ECE 218 Signals and Systems Laboratory 1

I. Experimental Work

1) A cont. time $x(t)$ signal is given. Plot $x(t)$ versus $t = 0 : 0.01 : 5$. $x(t) = 10e^{-t} - 5e^{-0.5t}$

2) Repeat part (1) for $x(t) = 10e^{-t} + 5e^{-0.5t}$
3) An exponentially damped sinusoidal signal is defined by $x(t) = 20sin(2\pi \times 1000t - \pi/3)(e^{-at})$ where the exponential parameter a is variable, taking on the set of values a=250, 500, 750, 1000. For each a value draw $x(t)$ signal for $-2 \leq t \leq 2$ miliseconds. Observe the effects of a on the signal. Using subplot command plot $x(t)$ signals for all a values on the same graph.
4) A rectangular pulse is defined by

$$x(t) = \begin{cases} 10 & \text{if } 1 \leq t \leq 10 \\ 0 & \text{Otherwise} \end{cases}$$

   Write an matlab file to generate $x(t)$ signal.
5) A discrete time signal is given as

$$y[n] = \begin{cases} cos(2\pi Fn) & \text{if } -1/(2F) \leq t \leq 1/(2F) \\ 0 & \text{Otherwise} \end{cases}$$

   F=0.1, plow y[n] signal versus [n]
6) draw the following signals using matlab

$$x(t) = \delta(t-2), y[n] = \delta[n-5]$$

7) A continuous time signal is defined as,

$$x(t) = \begin{cases} -t+1 & \text{if } -1 \leq t \leq 0 \\ t+1 & \text{if } 0 \leq t \leq 1 \\ 0 & \text{Otherwise} \end{cases}$$

   Write an matlab function to generate $x(t)$ signal. Using your function draw the following signals $x(t-5)$, $x(t+5)$, $x(2t-4)$, $-2x(-2t+5)$. Take your time interval as $-8 \leq t \leq 8$.
8) Good Luck

Note: Use *plot* command to draw the continuous time signals. Use *stem* command to draw discrete time signals. LaTeX

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