ELECTROTECHNICH LAB.

PART 7 EXPERIMENTS

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EXPERIMENT 20.1

EXAMINATION OF ∏ TYPE LOW PASS FILTER

REQUIRED MATERIAL:

1- Function generator
2- Oscilloscope (**two channeled**)
3- Y-0016/03AC module
4- Enough connection cable

THE EXPERIMENT:

Adjust the output of function generator to sine peak to peak Epp=10V and the frequency to 1KHz. Plug the Y-0016/03AC module. Make the circuit connections as in figure 18.4

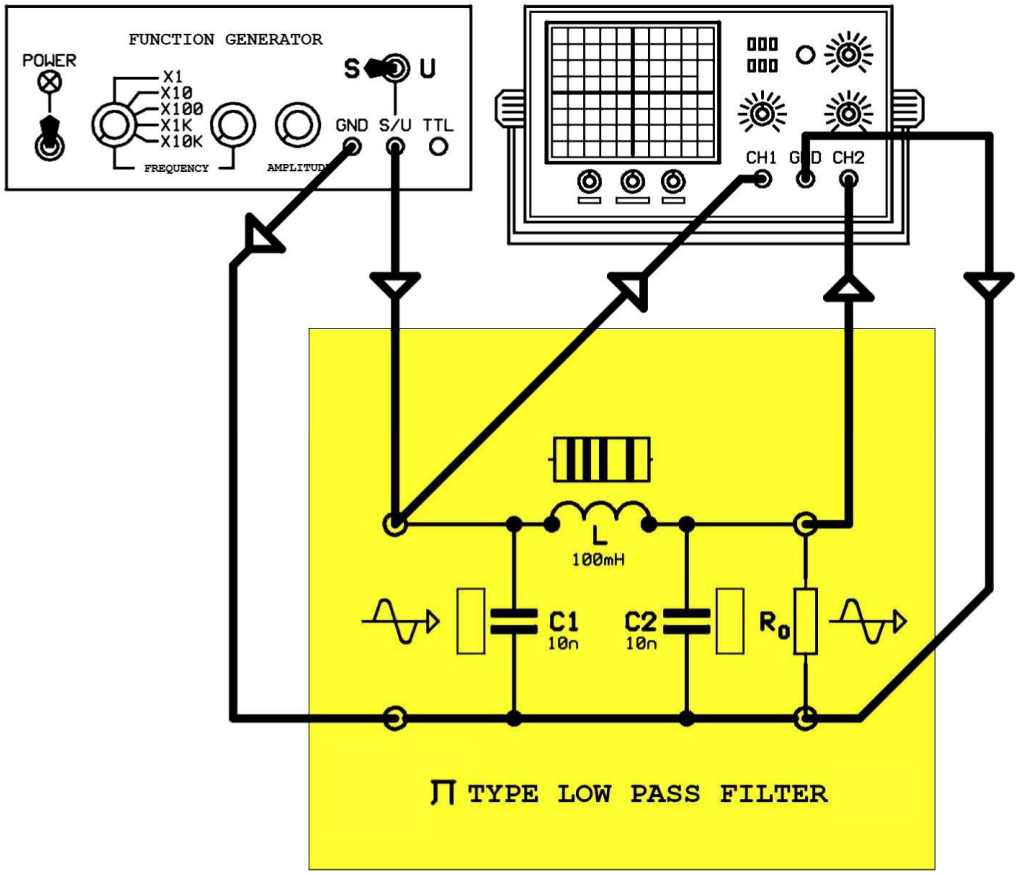

Figure 18.4

1- In the experiment L=100mH, C=10nf. Calculate the "**Ro**" resistance

$$C = C1 + C2$$

$$Ro = \sqrt{\frac{L}{2C}}$$

2- Calculate the cut-off frequency of circuit?

$$C = C1 + C2$$

$$Fc = \frac{1}{2\pi\sqrt{LC}} \Rightarrow$$

3- What does cut-off frequency denote?

