Computer Assignment - 01 - Spring 2019

Signals & Systems
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1 Signal Transformations

- Given $u]n]$ the unit step sequence,using the stem function plot the following
  - $u[n-5]-u[n-10]$
  - $u[6-n]-u[3-n]$
  - $u[8-n]$
- Given the signal $sin[\omega_0 n]$, plot the following: Assume the unknown values
  - $cos[\omega_0(n-n_0)]$
  - $cos[\omega_0(n+n_0]$
- Given the signal $x(t)$

$$x(t) = \begin{array}{ll} 0 & t<0 \\ 2t & 0\leq t<1 \\ 3-t & 1\leq t<3 \\ t-3 & 3\leq t<5 \\ 2 & 5\leq t<7 \\ 0 & t\geq 7 \end{array} \quad (1)$$

  - Plot the following
    - $x(t-2)$
    - $x(t+3)$
    - $x(3t-4)$
    - $x(1-3t)$

- Given the discrete signal,

$$x[n] = [\underset{\uparrow}{-1}, \ -2, \ -3, \ 4, \ -2] \tag{2}$$

  plot the following transformations

  - $x[n+1]$
  - $x[n-2]$
  - $x[3-n]$
  - $x[3-2n]$
  - $x[4n+5]$

2 Signal Generation

Consider the signal

$$x(t) = \begin{cases} e^{2t} & -1 < t < 0 \\ e^{-2t} & 0 < t < 1 \\ 0 & otherwise \end{cases}$$

Answer/do the following

- Plot $x(t)$
- Define $y(t)$ as a periodic signal equal to $x(t)$ in the fundamental period $T = 3$.

  Plot $y(t)$. Assume the number of pulses to be plotted as 5.

3 Instructions and grading scheme

Merge all the sections into a single pdf file and upload.

- Section 1: Matlab code and results (Max Grade: 6 points)
- Section 2: Matlab code and results for signal transformations (Max Grade: 4 points)