ELECTROTECHNICH LAB.

PART 5 EXPERIMENTS

Yrd. Doç. Dr. Taha İMECİ

Arş. Gör. Ezgi YAMAÇ

Arş. Gör. Ufuk ŞANVER

İSTANBUL COMMERCE UNIVERSITY

Contents

EXPERIMENT 18.1

EXAMINATION OF RL PARALLEL AC CIRCUIT

REQUIRED MATERIAL:

1- Function Generator
2- Oscilloscope (**two channeled**)
3- three AC ampermeters
4- Y-0016/01AC module
5- Enough connection cable

THE EXPERIMENT:

Adjust the terminal of the function generator to sine, peak to peak value to **Epp=**10Volt and frequency to **F**=1KHz. Connect the Y-0016/01AC module to its place. Make the circuit connections as in the figure 16.23. Apply the power to the circuit.

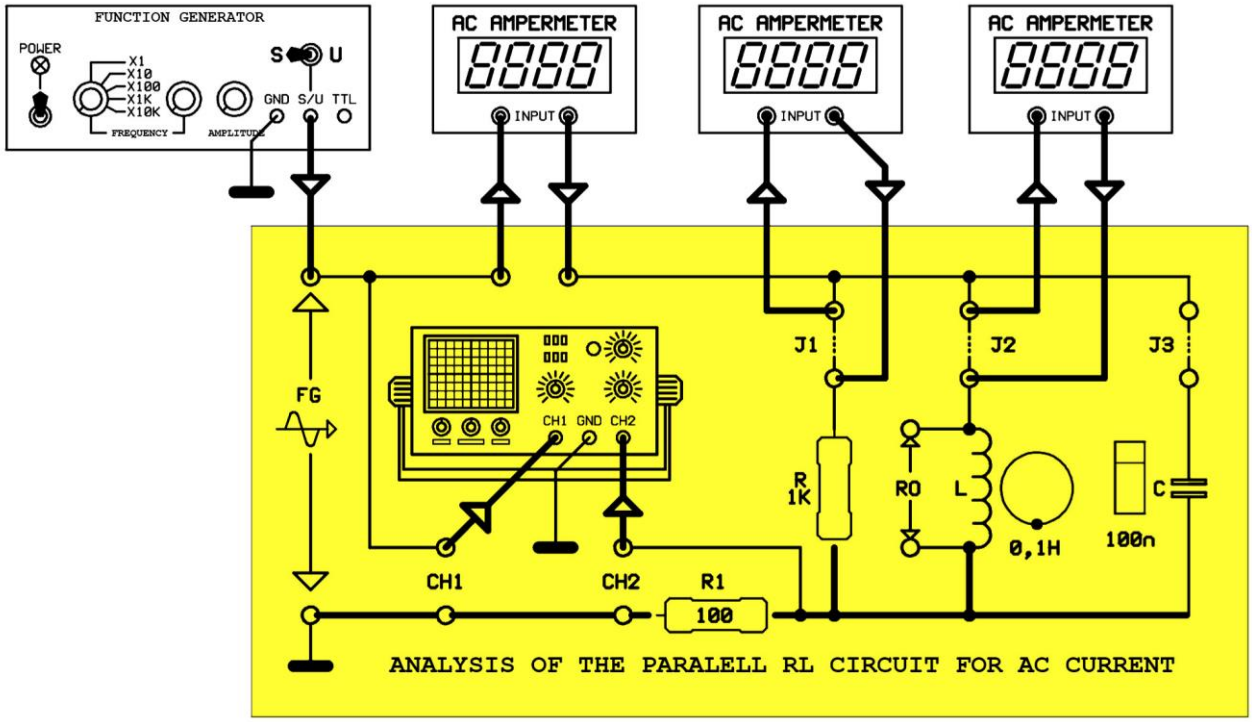

Figure 16.23

1- What can be said about the circuit looking at the vector diagram on the oscilloscope?

2- Short-circuit the CH2 points so that "**R1**" resistor will not effect the circuit.

3- Calculate the inductive reactance of the inductor

$$XL = 2\pi FL$$

4- Calculate the circuit current and currents passing through the legs of circuit.

$$IR = \frac{E}{R} =$$

$$IL = \frac{E}{XL} =$$

$$I = \sqrt{IR^2 + IL^2}$$

$$I =$$

5- Read the current values shown by Ampermeters. Compare the current values in Ampermeters with the calculated current values.

6- Draw the phasor diagram of the circuit.

Figure 16.24

7- Find the circuit impedance using the values in measurement devices.

$$Z = \frac{E}{I} =$$

8- Find the power coefficient and phase angle of the circuit.

$$Cos\varphi = \frac{IR}{I} =$$

$$\varphi =$$

9- Calculate the active power dissipated using the values in measurement devices.

$$P = E.I.Cos\varphi$$

$$P =$$

EXPERIMENT 18.2

EXAMINATION OF RC PARALLEL AC CIRCUIT

REQUIRED MATERIAL:

1- Function Generator
2- Oscilloscope (**two channeled**)
3- three AC ampermeters
4- Y-0016/01AC module
5- Enough connection cable

THE EXPERIMENT:

Adjust the terminal of the function generator to sine, peak to peak value to **Epp=**10Volt and frequency to **F**=1KHz. Connect the Y-0016/01AC module to its place. Make the circuit connections as in the figure 16.28. Apply the power to the circuit.