4- Apply energy to the circuit. Increase the input signal frequency 1KHz each step until 10KHz. Note the output signal amplitude to a scale in each step. Especially, measure the output signal amplitude at cut-off frequency.

FREQUENCY (KHz)	**V_0 (V_{p-p})**
1,0	
2,0	
3,0	
3,5	
4,0	
4,5	
5,0	
5,5	
6,0	
7,0	
8,0	
9,0	
10,0	

Figure 18.5

5- Compare the calculated cut-off frequency and the value you measured. If there is a difference, explain why?

6- What can be said about the change in scale?

EXPERIMENT 20.2

EXAMINATION OF ∏ TYPE HIGH PASS FILTER

REQUIRED MATERIAL:

1- Function generator
2- Oscilloscope (**two channeled**)
3- Y-0016/03AC module
4- Enough connection cable

THE EXPERIMENT:

Adjust the output of function generator to sine peak to peak Epp=10V and the frequency to 1KHz. Plug the Y-0016/03AC module. Make the circuit connections as in figure 18.6

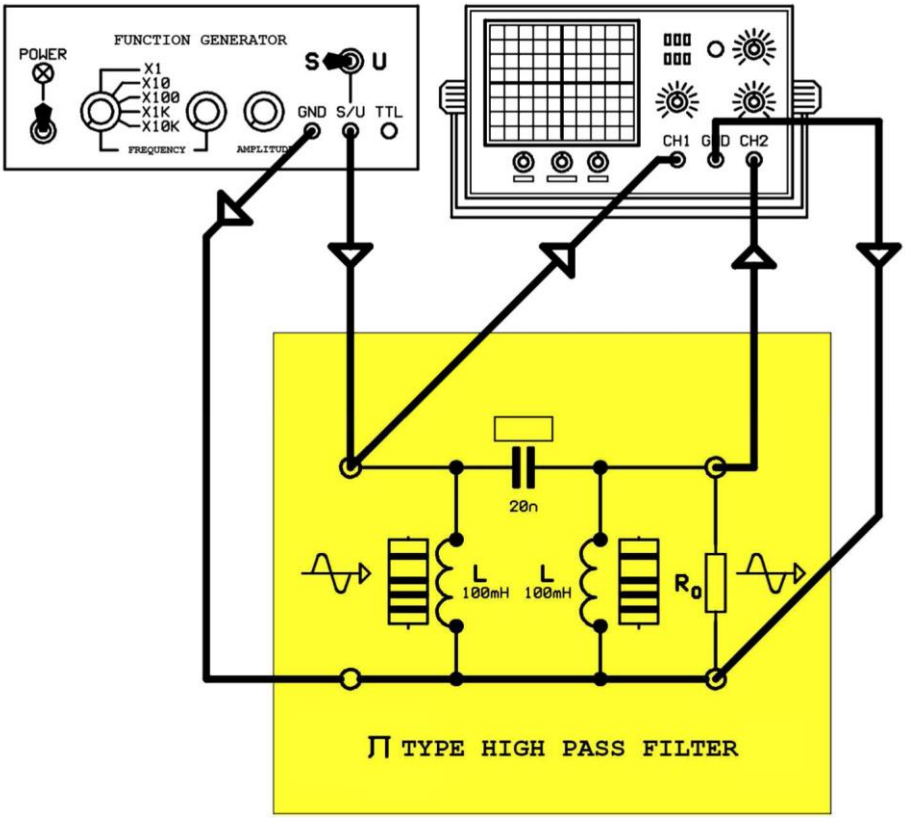

Figure 18.6

1- In the experiment L=100mH, C=20nf. Calculate the "**Ro**" resistance

$L = L1/2$ *OR* $L = L2/2$

$$Ro = \sqrt{\frac{L}{2C}}$$

2- Calculate the cut-off frequency of circuit

$L = L1 / 2$ *OR* $L = L2 / 2$

$$Fc = \frac{1}{2\pi\sqrt{LC}} \Rightarrow$$

3- What does cut-off frequency denote?

4- Apply energy to the circuit. Increase the input signal frequency 1KHz each step until 10KHz. Note the output signal amplitude to a scale in each step.

