

# ECE 218 Signals and Systems Laboratory 2

## 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  $x(t) = 20\sin(2\pi \times 1000t - \pi/3)(e^{-at})$  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  $-2 \leq t \leq 2$  milliseconds. 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.  $\LaTeX$