Contents

Part 1

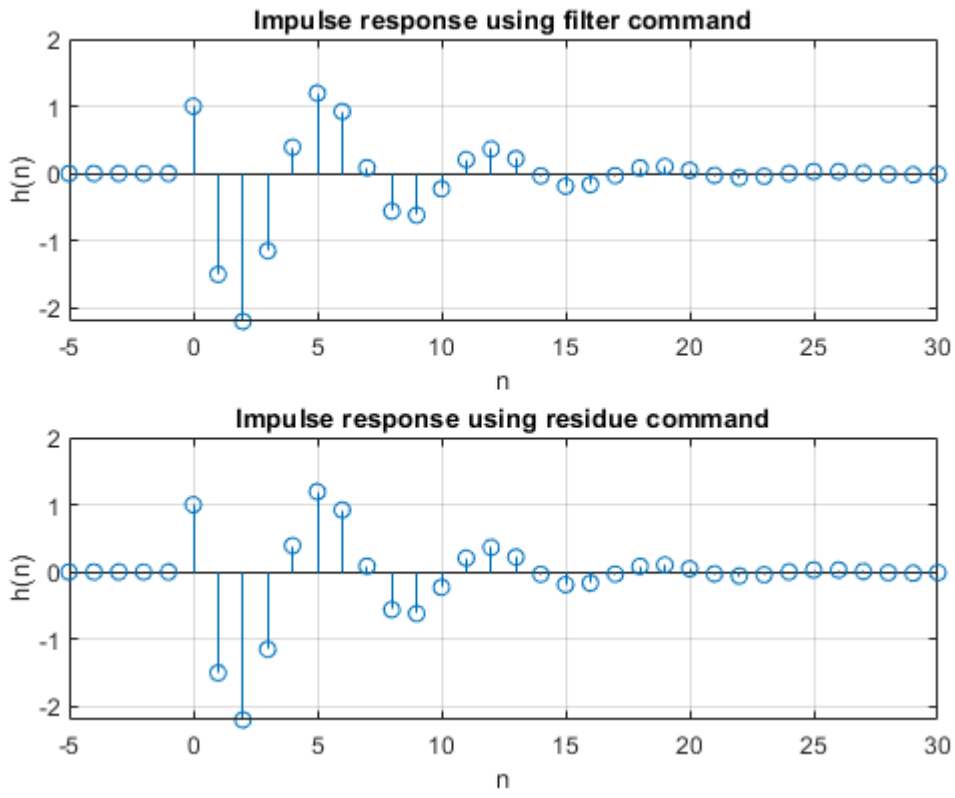
```
b=[1 -2.5];%coefficients of numerator of H(z)



a=[1 -1 0.7];%coefficients of denominator of H(z)



x=(n==0);%Impulse function



y = filter(b,a,x); % Impulse response



% It is same answer as my hand calculation.
```

Part 2

```
b=[1 -2.5];%coefficients of numerator of H(z)



a=[1 -1 0.7];%coefficients of denominator of H(z)



n=-5:30;



x=(n==0);%Impulse function
```

```
%using filter function

y=filter(b,a,x);%Impulse response

figure(1);

subplot(2,1,1)

stem(n,y);grid;

title('Impulse response using filter command');

xlabel('n');ylabel('h(n)');

%using partial fraction method

[r p k]=residue(b,a); %residue function

h=((r(1)*(p(1).^n))+(r(2)*(p(2).^n))).*(n>=0);

subplot(2,1,2)
```

```
stem(n,h);grid;


title('Impulse response using residue command');


xlabel('n');


ylabel('h(n)');
```



