**CHEBYSHEV FILTER**

**clear all;**

**clc;**

**close all;**

**Ap=0.8;**

**As=0.2;**

**digital\_pass = 0.2\*pi;**

**digital\_stop = 0.6\*pi;**

**pass\_att = -20\*log10(Ap);**

**stop\_att = -20\*log10(As);**

**n= input ('Enter 1 for IIT \n Enter 2 for BLT \n');**

**if (n==1)**

**T=1;**

**analog\_pass = digital\_pass/T;**

**analog\_stop = digital\_stop/T;**

**else**

**T=2;**

**analog\_pass = (2/T)\*tan (digital\_pass/2);**

**analog\_stop = (2/T)\*tan(digital\_stop/2);**

**end**

**[N,CF]=cheb1ord(analog\_pass,analog\_stop,pass\_att,stop\_att,'s');**

**N**

**[Bn,An]=cheby1(N,pass\_att,1,'s');**

**HSn=tf(Bn,An);**

**HSn**

**[B,A]=cheby1 (N,pass\_att,CF, 's');**

**Hs=tf(B,A);**

**Hs**

**if (n==1)**

**[num,den] = impinvar (B,A,1/T);**

**else**

**[num,den] = bilinear (B,A,1/T);**

**end**

**Hz = tf (num, den,T);**

**Hz**

**w= 0:pi/16:pi;**

**Hw = freqz(num,den,w);**

**Hw\_mag=abs(Hw);**

**subplot(2,2,1)**

**plot(w/pi, Hw\_mag);**

**grid on;**

**title('Magnitude response');**

**subplot(2,2,2)**

**plot(w/pi,angle(Hw));**

**grid on;**

**title('Phase Response');**

**%butterworth filter%**

**clc;**

**clear all;**

**close all**

**Ap=0.8;**

**As=0.2;**

**digital\_pass=0.2\*pi;**

**digital\_stop=0.6\*pi;**

**pass\_attenuation = -20\*log10(Ap);**

**stop\_attenuation = -20\*log10(As);**

**n=input('Enter 1 for IIT\nEnter 2 for BLT\n');**

**if (n==1)**

**T=1;**

**analog\_pass= digital\_pass/T;**

**analog\_stop=digital\_stop/T;**

**else**

**T=2;**

**analog\_pass=(2/T)\*tan(digital\_pass/2);**

**analog\_stop=(2/T)\*tan(digital\_stop/2);**

**end**

**[N,CF]= buttord(analog\_pass,analog\_stop,pass\_attenuation,stop\_attenuation,'s');**

**N**

**[Bn,An] = butter(N,1,'s')**

**HSn= tf(Bn,An);**

**HSn**

**[B,A] = butter(N,CF,'s');**

**Hs = tf(B,A);**

**Hs**

**if ( n==1)**

**[num,den]= impinvar(B,A,1/T);**

**else**

**[num,den]= bilinear(B,A,1/T);**

**end**

**Hz = tf(num ,den,T);**

**Hz**

**w = 0:pi/16:pi;**

**Hw = freqz (num,den,w);**

**Hw\_mag = abs (Hw);**

**subplot (2,2,1)**

**plot(w/pi, Hw\_mag);**

**grid on;**

**title('Magnitude response');**

**subplot(2,2,2)**

**plot(w/pi, angle(Hw));**

**grid on;**

**title('Phase response');**