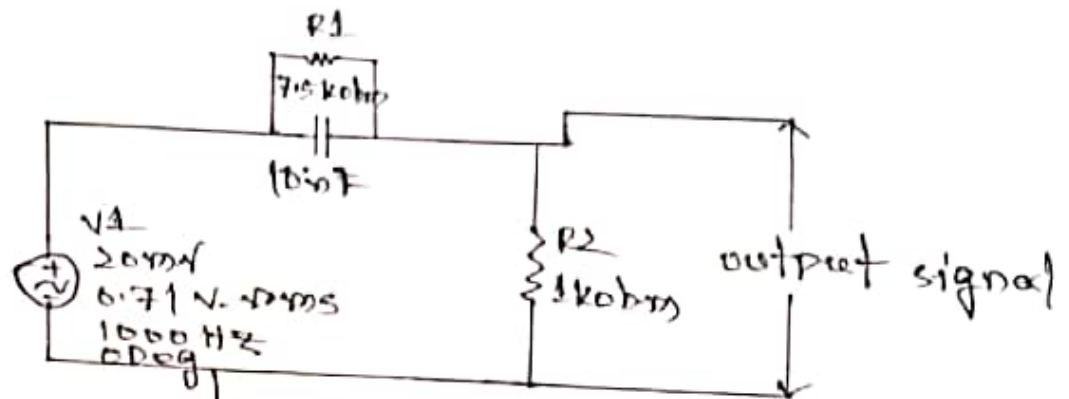


impedance, of the collector voltage increase. If the signal frequency is less than the impedance decrease which increase the collector and hence decrease the voltage. The pre-emphasis circuit then has voltage transfer ratio for frequency f as given by the equation,

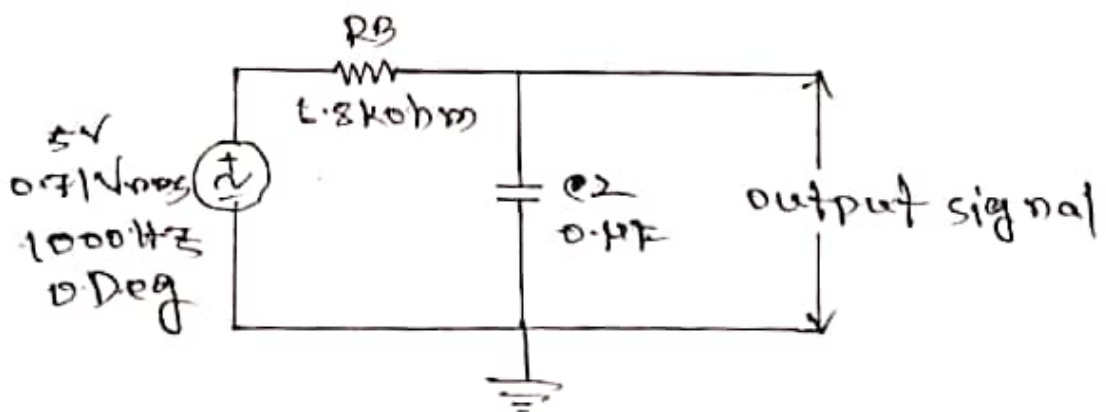
$$\frac{V_o}{V_i} = \frac{1}{\sqrt{1 + (f/f_c)^2}}$$

De-emphasis: The circuit is placed at the receiving side. It act as low pass filter. The boosting gain for higher frequency signal in the transmitting side is done by the pre-emphasis circuit is filtered to the same value of low pass filter.

Circuit Diagrams: For pre-emphasis:



For De-emphasis:



Source code in matlab:

```
f1 = input('Enter reference frequency:');  
for f = 1:50
```

```
    x(f) = (1/cos(1+(f1/f)^2));
```

```
    f2(f) = f;
```

```
end
```

```
subplot(2,1,1);
```

```
plot(f2,x);
```

```
title('Pre emphasis signal');
```

```
for f = 1:50
```

```
    y(f) = (1/cos(1+(f/f1)^2));
```

```
    f3(f) = f;
```

```
end
```

```
subplot(2,1,2);
```

```
plot(f3,y);
```

```
title('De emphasis signal');
```

input:

Enter reference frequency:

10

No of the experiment: 06

Name of the experiment: To write down a program using matlab for the generation of pre-emphasis and de-emphasis wave.

Objective:

- i) To observe the effects of pre-emphasis on given input signal.
- ii) To observe the effects of de-emphasis on given input signal.

Theory: The noise has a effect on the higher modulating frequencies than on the lower ones. Thus, if the higher frequencies were artificially boosted at the transmitter and correspondingly cut at the receiver an improvement in noise immunity could be expected, there by increasing the SNR ratio. This boosting of the higher modulating frequencies at the transmitter is known as pre-emphasis and the compensation at the receiver is called de-emphasis.

Pre-emphasis: The circuits are the transmitting side of the frequency modulator. It is used to increase the gain of the higher frequency component as the input signal frequency increased, the impedance