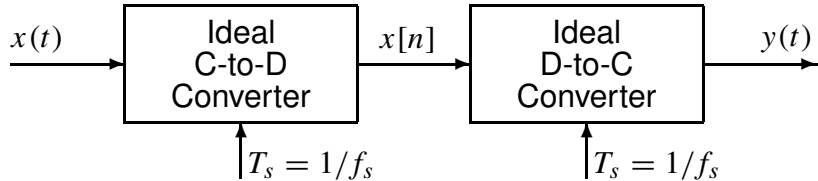


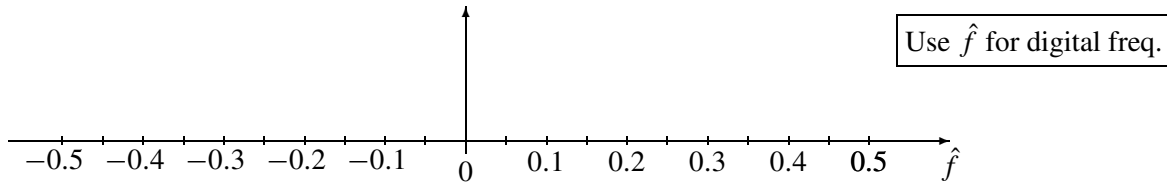
PROBLEM:

Suppose that the continuous-time input $x(t)$ to the above system is given as

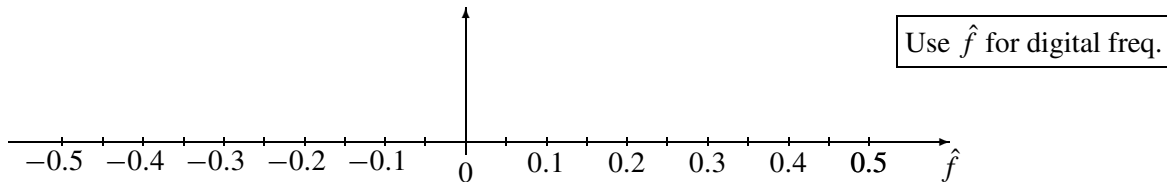
$$x(t) = \cos(16000\pi t) + \cos(9000\pi t) + \cos(7000\pi t) + \cos(4000\pi t) + \cos(1000\pi t)$$

(a) What is required such that no aliasing occurs for $x(t)$?

(b) Given that $f_s = 10000$ samples/second, the frequency spectrum for $x[n]$.



(c) Given that $f_s = 3000$ samples/second, the frequency spectrum for $x[n]$.



(d) Given that $x(t) = \cos(26000\pi t + \pi/3) + \cos(16000\pi t + \pi/3) + \cos(4000\pi t - \pi/3)$ and $f_s = 10000$ samples/second, write a simplified expression for the in terms of cosine functions.