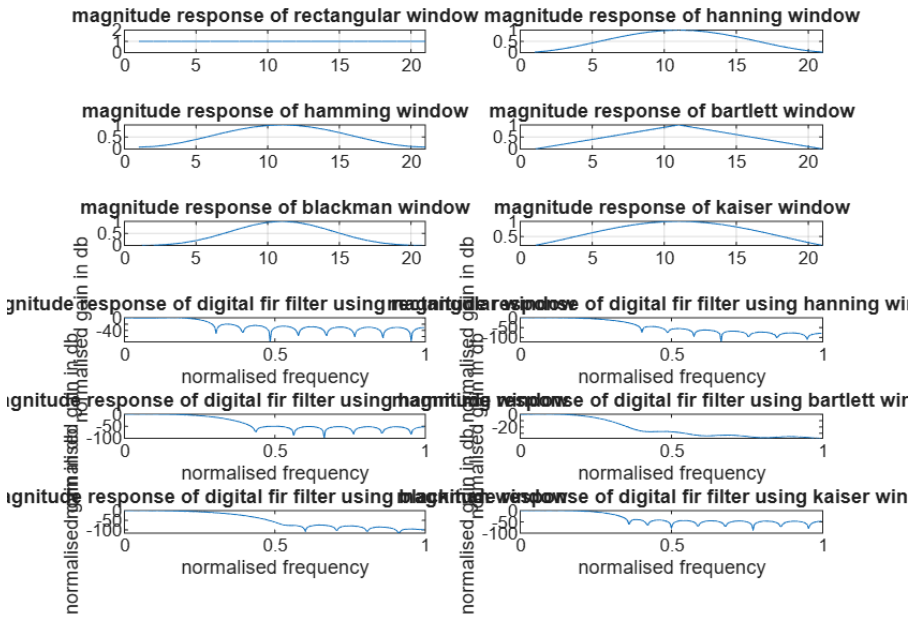
```
clc;
close all;
clear all;

fp=input('Enter the Passband frequency : ');
fs=input('Enter the Stopband frequency : ');
rp=input('Enter the Passband ripple : ');
rs=input('Enter the Stopband ripple : ');
f=input('Enter the Sampling frequency : ');
B=input('Enter the Beta value : ');
wp=2*(fp/f);
ws=2*(fs/f);

%%wn=[wp ws];%%only for bandpass and bandstop
num=-20*log10(sqrt(rp*rs))-13;
den=14.6*(fs-fp)/f;
n=ceil(num/den);

if n < 1        % ensure positive order
    n = 20;
end

n1=n+1;
if(rem(n,2)~=0)
    n1=n;
    n=n-1;
end

y1=boxcar(n1);
y2=hanning(n1);
y3=hamming(n1);
y4=bartlett(n1);
y5=blackman(n1);
y6=kaiser(n1,B);     % added beta argument

subplot(6,2,1);
plot(y1);
title('magnitude response of rectangular window');
grid on;

subplot(6,2,2);
plot(y2);
title('magnitude response of hanning window');
grid on;

subplot(6,2,3);
plot(y3);
title('magnitude response of hamming window');
grid on;

subplot(6,2,4);
```

```
plot(y4);
title('magnitude response of bartlett window');
grid on;

subplot(6,2,5);
plot(y5);
title('magnitude response of blackman window');
grid on;

subplot(6,2,6);
plot(y6);
title('magnitude response of kaiser window');
grid on;

wp_normalized = fp / (f / 2);   % corrected normalization
b1=fir1(n,wp_normalized,'low',y1);
b2=fir1(n,wp_normalized,'low',y2);
b3=fir1(n,wp_normalized,'low',y3);
b4=fir1(n,wp_normalized,'low',y4);
b5=fir1(n,wp_normalized,'low',y5);
b6=fir1(n,wp_normalized,'low',y6);

[h1,o1]=freqz(b1,1,256);        % fixed denominator to 1
m1=20*log10(abs(h1));
subplot(6,2,7);
plot(o1/pi,m1);
title('magnitude response of digital fir filter using rectangular window');
xlabel('normalised frequency');
ylabel('normalised gain in db');

[h2,o2]=freqz(b2,1,256);        % fixed denominator
m2=20*log10(abs(h2));
subplot(6,2,8);
plot(o2/pi,m2);
title('magnitude response of digital fir filter using hanning window');
xlabel('normalised frequency');
ylabel('normalised gain in db');

[h3,o3]=freqz(b3,1,256);        % fixed denominator
m3=20*log10(abs(h3));
subplot(6,2,9);
plot(o3/pi,m3);
title('magnitude response of digital fir filter using hammimg window');
xlabel('normalised frequency');
ylabel('normalised gain in db');

[h4,o4]=freqz(b4,1,256);        % fixed denominator
m4=20*log10(abs(h4));
subplot(6,2,10);
plot(o4/pi,m4);
title('magnitude response of digital fir filter using bartlett window');
xlabel('normalised frequency');
```

```
ylabel('normalised gain in db');

[h5,o5]=freqz(b5,1,256);        % fixed denominator
m5=20*log10(abs(h5));
subplot(6,2,11);
plot(o5/pi,m5);
title('magnitude response of digital fir filter using blackman window');
xlabel('normalised frequency');
ylabel('normalised gain in db');

[h6,o6]=freqz(b6,1,256);        % fixed denominator
m6=20*log10(abs(h6));
subplot(6,2,12);
plot(o6/pi,m6);
title('magnitude response of digital fir filter using kaiser window');
xlabel('normalised frequency');
ylabel('normalised gain in db');
```




```
% Input
% passband freq = 500
% stopband freq = 800
% passband ripple = 0.5
% stopband ripple = 40
% sampling freq = 4000
% beta value = 3
```