

**PROBLEM:**

A non-ideal 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  $T_s = 0.1$  second. The input sequence is given by the formula

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

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

(b) For the pulse shape

$$p(t) = \begin{cases} 1 & -0.05 \leq t \leq 0.05 \\ 0 & \text{otherwise} \end{cases}$$

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

(c) For the pulse shape

$$p(t) = \begin{cases} 1 - 10|t| & -0.1 \leq t \leq 0.1 \\ 0 & \text{otherwise} \end{cases}$$

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