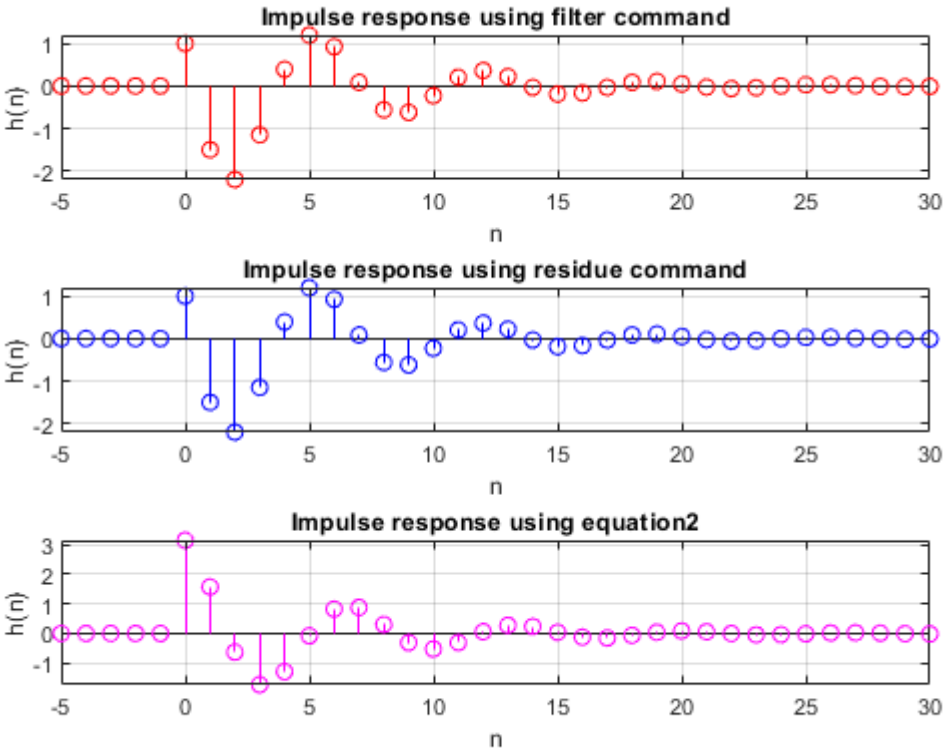
Part 3

```
b=[1 -2.5];%coefficients of numerator of H(z)
```

```
a=[1 -1 0.7];%coefficients of denominator of H(z)

n=-5:30;

x=(n==0);%Impulse function

%using filter function

y=filter(b,a,x);%Impulse response

figure(2);

subplot(3,1,1)

stem(n,y,'r');grid;

title('Impulse response using filter command');

xlabel('n');

ylabel('h(n)');
```

```
%using partial fraction method

[r p k]=residue(b,a); %residue function

h=((r(1)*(p(1).^n))+(r(2)*(p(2).^n))).*(n>=0);

subplot(3,1,2)

stem(n,h,'b');grid;

title('Impulse response using residue command');

xlabel('n');ylabel('h(n)');

%using equation(2)

[r p k]=residue(b,a); %residue function

R1=abs(r(1));

w0=angle(p(1));r=abs(p(1));alpha=angle(r(1));
```

```
h=2*R1*(r.^n).*(cos((w0*n)+alpha)).*(n>=0);



subplot(3,1,3)



stem(n,h,'m');grid;



title('Impulse response using equation2');



xlabel('n');ylabel('h(n)');
```

