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

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

\( F=0.1 \), plot \( y[n] \) 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.