# MATLAB PROGRAM:

```
clc;
clear all;
close all;
n=20;
fp=200;
fs=600;
f=1000;
wp=2*(fp/f)
ws=2*(fs/f)
wn=[wp,ws]
%window=boxcar(n+1); % rectangular window
%window=bartlett(n+1);% traiangular window
%window=hamming(n+1);% hamming wondow
%window= hanning(n+1);% hanning window
window= kaiser(n+1); % kasiser window
wn=2*(fp/fs)
%b=fir1(n,wn,window)
b=fir1(n,wn,'high',window)
[H,w]=freqz(b,1)
subplot(2,1,1)
plot(w/pi, 20*log(abs(H)))
xlabel('nf')
ylabel('mag in dB')
title("mag response")
subplot(2,1,2) plot(w/pi, angle(H))
xlabel('nf')
ylabel('mag in dB')
title("phase response")
```
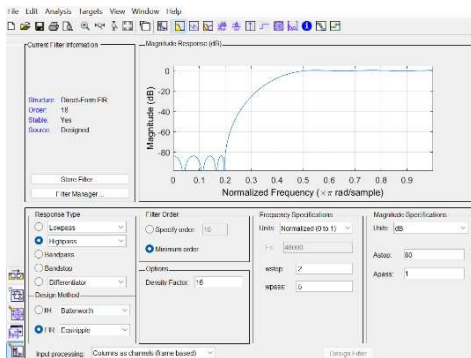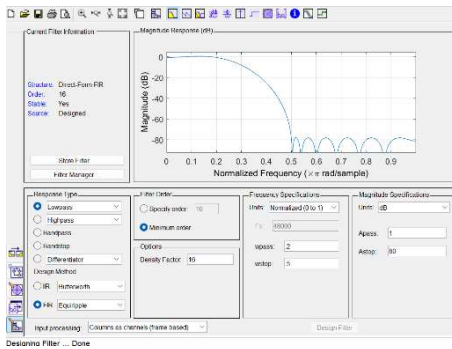
OUTPUT:
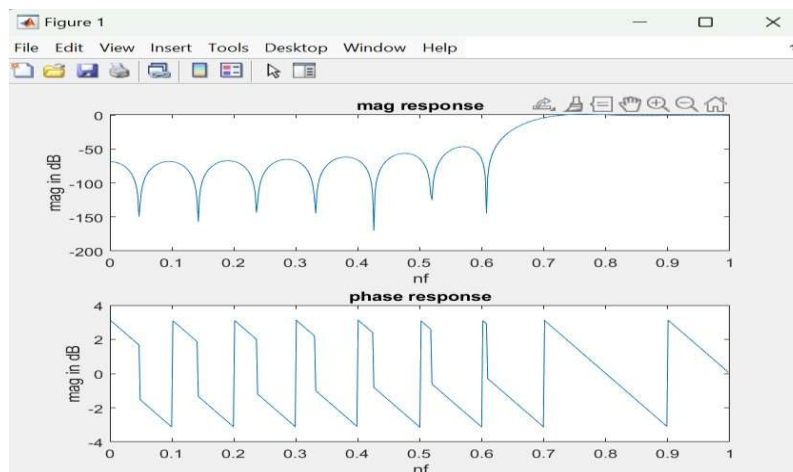
SIMULINK DIAGRAM:
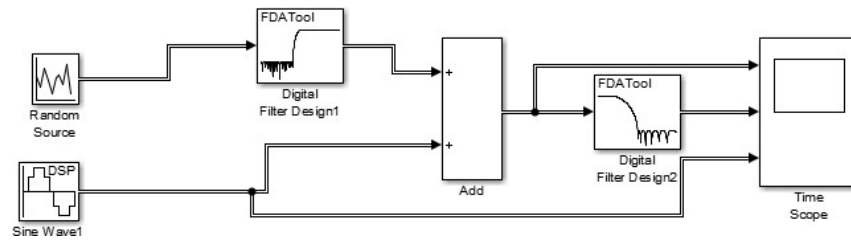
FILTERS PARAMETERS:

Highpass Filter:

- ➢ Response Type = Highpass
- ➢ Design Method = FIR, Equiripple
- ➢ Filter Order = Minimum order
- ➢ Units = Normalized (0 to 1)
- ➢ wstop = 0.2
- ➢ wpass = 0.5

Lowpassfilter

> ➢ Response Type = Lowpass
> ➢ Design Method = FIR, Equiripple
> ➢ Filter Order = Minimum order
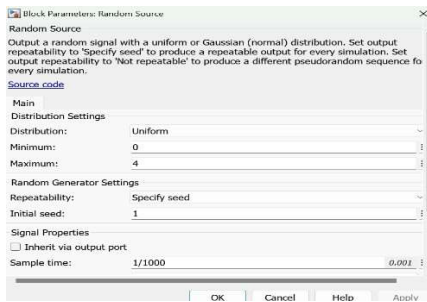> ➢ Units = Normalized (0 to 1)
> ➢ wpass = 0.2
> ➢ wstop =0.5