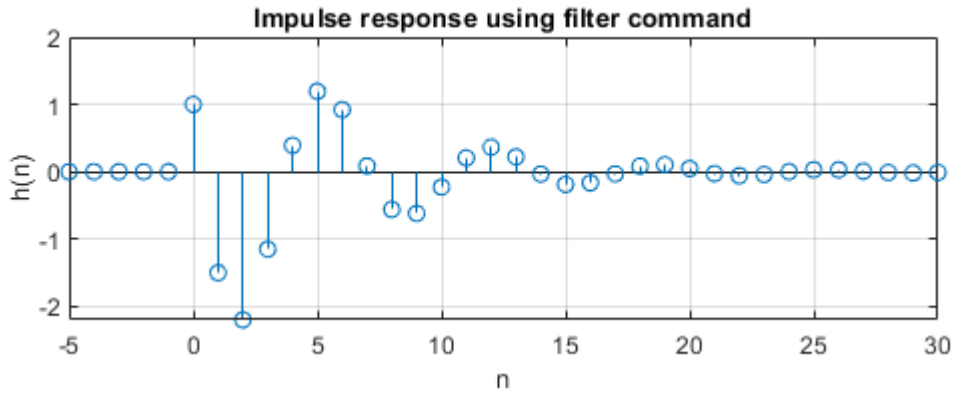


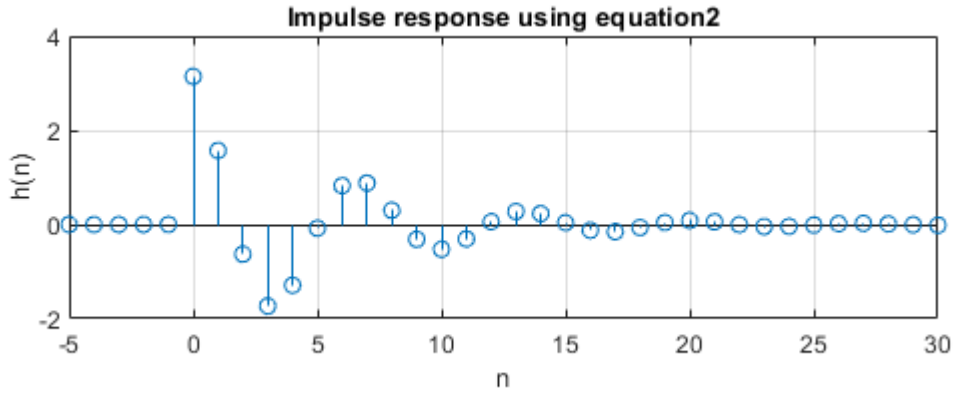
Part 4

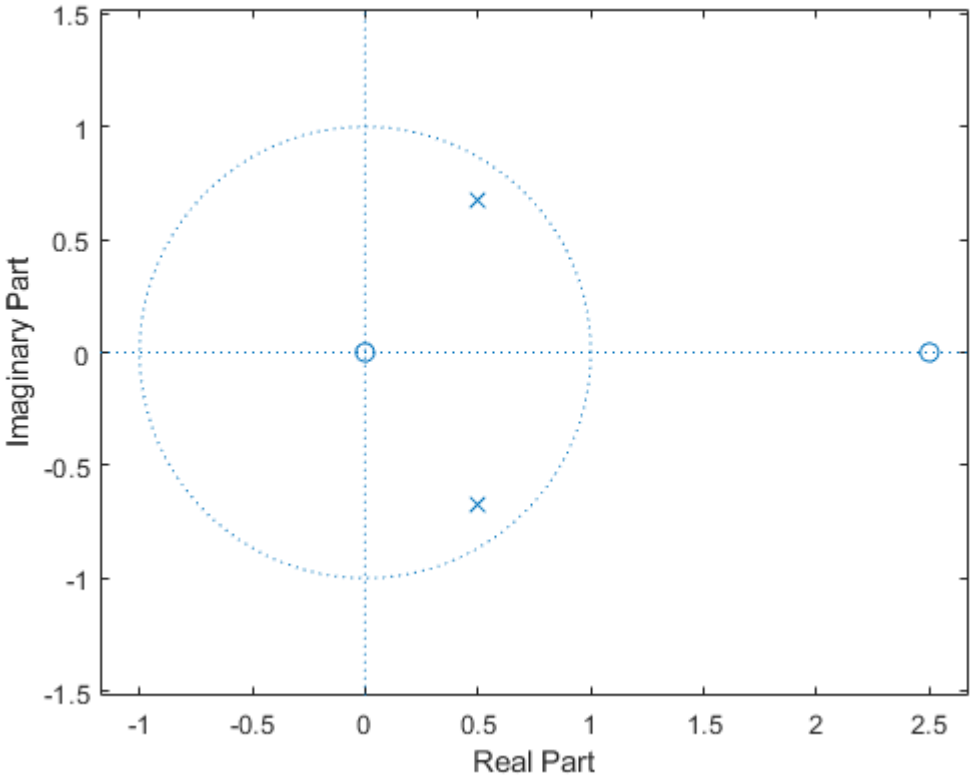
```
b=[1 -2.5];%coefficients of numerator of H(z)
```

```
a=[1 -1 0.7];%coefficients of denominator of H(z)

n=-5:30;

x=(n==0);%Impulse function

y=filter(b,a,x);%Impulse response

figure(3);

subplot(2,1,1)

stem(n,y);grid;

title('Impulse response using filter command');

xlabel('n');

ylabel('h(n)');

%using equation(2)
```

```
[r p k]=residue(b,a); %residue function

R1=abs(r(1));

w0=angle(p(1));r=abs(p(1));alpha=angle(r(1));

h=2*R1*(r.^n).*(cos((w0*n)+alpha)).*(n>=0);

subplot(2,1,2)

stem(n,h);grid;

title('Impulse response using equation2');

xlabel('n');

ylabel('h(n)');

figure(4);

zplane(b,a)
```





