EXPERIMENT NO. 2

OBJECT:-

i) Plot the basic signals (Impulse, Step function and Ramp function)
ii) To create 2-D and 3-D plots.

SOFTWARE USED:- MATLAB 7.9

PROCEDURE:-

- Open MATLAB
- Open new M-file
- Type the program
- Save in current directory
- Compile and Run the program
- For the output see command window\ Figure window

THEORY:-

a) Impulse Function

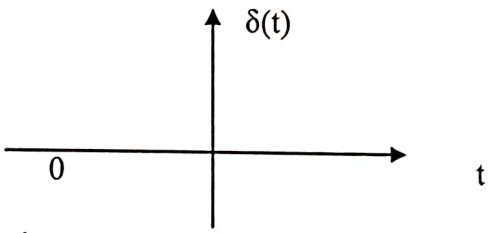
The impulse function is defined as

$\int_{-\infty}^{\infty} \delta(t)dt = 1$

and

$\delta(t = 0 \text{ for } t \neq 0)$

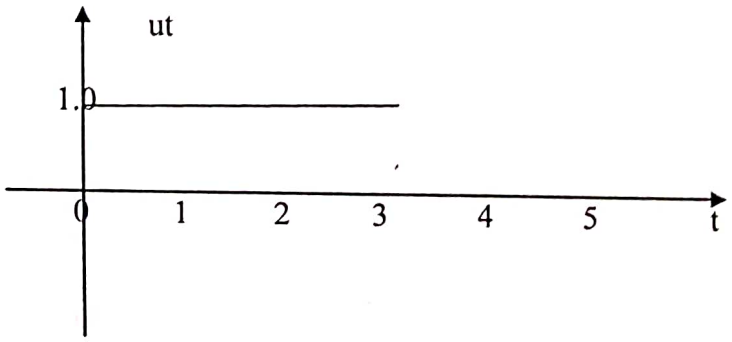
That is the impulse function has zero amplitude everywhere expect at t = 0.



b) Step Function

The unit step function is defined as

U(t) = 1 for t ≥ 0
= 0 for t > 0



Program:

```
t=(-2:0.01:10);
impulse = t==0;
unitstep = t>=0;
plot(t, impulse)
plot(t, unitstep)
ramp = t.*unitstep;
plot(t,ramp)
xlabel('Time')
ylabel('Amplitude')
title('impulse function')
title('unit step function')
title('ramp function')
```

c) 2-D plot

Define x as a vector of linearly spaced values between 0 and 2π. Use an increment of $\pi/10$ between the values. Define y as sine values of x.

Program:

```
clc
clear all
x=(0:pi/10:2*pi)
y=sin(x)
plot(x,y)
title('2D Plot')
xlabel('Time')
ylabel('Amplitude')
```

d) 3-D plot

A three-dimensional plot may refer to

a) A graph or plot embedded into a three-dimensional space

b) The plot of a function of two variables, embedded into a three-dimensional space

Program:

```
clc
clear all
t=(-4:0.01:4)
x=t.^2
y=4*t
plot3(x,y,t)
grid on
xlabel('x-axis')
ylabel('y-axis')
zlabel('z-axis')
title('3D Plot')
```

RESULTS:

Results have been seen on the command window.

