**ZTnIZT.m**

clc;

syms k n w z

F1=ztrans(2^n) % n as default time variable and 'z' as default variable in z-domain

F2=ztrans(2^n,w) % n as default time variable and 'w' as default variable in z-domain

F3=ztrans(2^k,k,w) % k as default time variable and 'w' as default variable in z-domain

F4=iztrans(z/(z-1))

F1 =

z/(z - 2)

F2 =

w/(w - 2)

F3 =

w/(w - 2)

F4 =

1

>>

**Invztx.m**

clc;

x=[1,zeros(1,10)]; % impulse input,length of the impulse must be equal to the number of terms in the inverse ZT

num=[10 5 0]; % coefficients of numerator

den=[1 -1.2 .2]; % coefficients of denominator

y=filter(num,den,x) % impulse response of the system

y =

10.0000 17.0000 18.4000 18.6800 18.7360 18.7472 18.7494 18.7499 18.7500 18.7500 18.7500

>>

**InvztxAntiCausal.m**

clc;

x=[1,zeros(1,10)]; % impulse input,length of the impulse must be equal to the number of terms in the inverse ZT

num=[0 5 10];

den=[.2 -1.2 1];

y=filter(num,den,x)

y =

1.0e+07 \*

0 0.0000 0.0000 0.0001 0.0005 0.0027 0.0137 0.0684 0.3418 1.7090 8.5449

>>

**Invztx1.m**

clc;

x=[1,zeros(1,10)]; % impulse input,length of the impulse must be equal to the number of terms in the inverse ZT

num=[1 -3];

den=[1 2 2];

y=filter(num,den,x)

y =

1 -5 8 -6 -4 20 -32 24 16 -80 128

>>

**InvztxAntiCausal1.m**

clc;

x=[1,zeros(1,10)]; % impulse input,length of the impulse must be equal to the number of terms in the inverse ZT

num=[0 -3 1];

den=[2 2 1];

y=filter(num,den,x)

y =

0 -1.5000 2.0000 -1.2500 0.2500 0.3750 -0.5000 0.3125 -0.0625 -0.0938 0.1250

>>

>> num=[10 5 0];

>> den=[1 -1.2 .2];

>> filt(num,den,-1)

ans =

10 + 5 z^-1

-----------------------

1 - 1.2 z^-1 + 0.2 z^-2

Sample time: unspecified

Discrete-time transfer function.

>>

ZPofTF.m

clc;

num=[1 -3]; % coefficients of numerator

den=[1 2 2]; % coefficients of denominator

zplane(num,den); % plot in the z-plane

sys=filt(num,den,-1) % discrete system transform function in z^-1 polynomials

[R,P,K]=residuez(num,den) % Partial fraction expansion only if poles and zeros are real

omega=-2\*pi:pi/100:2\*pi;

y=freqz(num,den,omega); % Frequency response

figure;

subplot(211);

plot(omega,abs(y));

subplot(212);

plot(omega,angle(y));

sys =

1 - 3 z^-1

-------------------

1 + 2 z^-1 + 2 z^-2

Sample time: unspecified

Discrete-time transfer function.

R =

0.5000 + 2.0000i

0.5000 - 2.0000i

P =

-1.0000 + 1.0000i

-1.0000 - 1.0000i

K =

[]

>>





ZPofTF1.m

clc;

num=[1 -3]; % coefficients of numerator

den=[1 3 2]; % coefficients of denominator

zplane(num,den); % plot in the z-plane

sys=filt(num,den,-1) % discrete system transform function in z^-1 polynomials

[R,P,K]=residuez(num,den) % Partial fraction expansion only if poles and zeros are real

omega=-2\*pi:pi/100:2\*pi;

y=freqz(num,den,omega); % Frequency response

figure;

subplot(211);

plot(omega,abs(y));

subplot(212);

plot(omega,angle(y));

sys =

1 - 3 z^-1

-------------------

1 + 3 z^-1 + 2 z^-2

Sample time: unspecified

Discrete-time transfer function.

R =

5

-4

P =

-2

-1

K =

[]

>>





Assignment 2;

clc;

num=[1 -1]; % coefficients of numerator

den=[1 0]; % coefficients of denominator

zplane(num,den); % plot in the z-plane

sys=filt(num,den,-1) % discrete system transform function in z^-1 polynomials

[R,P,K]=residue(num,den)

omega=-2\*pi:pi/100:2\*pi;

y=freqz(num,den,omega); % Frequency response

figure;

subplot(211);

plot(omega,abs(y));

subplot(212);

plot(omega,angle(y));

sys =

1 - z^-1

Sample time: unspecified

Discrete-time transfer function.

R =

-1

P =

0

K =

1

>>



