

Fig 1: Case I RC Filter

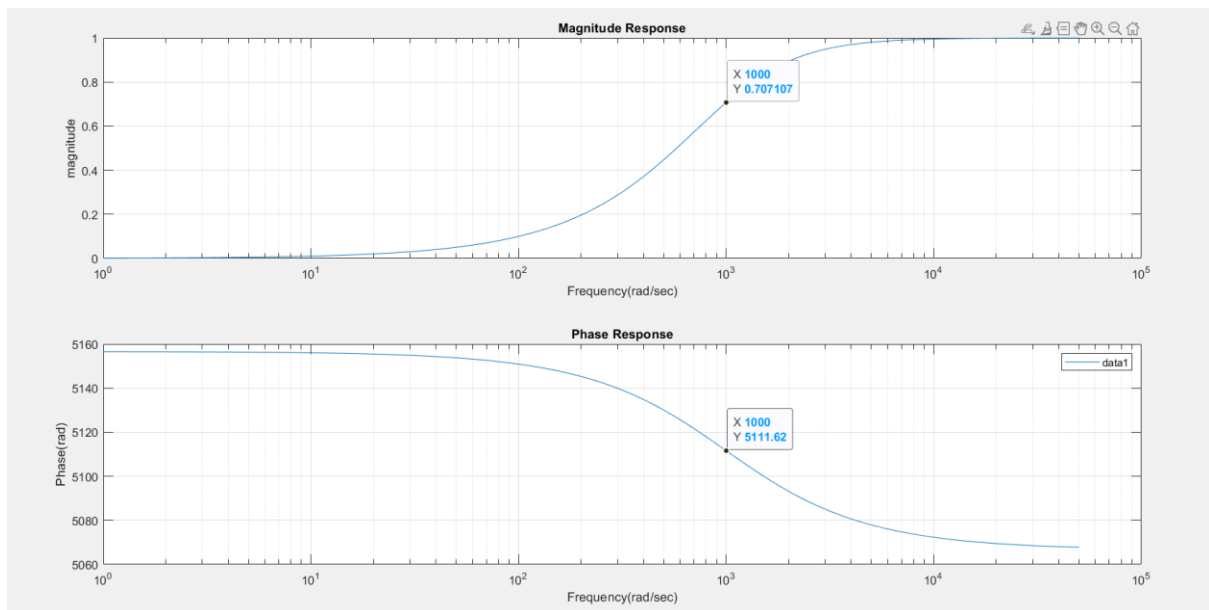


Fig 2: Case II CR Filter

## Code:

### Case I RC Filter:

```
clear all;
close all;
clc;
R=1000;
C=10^-6;
W=0:50000;
mag=1./sqrt(1+(R*C*W).^2);
subplot(2,1,1);
semilogx(W,mag); %logscale along x-axis to visualize larger value to smaller value
title('Magnitude Response');
xlabel('Frequency(rad/sec));
ylabel('Magnitude(dB)');
grid on;
phase=-atan((R*W*C)).*180/pi;
subplot(2,1,2);
semilogx(W,phase);
title('phase Response');
xlabel('Frequency(rad/sec));
ylabel('phase(rad)');
grid on;
```

### Case II CR Filter:

```
clear all;
close all;
clc;
R=1000;
C=10^-6;
W=0:50000;
mag=W./sqrt((W).^2+(1/(R*C)).^2));
subplot(2,1,1);
semilogx(W,mag); %logscale along x-axis to visualize larger value to smaller value
title('Magnitude Response');
xlabel('Frequency(rad/sec));
ylabel('magnitude(dB)');
grid on;
phase=(90-atan((R*W*C))).*180/pi;
subplot(2,1,2);
semilogx(W,phase);
title('phase Response');
xlabel('Frequency(rad/sec));
ylabel('phase(rad)');
grid on;
```

