



## **Department of Electrical Engineering**

**Course Code**

NA

**Subject**

Network Analysis Lab

**Instructor:**

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# **Semester Project Report**

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## Objective:

In this lab out task is to make Band pass filter using combination of High pass and low pass filter . And simulate it . Further patch on bread board.

## Procedure/Calculations:

- We took constant capacitor of 0.1uF for In low pass filter.
- Further we took constant capacitor of 0.01uF in High pass filter.

## Calculations:

### For Low Pass Filter:

For low pass filter we use the formula  $f_c = \frac{1}{2(3.14)(R)(C)}$

$$R1 = \frac{1}{2(3.14)(C)(f_c)} \quad R1 = \frac{1}{2(3.14)(83 \times 10^3)(0.1 \times 10^{-6})}$$

$$R1 = 19.7\Omega$$

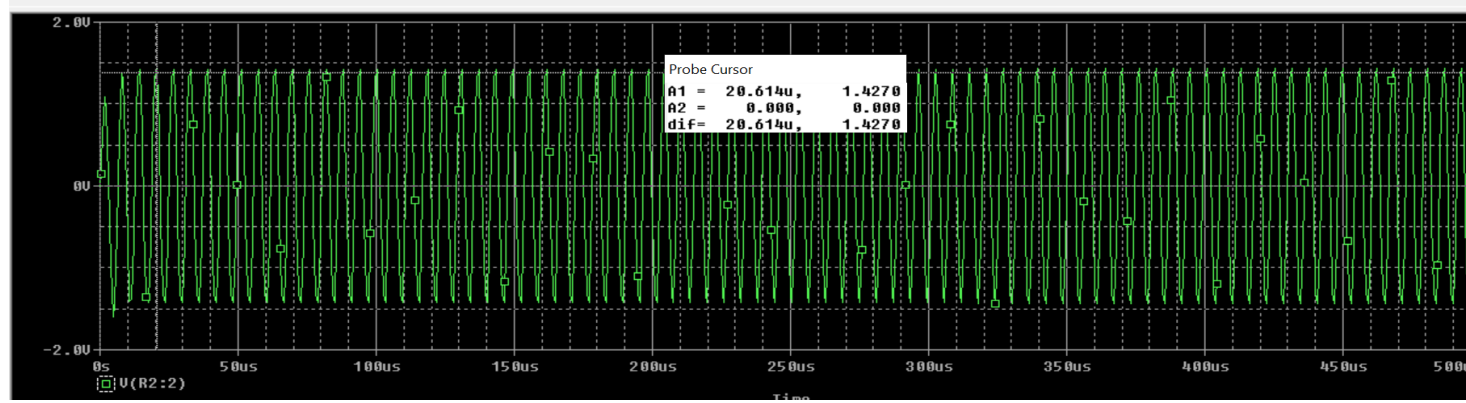
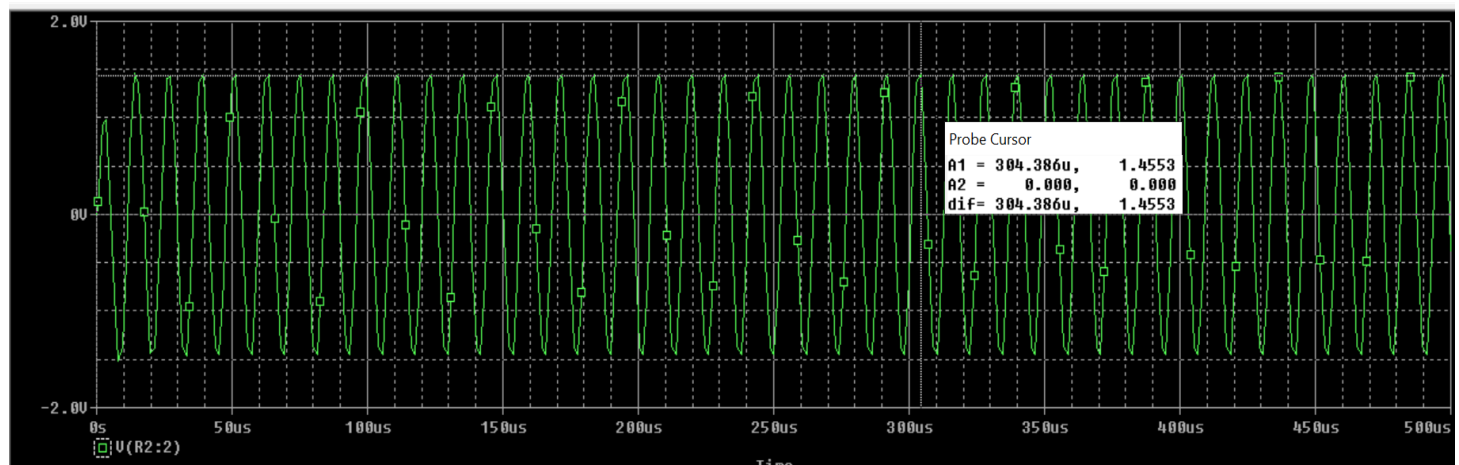
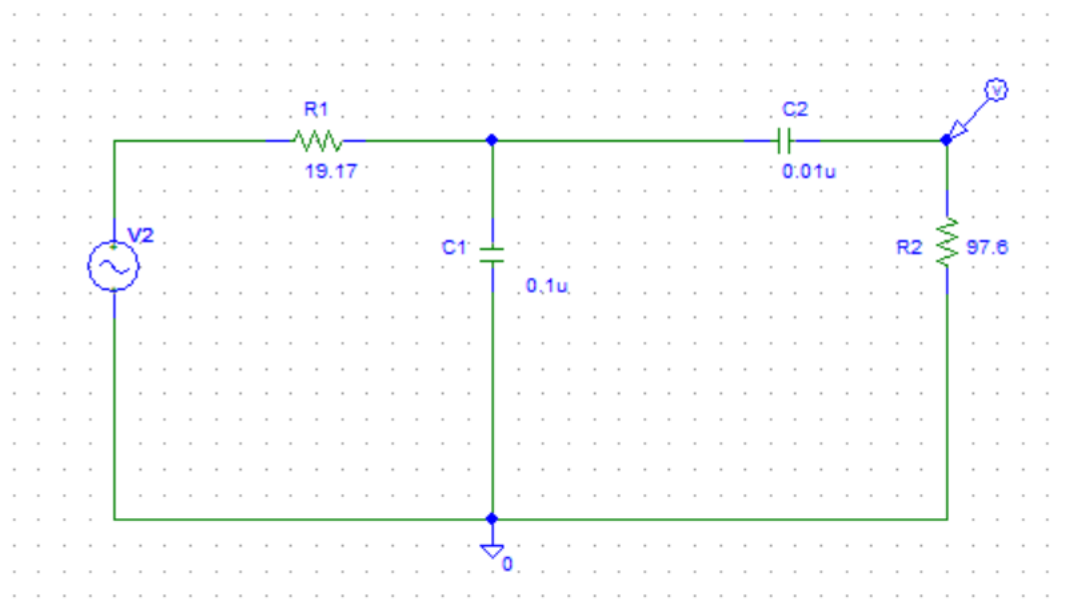
### For High Pass Filter:

