**DESIGN OF IIR FILTERS**

**LOW PASS IIR FILTER**

MATLAB CODE:-

clc;clear all;close all;

alpp=5;

alpstop=30;

%wp=0.1;

%ws=0.2;

%ws=[0.2 0.7];

%wp=[0.1 0.8];

fp=400;

fstop=800;

fs=2000;

wp=2\*fp/fs;

ws=2\*fstop/fs;

[n,wn]=buttord(wp,ws,alpp,alpstop);

[b,a]=butter(n,wn,'low');

n1=fvtool(b,a);

w=0:0.01:pi;

[h,om]=freqz(b,a,w);

m=abs(h);

ang=angle(h);

subplot(2,1,1);

plot(om/pi,20\*log(m));

grid;

xlabel('Frequency(radians/sample))');

ylabel('Magnitude()decibel)');

title('Magnitude response of IIR-LP filter');

subplot(2,1,2);

plot(om/pi,ang);

grid;

xlabel('Frequency(radians/samples)');

ylabel('Phase angle(degrees)');

title('Phase angle response of IIR LP filter');

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**BANDPASS IIR FILTER**

MATLAB code:-

clc;clear all;close all;

alpp=5;

alpstop=30;

%wp=0.1;

%ws=0.2;

ws=[0.2 0.7];

wp=[0.1 0.8];

fp=400;

fstop=800;

fs=2000;

%wp=2\*fp/fs;

%ws=2\*fstop/fs;

[n,wn]=buttord(wp,ws,alpp,alpstop);

[b,a]=butter(n,wn,'stop');

n1=fvtool(b,a);

w=0:0.01:pi;

[h,om]=freqz(b,a,w);

m=abs(h);

ang=angle(h);

subplot(2,1,1);

plot(om/pi,20\*log(m));

grid;

xlabel('Frequency(radians/sample))');

ylabel('Magnitude()decibel)');

title('Magnitude response of IIR BANDSTOP filter');

subplot(2,1,2);

plot(om/pi,ang);

grid;

xlabel('Frequency(radians/samples)');

ylabel('Phase angle(degrees)');

title('Phase angle response of IIR BANDSTOP filter');