Filter High-Frequency Noise in Simulink:
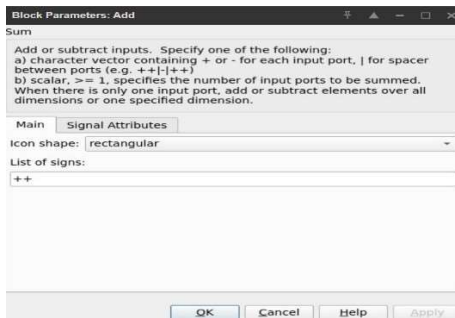
Sine Wave block:

> ➢ Frequency (Hz) = 75
> ➢ Sample time = 1/1000
> ➢ Samples per frame = 50
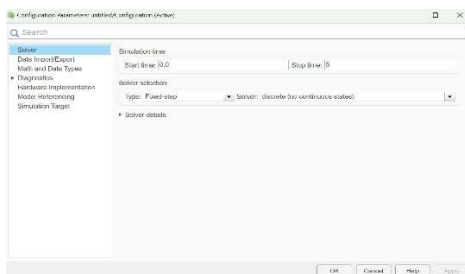
Random Source block:

- ➢ Source type = = Uniform
- ➢ Minimum = 0 • Maximum = 4
- ➢ Sample time = 1/1000
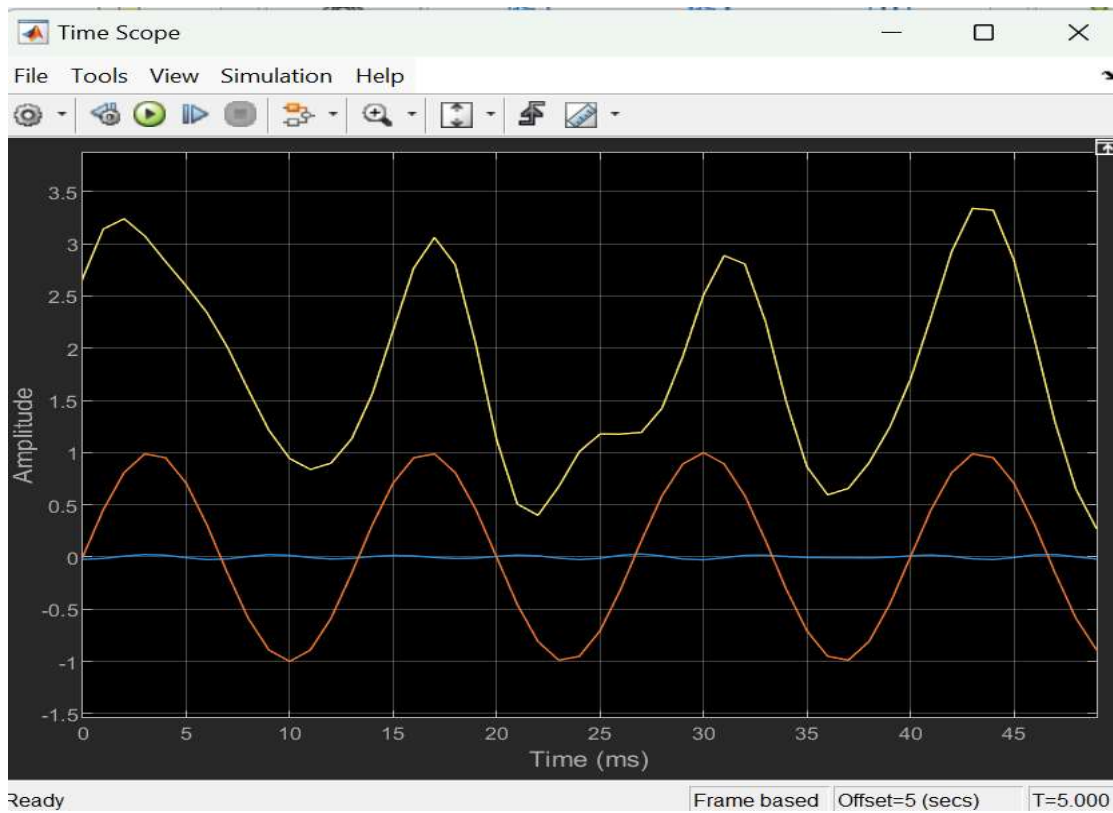- ➢ Samples per frame = 50

Add block

- ➢ Icon shape = rectangular
- ➢ List of signs = ++

Model Settings

- ➢ Start time = 0
- ➢ Stop time = 5
- ➢ Type = Fixed-step
- ➢ Solver = Discrete (no continuous states)

RESULTS AND DISCUSSION:

CONCLUSION:

we analyzed the frequency response of FIR filters designed using various window functions in Simulink and MATLAB. The window functions included Rectangular, Triangular, Hanning, and Kaiser. Each window function provided unique characteristics that influenced the FIR filter's performance in terms of main lobe width and side lobe levels.