ECE 212 Lab Experiments #2

Preparation:

1) \( x[n] = \begin{cases} 1 & n = 1, 2 \\ -1 & n = -1, -2 \\ 0 & n = 0 \text{ and } |n| > 2 \end{cases} \) is given

Draw the graph of the following waveforms

- a) \( x[n] \)
- b) \( 2x[n] \)
- c) \( x[n]+2 \)
- d) \( x[n]-1 \)
- e) \( x[n-1] \)
- f) \( x[n-2] \)
- g) \( x[n+2] \)
- h) \( x[2n+1] \)
- i) \( x[-3n-4] \)
- j) \( x[-2n-1] \)

2) Consider the following sinusoidal signals, determine whether they are periodic or not. If they are periodic find the fundamental period.

- \( x[n]=5\sin[2n] \)
- \( x[n]=5\cos[0.2\pi n] \)
- \( x[n]=5\cos[6\pi n] \)
- \( x[n]=5\sin[6\pi n/35] \)

3) Please draw the following waveforms.

- a) \( x[n]=u[n]-u[n-10] \)
- b) \( y[n]=u[n-5]-u[n-23] \)
- c) \( v[n]=\delta[n-1] \)
- d) \( k[n]=\delta[n-2]+\delta[n-8]+\delta[n+2]-2\delta[n+3] \)
- e) \( m[n]=x[n].y[n] \)

4) Draw the following waveform.

- \( x[n]=u[n]-u[n-10]+r[n-10]-r[n-20]+\delta[n-6]+4\delta[n+1]+\delta[n-23] \)
- \( r[n] \) is the ramp function

Experimental Part:

Write program segments that are necessary to draw the waveforms in preparation part 1,2,3,4. For part 2 draw the sinusoidal waveforms and looking at the waveform decide whether it is periodic or not. Does it match with your theoretical decision?

Note: You may use any vector length while doing part 2

Report: Clearly explain the necessary how to plot a shifted, scaled, reflected discrete time signal. And also criticize whether the matlab graphs matches with those you draw with pencil.

Good Luck
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