Experiment No: 03

Experiment Name: Plotting Various signals on Matlab

Objective: To write programs that can plot several signals.

Software Requirement: Matlab

Theory: Any signal can be plotted on matlab. Matlab can plot continuous time and discrete time signal. In this experiment some basic signals will analyzed.

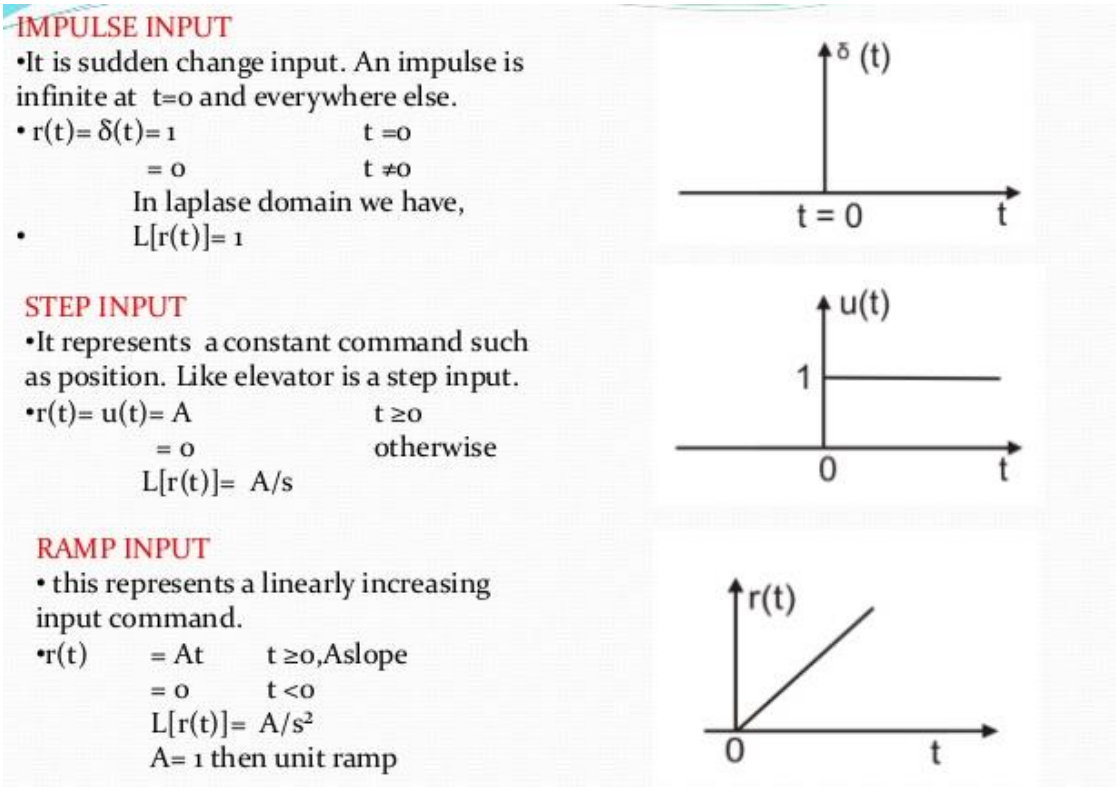

Fig 1: Unit step, impulse and ramp signal

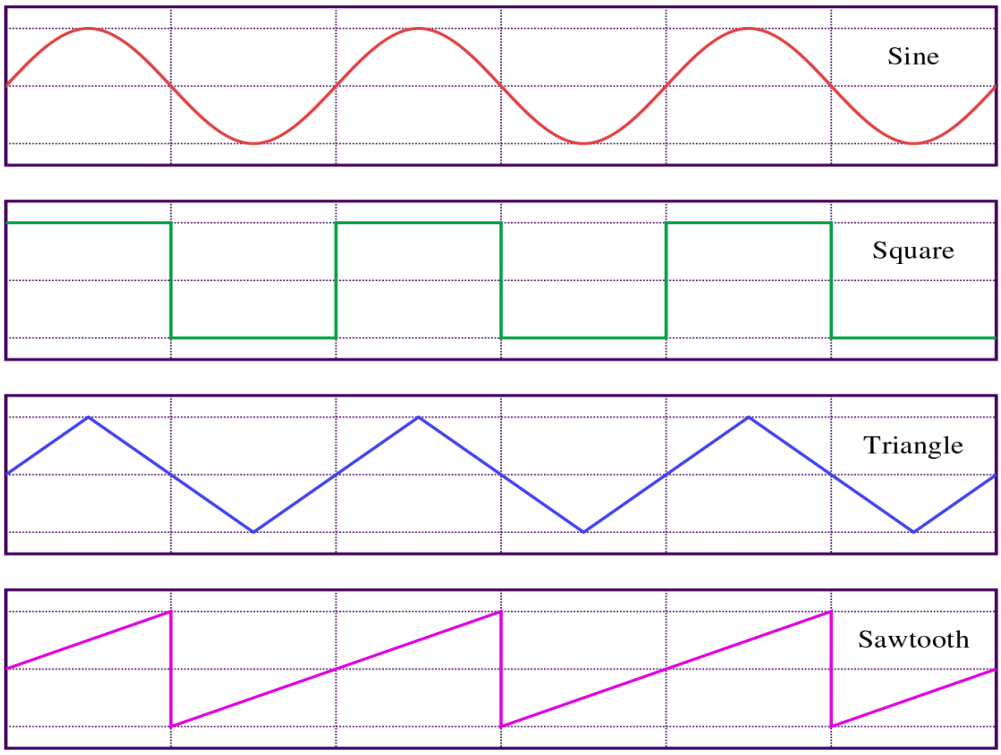

Fig: Some periodic waveform

Matlab Program & Diagrams:

For Unit Step Function:

```
>> t=-10:0.01:10;          % step is small enough to represent continuous-time signal
>> f=heaviside(t);         % the unit step function.
>> plot(t,f)               % plotting unit step function
```

Diagram:

For Ramp Signal:

```
>> t = -10:0.001:10;
>> ramp = t;
>> plot(t,ramp)
```

Diagram:

For Sine Wave:

```
% plotting sine wave
t = 0:0.00001:1;
f = 1;
w = 2*pi*f;
x = 2*sin(w*t);
plot(t,x);
```

Diagram:

For square wave:

```
t = 0:0.001:20;
A = 3;              % amplitude
T = 2;              % period
w =( 2*3.14)/T;  % angular frequency
x = square(w*t);
axis([0 10 -2 2]); % changing the axis
```

Diagram:

For sawtooth wave:

```
t = 0:0.001:20; t = 0:0.001:20;
A = 3;              % amplitude
T = 2;              % period
w =( 2*3.14)/T;  % angular frequency
x = square(w*t);


A = 3; % amplitude
T = 2; % period
w =( 2*3.14)/T; % angular frequency
x =A*sawtooth(w*t);
plot(t,x);
axis([0 10 -4 4]); % changing the axis
```

Discussion :

In this lab, I practiced implementing essential signal functions in MATLAB. Explored functions like unit step, ramp, sine, square, and sawtooth waves, adjusting parameters for varied visualizations. This hands-on experience enhances my MATLAB skills and provides practical insights into signal processing concepts, applicable across disciplines.