Lab – 2

Subject Code: EC303 P

Due Date: Aug 21st, 2020

Instructions:

1. Please mention legends, axis labels, titles etc in your plot/subplot for better understanding & clarity.
2. The report to be submitted must include matlab code & all observations pertaining to each plot below the same.
3. Kindly number your answers correctly.
4. **NO PLAGIARISM.**
5. Ask any questions in class or via LMS so that it will be beneficial to all (us and you).

Questions:

1. Generation of signal and its transformation.

a) Write a Matlab function signalx that evaluates the following signal at an arbitrary set of points:

$$x(t) = \begin{cases} 0; -\infty < t \le -2 \\ 2; -2 < t \le 0 \\ 2e^{-t/2}; 0 < t \le \infty \end{cases}$$

b) Plot the signal x(t) versus t, for $-8 \le t \le 8$. Consider enough no. of closely spaced sample points to get a smooth plot.

c) Use the function signalx to plot x(t-3) versus t.

d) Use the function signalx to plot x(3-t) versus t.

e) Use the function signalx to plot x(2t) versus t.

f) Use the function signalx to plot x(t/2) versus t.

2. Convolution of two continuous-time signals

a) Write a Matlab function contconv that computes an approximation to continuous-time convolution for the following signals:

$$x_1(t) = \begin{cases} 1; 0 < t \le 2 \\ 0; elsewhere \end{cases} \quad \text{and} \quad x_2(t) = \begin{cases} 1; 0 < t \le 3 \\ 0; elsewhere \end{cases}$$

b) Plot all the three signals $x_1(t)$, $x_2(t)$ and convolved output signal y(t) in the same plot using subplots.

c) Also verify your output plot using in -built matlab command ‘conv’. Plot the convolved output obtained in part (b) & (c) i.e. with & without using in -built matlab command ‘conv’ in the same plot using subplots.

d) Convolve the signal $x_1(t)$ with itself to obtain output signal z(t). Plot the two signals $x_1(t)$ and z(t) in the same plot using subplots.