EXPERIMENT No.-9 Date-30/08/19

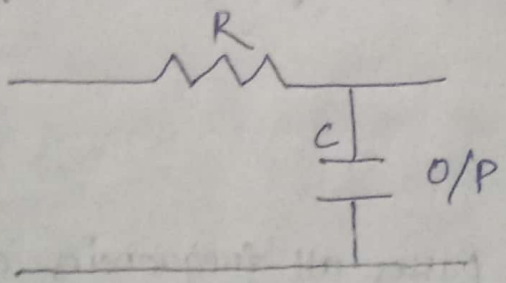
AIM:- To design RC low pass and high pass filter, to plot the frequency response of the filters and to see the low pass and high pass filters acting as integrators and differentiators.

-: APPARATUS REQUIRED :-

1. Decade Resistance Box
2. Decade Capacitance Box
3. Audio signal generators
4. Oscilloscope
5. AC/DC millivoltmeter

PROCEDURE

(A) A LPF is one that pass all frequencies below a selected value 'F_c' and attenuates higher frequencies. Such a filter can be realized by a series 'R' and shunt 'C' as shown below. Its characteristic is also shown.



Design :-

3db cut-off frequency 'f_c' = $\frac{1}{6.2 \times 8RC}$.

Choose fc anywhere betn 1KKz to 10KHz. Choose the value of 'C' between 0.01 μfd to 0.1 μfd F, calculate R ?

Connection R and C as shown. Connect an audio frequency signal generator at the input of LPF. Keeping input voltage at 1V single wave. Measure the output voltage of LPF by an AC/DC millivoltmeter.

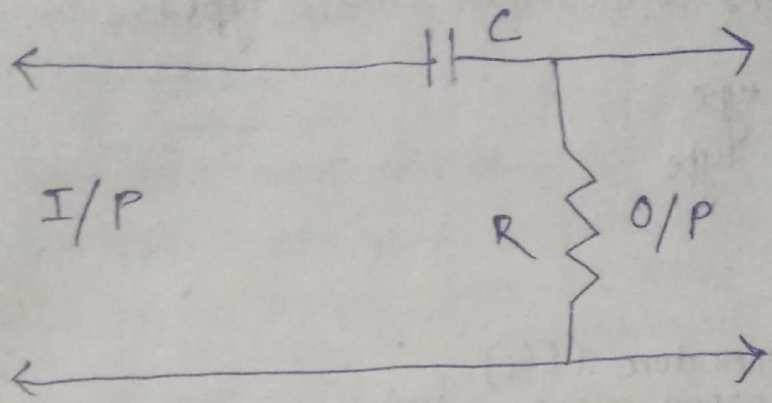
Connection R and C as shown. connect an audio-frequency signal generator at the input of LPF. Keeping input voltage.

Take the output reading for different frequencies 20 Hz to 20 KHz. Keeping input constant, plot the characteristic curve frequency Vs. Gain ( ) and verify fc?

Next feed a square (keeping at 2V r.m.s) of frequency 10 times less than the cut off frequency to it and 10 times greater the cut off frequency to it. Observe the input and output wave forms and verify at what condition of frequency, the LPF acts as an integrator and the type of output wave form?

(B) A HPF is one that passes all frequencies above a selected value and attenuates lower frequencies. Such a filter can be realized by a series by a series 'C' and shunt 'R' as shown.

its characteristics curve is also shown. Take the output reading by oscilloscope.



The design procedure is same as LPF. connect 'R' and 'C' as shown. The next procedure as LPF. Plot the characteristics curve frequency Vs gain in dB and verify fc?

Next feed square wave (keeping at 2VL r.m.s) of frequency 10 times less than fc, equal to 10 times greater than fc plot input and output waveforms.

Verify at what condition of frequency, the HPF acts as nothing but a differentiator.

Tabulation

Sl. No.	Frequency	Voltage

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30/8/19