For High pass filter use the following formula.

$$f_c = \frac{1}{2(3.14)(R)(C)} \quad R2 = \frac{1}{2(3.14)(C)(f_c)} \quad R2 = \frac{1}{2(3.14)(163 \times 10^3)(0.01 \times 10^{-6})}$$

$$R2 = 97.6\Omega$$

## Peak Voltages Using Vsin Source:



## Voltage Vs Frequency Table(Using Vsin):

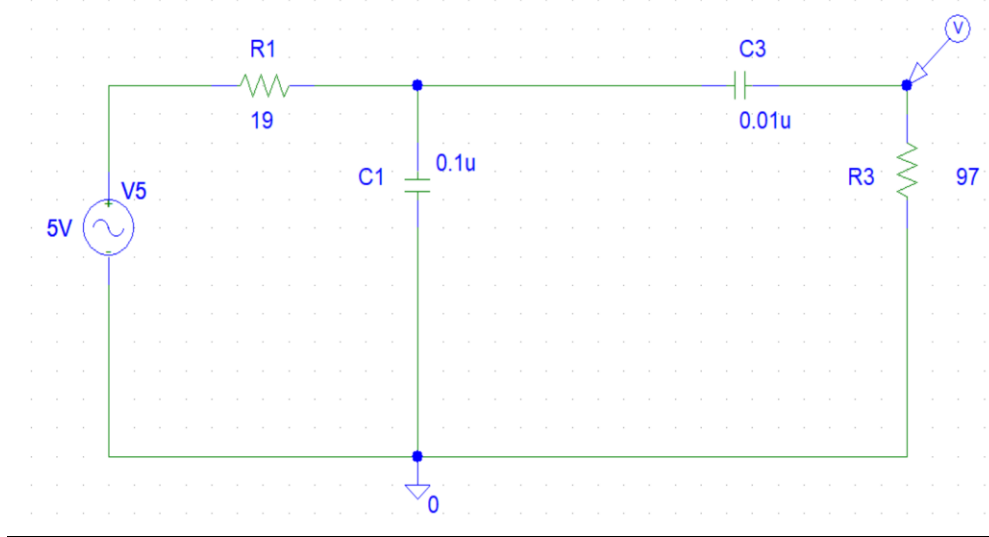
Frequency(KHz)	Peak Voltage(V)
75	1.4699
77	1.4843
79	1.4952
80	1.500
82	1.5128
83(Cut of Frequency 1)	1.5129
84	1.517
85	1.52
86	1.526
87.5	1.53
88	1.535
89	1.539
90	1.54
91	1.547
92	1.55
93	1.5532
94	1.554
95	1.559
97.6	1.56
98	1.5637
99	1.5671
100	1.5685
102	1.57
104	1.5743
105.8	1.5763
106.2	1.5768
107	1.5777

108	1.5792
109	1.5798
111	1.5807
113	1.581
115	1.5819
110	1.5803
112	1.5812
114	1.5818
117	1.582
118	1.5818
119	1.5814
120	1.5810
121	1.5806
122	1.5801
124	1.5789
126	1.5772
127	1.5768
128	1.5754
130	1.5738
132	1.5725
133	1.57
134	1.5692
135	1.5670
137	1.5646
138	1.5629
139	1.5611
140	1.5593
141	1.5583
143	1.5554
145	1.551

147	1.5465
149	1.5441
150	1.5422
151	1.5392
153	1.5353
156	1.5283
160	1.5195
161	1.5187
163(Cut of Frequency 2)	1.5132
172	1.4905
168	1.4985
170	1.4932
323	1.0774
335	1.0503

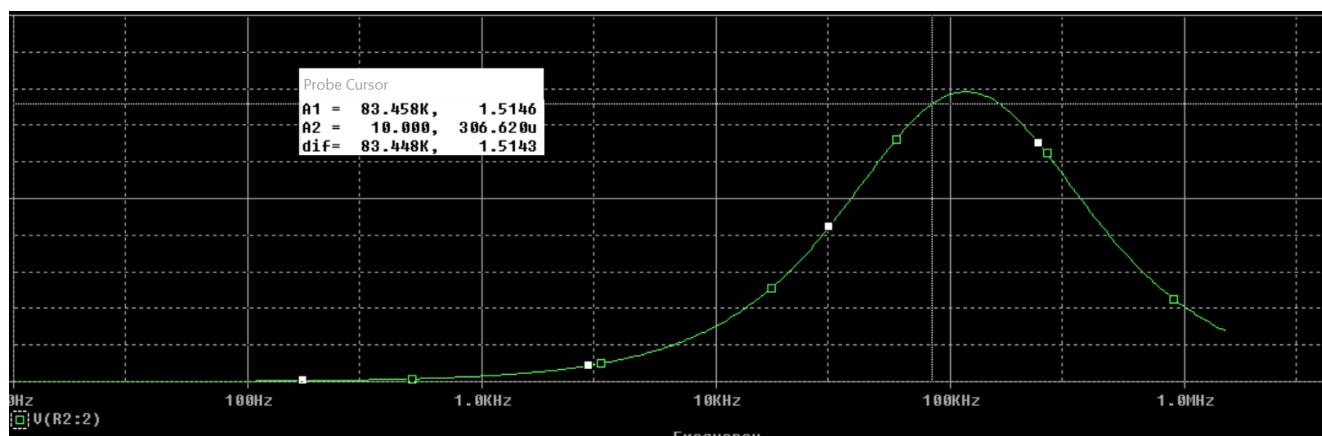
## AC Sweep Mode:

