

## DSP Experiment 11 Output

### Digital Butterworth Using Bilinear Transformation

```
digital_butterworth.sce (C:\Users\DSP Lab\Desktop\Kunal Keshan - DSP Experiment 11\digital_b...
File Edit Format Options Window Execute ?
digital_butterworth.sce (C:\Users\DSP Lab\Desktop\Kunal Keshan - DSP Experiment 11\digital_butterworth.sce) - Scilab 6.1.1 Console
digital_butterworth.sce
4 wp=0.7//input('enter the value of wp in rad/s')
5 as=10//input('enter the value of as in dB')
6 fp=1000//input('enter the value of fp in Hz')
7 fs=350//input('enter the value of fs in Hz')
8 f=5000//input('enter the value of f')
9
10 T=1/f;
11 wp=2*pi*fp;
12 ws=2*pi*fs;
13 op=2/T*tan(wp*T/2)
14 os=2/T*tan(ws*T/2)
15 N=log(sqrt((10**(0.1*as)-1)/(10**(0.1*ap)-1)))/log(op/os)
16 disp(ceil(N));
17 s=s;
18 HS=1/(s+1);
19 oc=op;
20 HS1=horner(HS,oc/s);
21 disp(HS1,'Normalized transfer function, H(s)=');
22 z=z;
23 HZ=horner(HS,(2/T)*(z-1)/(z+1));
24 disp(HZ,'H(z)=');
25

1.
-----
s
726S.4253 +s
"Normalized transfer function, H(s) ="
-----
1 +z
-----
-9999 +10001z
" H(z) ="
-->
```

## Digital Butterworth Using Impulse Invariant Method

```
14 I4
13 q1ab(Hz','Hs=') :
12 Hs=(S\ (1-8v(bS*1)*Sv(-1))) - (S\ (1-8v(b1*1)*Sv(-1))) :
11 z=8 :
10 bS=-1 :
9 b1=-S :
8 q1ab(e1fa','Escotized,Hs=') :
7 e1fa=b1aa(Hs) :
6 Hs=S\ (2vS+3*a+S) :
5 1=1 :
4 a=8 :
3 close :
2 c1c :
1 c1c1 :

q1ab(Hs','Hs=') :
Hs=
0.0482181 -0.203141s + s^2
-----
0.4820883s

"Escotized Hs="
(S) : [1x1 isctored] of a
(T) : [1x1 isctored] of a

q1ab(Hs','Hs=') :
Hs=
0.0482181 -0.203141s + s^2
-----
0.4820883s

"Escotized Hs="
(S) : [1x1 isctored] of a
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```