PROBLEM:

Circle the correct answer to each of these short answer questions:

1. If the impulse response of an FIR filter is defined with a scaling parameter β

$$h[n] = \beta(2\delta[n] - \delta[n-1] + 2\delta[n-2])$$

Determine β so that the DC value of the frequency response $H(e^{j\hat{\omega}})$ will be equal to one.

(a) $\beta = 1/3$

(b) $\beta = 1/4$

(c) $\beta = 1/5$

(d) $\beta = 1/2$

(e) $\beta = 1$

2. For the following MATLAB code: `yy = firfilt( [1,0,0,0,-5], xx )`
pick the correct difference equation for the filter being implemented.

(a) $y[n] = \delta[n] - 5\delta[n-1]$

(b) $y[n] = \delta[n] - 5\delta[n-4]$

(c) $y[n] = x[n] - 5x[n-4]$

(d) $y[n] = x[n-4]$

(e) $y[n] = x[n] - 5x[n-1]$

3. The MATLAB statement: `xx = [ cos(0.13*pi*(0:2000)), cos(0.17*pi*(0:2000)) ];`,

(a) Defines `xx` as the concatenation of two sinusoids played in succession.

(b) Defines `xx` as the sum of two sinusoids played simultaneously.

(c) Defines `xx` as a frequency response.

(d) Defines `xx` as a spectrogram.

4. If a filter is defined by the MATLAB operation: `yy = firfilt(0.2*ones(1,5),xx)`, then the filter is:

(a) a highpass IIR filter.

(b) a lowpass IIR filter.

(c) a highpass FIR filter.

(d) a lowpass FIR filter.

(e) an allpass filter, i.e., its frequency response magnitude is constant.