### Circuit:



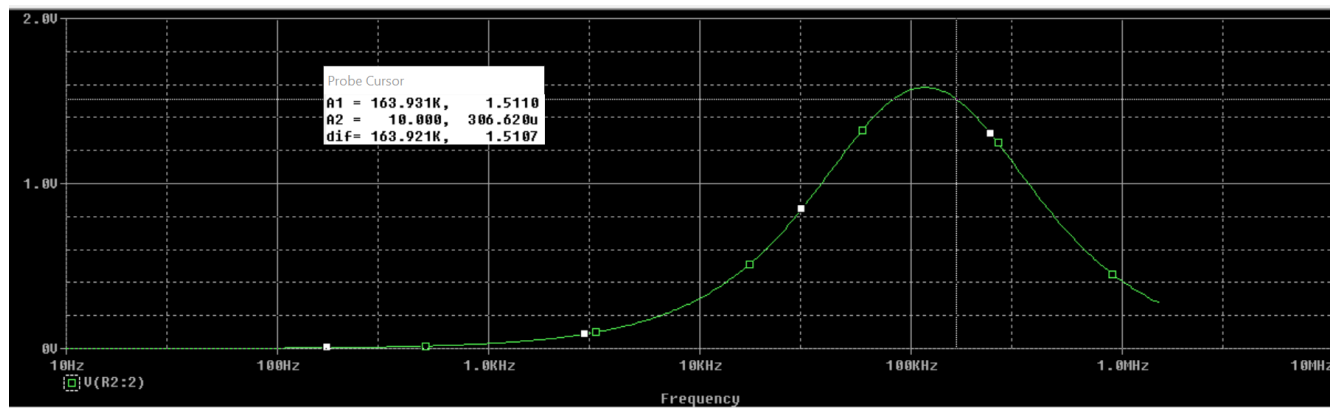
### Output Of Circuit Using AC Sweep Mode:

#### Cutoff Frequency 1:

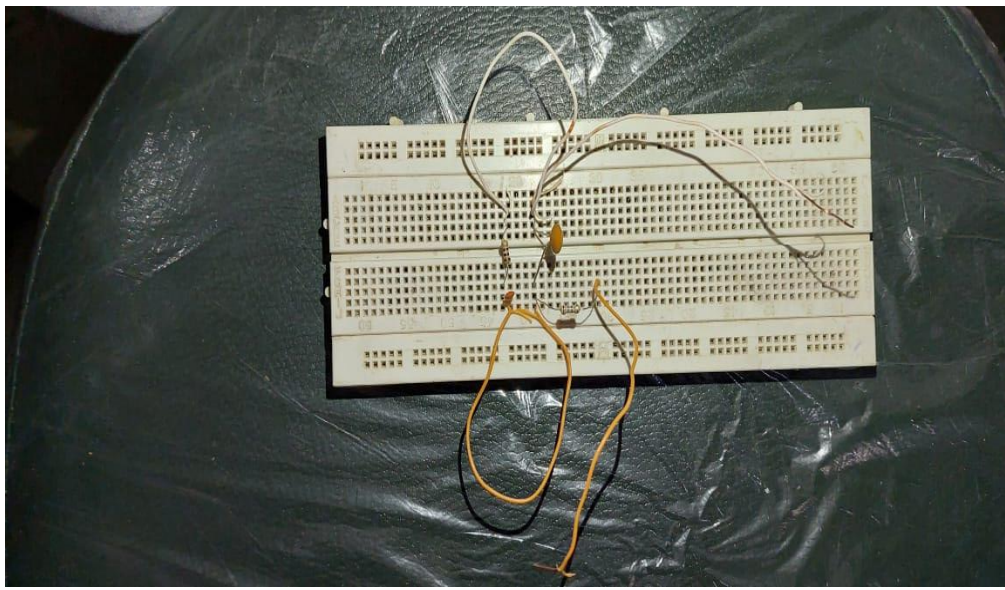




## Cutoff Frequency 2:



## Hardware Circuit:



## **Conclusion:**

In this Project , We make a Band pass filter with the combination of High pass and low pass filter and do simulation at Pspice software. After that, we make that on hardware with the help of bread board, one AC source ,two resistors and two capacitors.

- We took two constant capacitors, 0.1uF for low pass filter and 0.01uF for High pass filter.
- After that ,We calculate the values of resistors R1 and R2 by using cut of frequencies f1 and f2 respectively.
- We take f1=83k because 83 is the last two numbers of our group member. We take f2=163k because we add 83k+80=163k.
- Then we make RC circuit by using ACsin source, after this we take 80 points between two cutoff frequencies, and 10 points before and after two cutoff frequencies.
- Then find the peak voltages of all these frequency points.
- At the end, We use AC sweep source and then match all values of peak voltages in which we calculate at AC sin mode.

**The End**

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