

## PROBLEM:

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

$$x(t) = 3 + 4 \cos(3000\pi t + \pi/2) + 12 \cos(20000\pi t - 2\pi/3)$$

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

$$\mathcal{H}(\hat{\omega}) = \frac{\sin(4.5\hat{\omega})}{\sin(\frac{1}{2}\hat{\omega})} e^{-j4\hat{\omega}}$$

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

