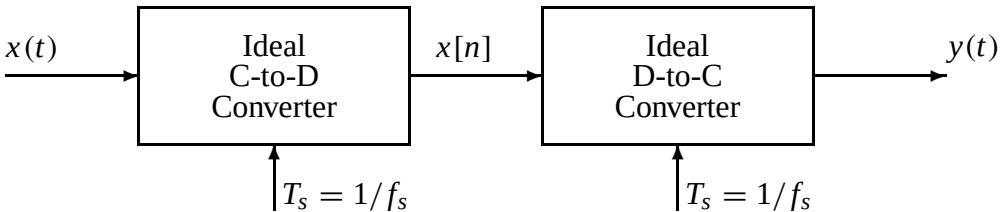
PROBLEM:

Consider the following system.



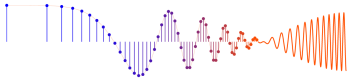
If $x(t)$ is given by the formula

$$x(t) = 21 + 10\cos(2200\pi t + \pi/2) - 5\cos(5500\pi t - \pi/4),$$

what condition must be satisfied by the sampling rate, $f_s = 1/T_s$, such that $y(t) = x(t)$?

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

SOLUTION



$x(t)$ has freqs: 0, 1100Hz & 2750 Hz.

Sampling Thm: f_s must be greater than 2 x Highest

$\therefore f_s > 2(2750) = 5500$ samples/sec.