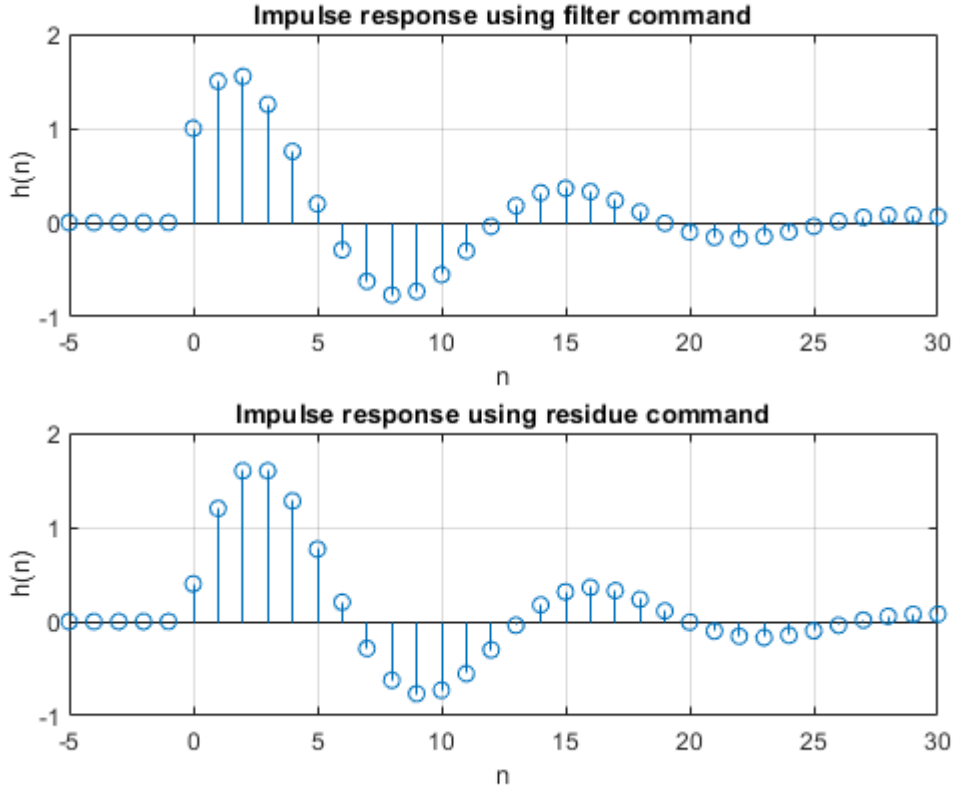


Part 5

```
b=[1 -0.6];%coefficients of numerator of H(z)
```

```
a=[1 -2.1 1.6 -0.4];%coefficients of denominator of H(z)

n=-5:30;

x=(n==0);%Impulse function

y=filter(b,a,x);%Impulse response

figure(5);

subplot(2,1,1)

stem(n,y);grid;

title('Impulse response using filter command');

xlabel('n');

ylabel('h(n)');

%using partial fraction method
```

```
[r p k]=residue(b,a); %residue function

h=((r(1)*(p(1).^n))+(r(2)*(p(2).^n))).*(n>=0);

subplot(2,1,2)

stem(n,h);grid;

title('Impulse response using residue command');

xlabel('n');

ylabel('h(n)');
```



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