LAB SESSION 2

GENERATION OF SIGNALS USING MATLAB

OBJECTIVE

To generate signals using MATLAB and visualize the characteristics of signals by changing parameters

REQUIREMENTS

> ➢ Intel based computer
> ➢ MATLAB

THEORY

The MATLAB signal processing toolbox has a large variety of functions for generating signals, most of which require that we begin with a vector representation of time t to n. To generate a vector t of time values with a sampling interval t of 1 ms on the interval from 0 to 1s, for example, we use the command: T = 0: .001:1;

PROCEDURE

Generating sinusoidal waveforms

Consider first the generation of a square wave of amplitude A, fundamental frequency w0 {measured in radians per second), and duty cycle (d). That is, rho is the fraction of each period for which the signal is positive. To generate such a signal, we use the basic command:

Matlab Code :

t = 0:0.001:0.3;

y = square(2*pi*10*t);

figure(1)

plot (t,y)

title('Square Wave With 10 Hz Frequency')

Square Wave With 10 Hz Frequency and 20 Percent Duty Cycle
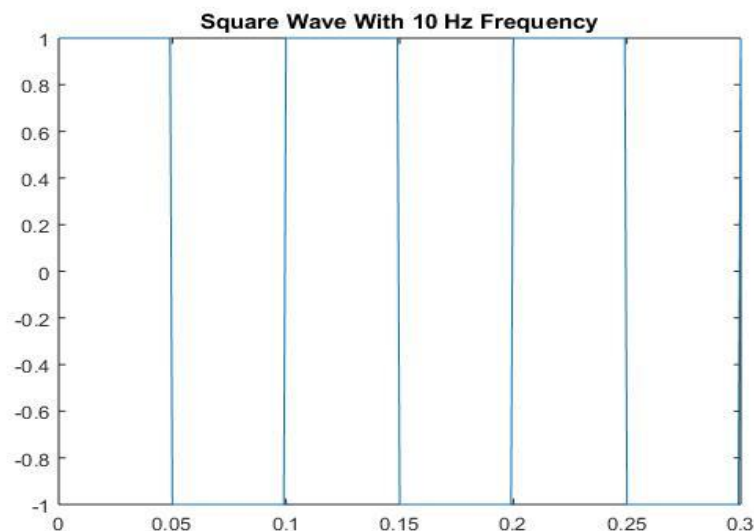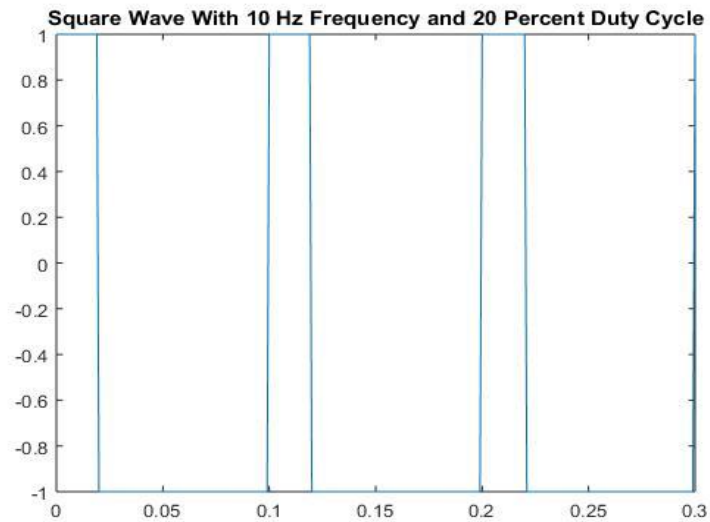
y = square(2*pi*10*t, 20); % with 20 percent Duty cycle

Generating sinusoidal waveforms

close all

clear all

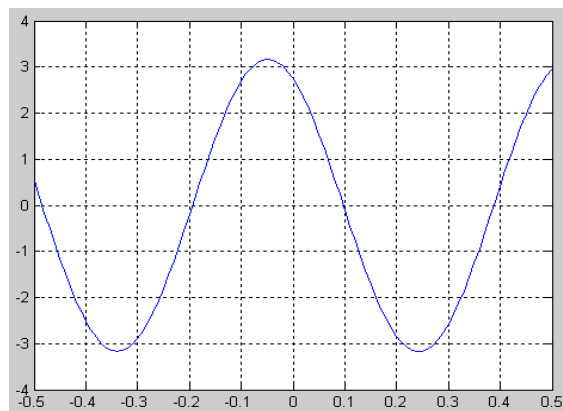 % generating sinusoidal waveform for continuous time

 w0 = 10.8   % rad/sec

t = -0.5:0.01:0.5;

f = 3.17*cos(w0*t+pi/6);

figure(1)

plot (t,f)

grid

%to change the amplitude to a convergent form

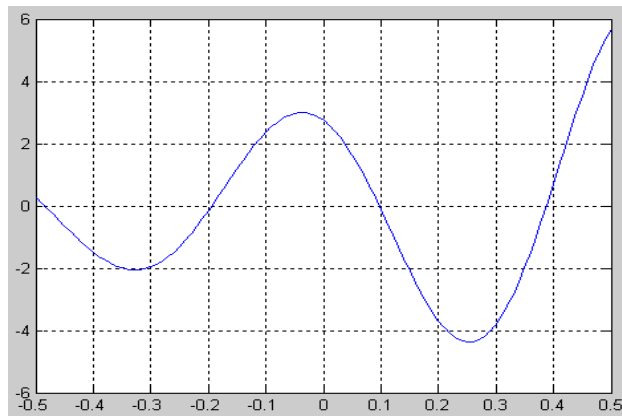W0 = 10.8   % rad/sec

t = -0.5:0.01:0.5;

f = 3.17*exp(1.3*t).*cos(W0*t+pi/6);

figure(2)

plot (t,f)

grid

LAB WORK

Task 1

$$f = \sin 20t\, e^{-t}$$

For the function $f(t)$, write the MATLAB code to plot $f(t)$ and place the plot in Figure 2.1

Figure 2.1

COMMENTS & DISCUSSION

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