Note: In low frequencies, the circuit deforms the input signal while resisting. This is a normal situation in "**π**" type high pass filters.

FREQUENCY (KHz)	**V_0 (V_{p-p})**
1,0	
2,0	
3,0	
3,5	
4,0	
4,5	
5,0	
6,0	
7,0	
8,0	
9,0	
10,0	

Figure 18.7

5- Compare the calculated cut-off frequency and the value you measured. If there is a difference, explain why

6- What can be said about the change in scale?

EXPERIMENT 21.1

EXAMINATION OF TRANSFORMER

REQUIRED MATERIAL:

1- AC power supply
2- AC voltmeter
3- Y-0016/03AC module
4- Enough connection cable

THE EXPERIMENT:

Plug the Y-0016/03AC Module

1- Is there an electrical connection between primary and secondary windings of transformer? Measure it with an ohmmeter. Write the result

The experiment will be made on 24Volt and 12Volt in order to prevent electric shock. Make the circuit connections as in figure. Apply energy to the circuit.

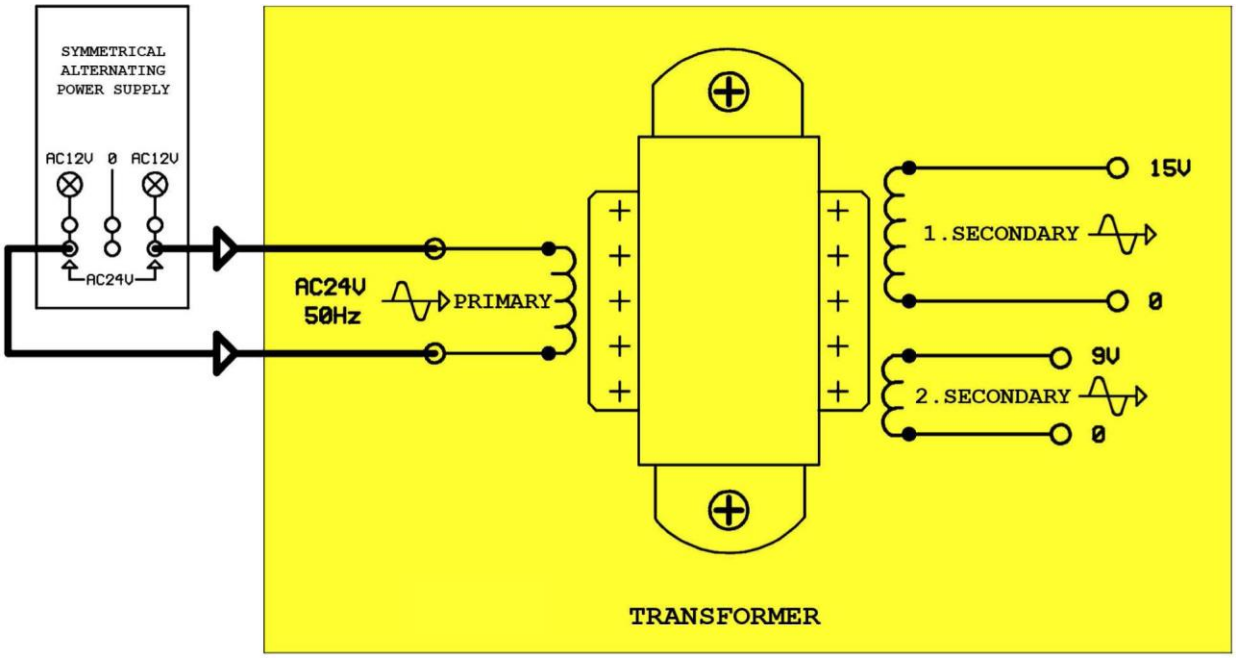

Figure 19.12

2- Calculate and write the primary and secondary voltage.

3- Apply 12Volt to the primary. Calculate and write the primary and secondary voltage.

4- How does a change of primary voltage affect the secondary voltage?
