

PROBLEM:

The input to the C-to-D converter in the figure below is

$$x(t) = 3 + 2 \cos(6000\pi t - \pi/4) + 11 \cos(12000\pi t - \pi/3)$$

The frequency response for the digital filter (LTI system) is

$$\mathcal{H}(\hat{\omega}) = \frac{\sin(5\hat{\omega})}{\sin(\frac{1}{2}\hat{\omega})} e^{-j5\hat{\omega}}$$

If $f_s = 10000$ samples/second, determine an expression for $y(t)$, the output of the D-to-C converter.

