $y[n]$ versus n.

(b) For the pulse shape

$$p(t) = \begin{cases} 1 & -0.5 \times 10^{-3} \le t \le 0.5 \times 10^{-3} \\ 0 & \text{otherwise} \end{cases}$$

plot the output waveform $y(t)$ over its non-zero region.

(c) For the pulse shape

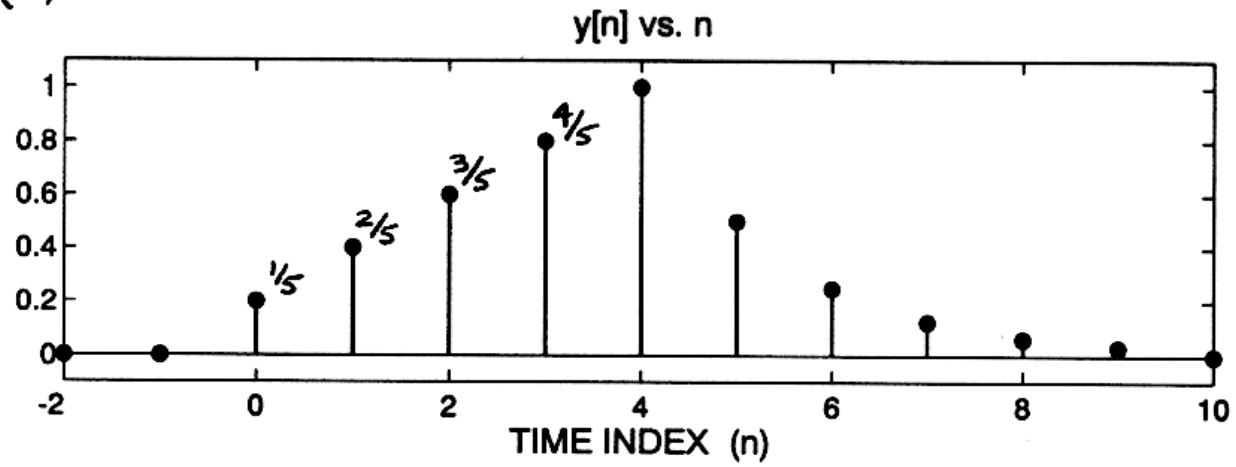
$$p(t) = \begin{cases} 1 - 1000|t| & -10^{-3} \le t \le 10^{-3} \\ 0 & \text{otherwise} \end{cases}$$

plot the output waveform $y(t)$ over its non-zero region.

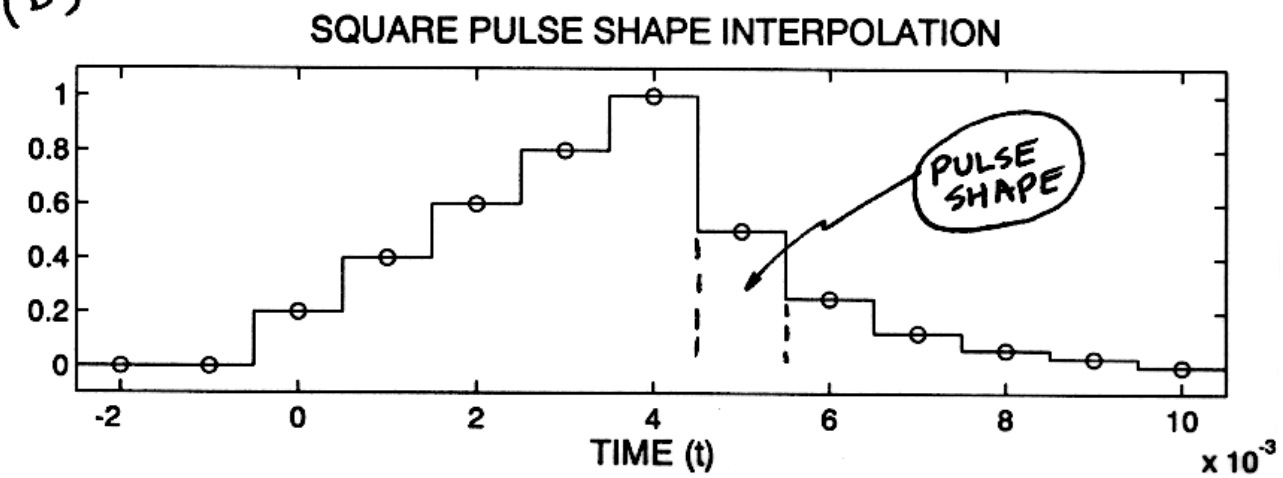
McClellan, Schafer and Yoder, *Signal Processing First*, ISBN 0-13-065562-7.
Prentice Hall, Upper Saddle River, NJ 07458.

SOLUTION

(a)



(b)



(c)