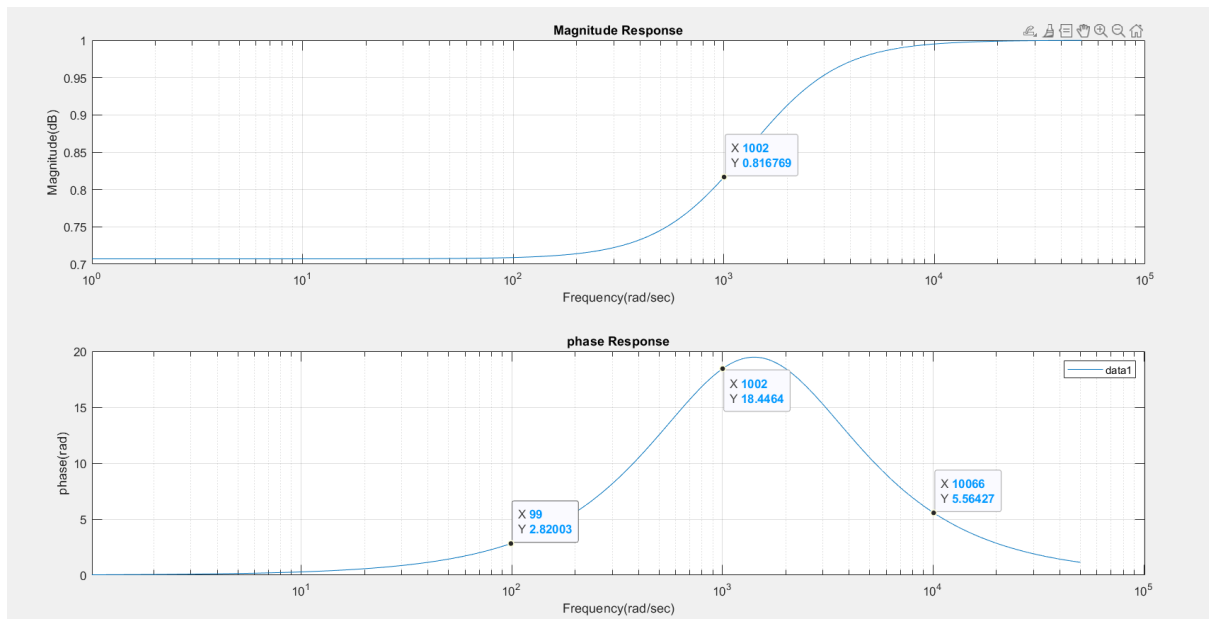


Fig 3: Case III C1R1R2 Filter

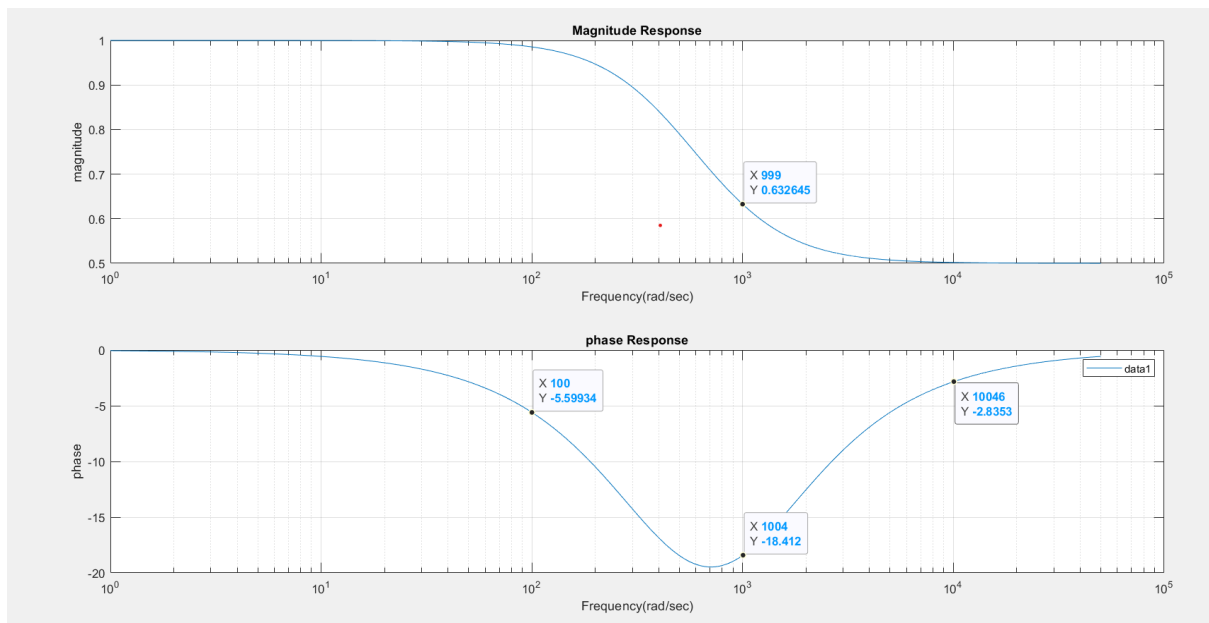


Fig 4: Case IV R1R2C1 Filter

### **Case III C1R1R2 Filter :**

```
clear all;
close all;
clc;
R1=1000;
R2=1000;
C1=10^-6;
W=0:50000;
mag=(sqrt(1+(1./(R1*C1*W).^2)))/(sqrt(1+(1./(R2*C1*W).^2)+(1./(R1*C1*W).^2)));
subplot(2,1,1);
semilogx(W,mag); %logscale along x-axis to visualize larger value to smaller value
title('Magnitude Response');
xlabel('Frequency(rad/sec)');
ylabel('magnitude(dB)');
grid on;
phase=(atan((R1*W*C1))-atan((W*R1*R2*C1)/(R1+R2)) ).*180/pi;
subplot(2,1,2);
semilogx(W,phase);
title('phase Response');
xlabel('Frequency(rad/sec)');
ylabel('phase(rad)');
grid on;
```

### **Case IV C1R1R2 Filter :**

```
clear all;
close all;
clc;
R1=1000;
R2=1000;
C1=10^-6;
W=0:50000;
mag=(R2./(R1+R2)).*(sqrt(1+(1./(R2*C1*W).^2)))/(sqrt(1+(1./((R1+R2)*C1*W).^2)));
subplot(2,1,1);
semilogx(W,mag); %logscale along x-axis to visualize larger value to smaller value
title('Magnitude Response');
xlabel('Frequency(rad/sec)');
ylabel('magnitude(dB)');
grid on;
phase=(atan((R2*W*C1))-atan((W*C1*(R1+R2)))).*180/pi;
subplot(2,1,2);
semilogx(W,phase);
title('phase Response');
xlabel('Frequency(rad/sec)');
ylabel('phase(rad)');
grid on;
```