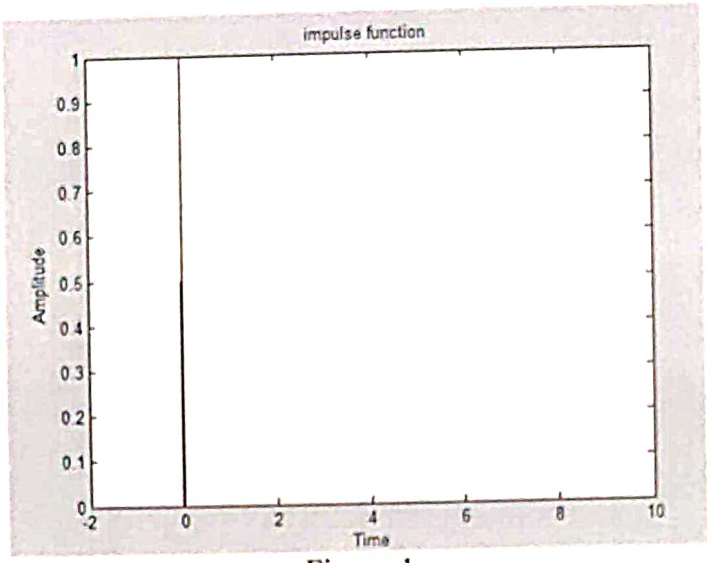


Figure-1

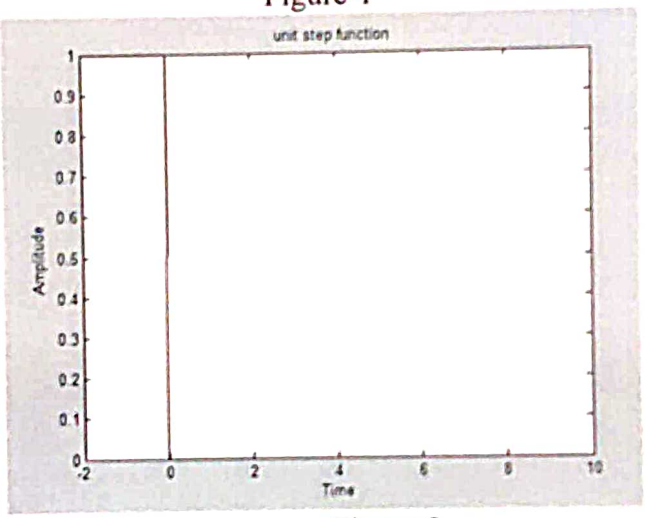


Figure-2

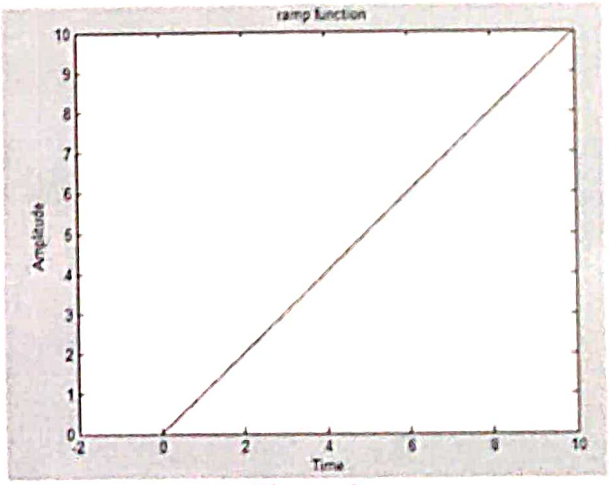


Figure-3

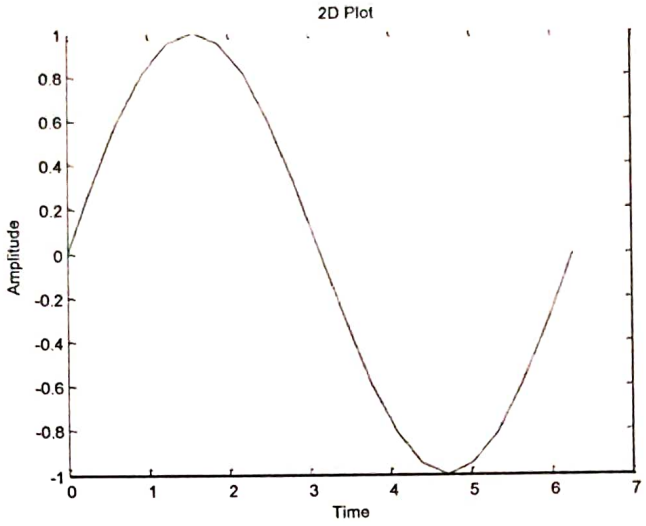


Figure-4

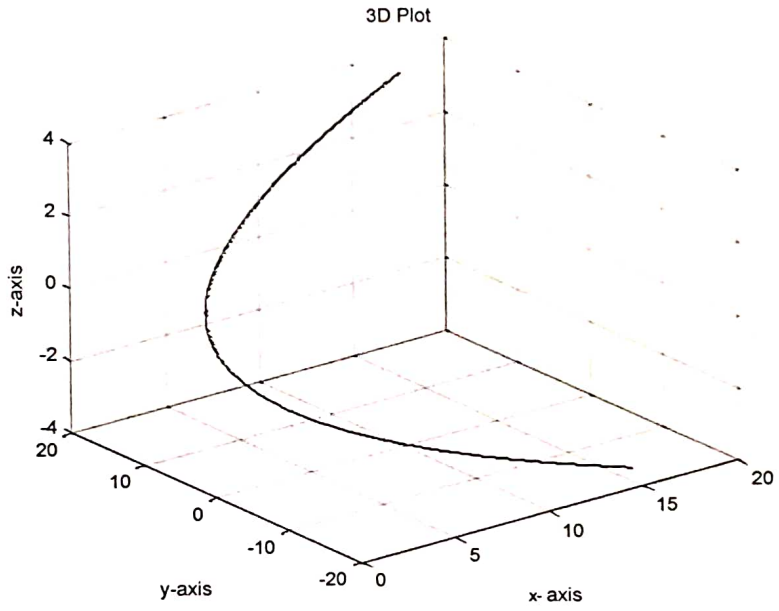


Figure-5

PRECAUTIONS:-

1) Program must be written carefully to avoid errors.

2) Programs can never be saved as standard function name.

3) Functions in MATLAB are case sensitive so commands must be written in proper format.