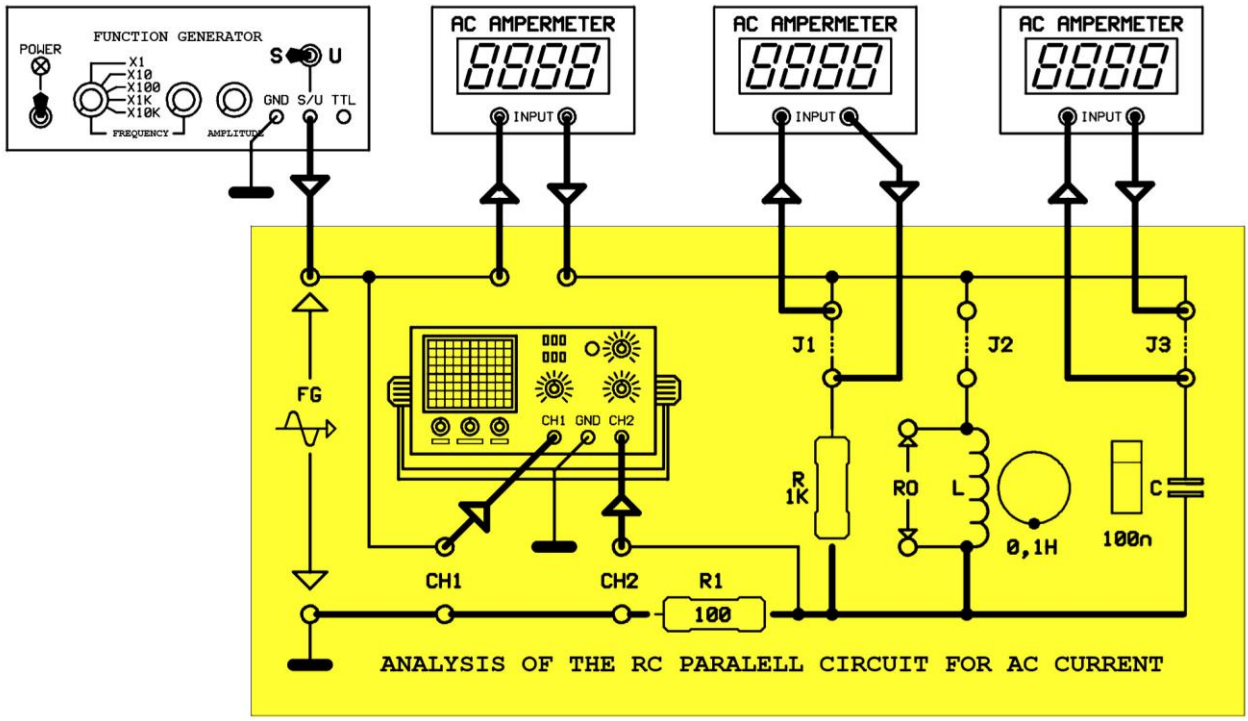

Figure 16.28

1- What can be said about the circuit looking at the vector diagram on the oscilloscope?

2- Short-circuit the CH2 points so that "**R1**" resistor will not affect the circuit.

3- Calculate the capacitive reactance of the capacitor.

$$XC = \frac{1}{2\pi FC}$$

$$XC =$$

4- Calculate the circuit current and currents passing through the legs of circuit

$$IR = \frac{E}{R} =$$

$$IL = \frac{E}{XC} =$$

$$I = \sqrt{IR^2} + IC^2$$

$$I =$$

5- Read the current values shown by Ampermeters. Compare the current values in Ampermeters with the calculated current values.

6- Draw the phasor diagram of the circuit.

Figure 16.29

7- Find the circuit impedance using the values in measurement devices.

$$Z = \frac{E}{I} =$$

8- Find the power coefficient and phase angle of the circuit

$$Cos\varphi = \frac{IR}{I} =$$

$$\varphi =$$

9- Calculate the active power dissipated

$$P = E.I.Cos\varphi$$

$$P =$$

EXPERIMENT 18.3

EXAMINATION OF RLC PARALLEL AC CIRCUIT

REQUIRED MATERIAL:

1- Function Generator
2- Four AC ampermeters
3- Y-0016/01AC module
4- Enough connection cable

THE EXPERIMENT:

Adjust the terminal of the function generator to sine, peak to peak value to **Epp=**10Volt and frequency to **F**=1KHz. Connect the Y-0016/01AC module to its place. Make the circuit connections as in the figure 16.33. Apply the power to the circuit.

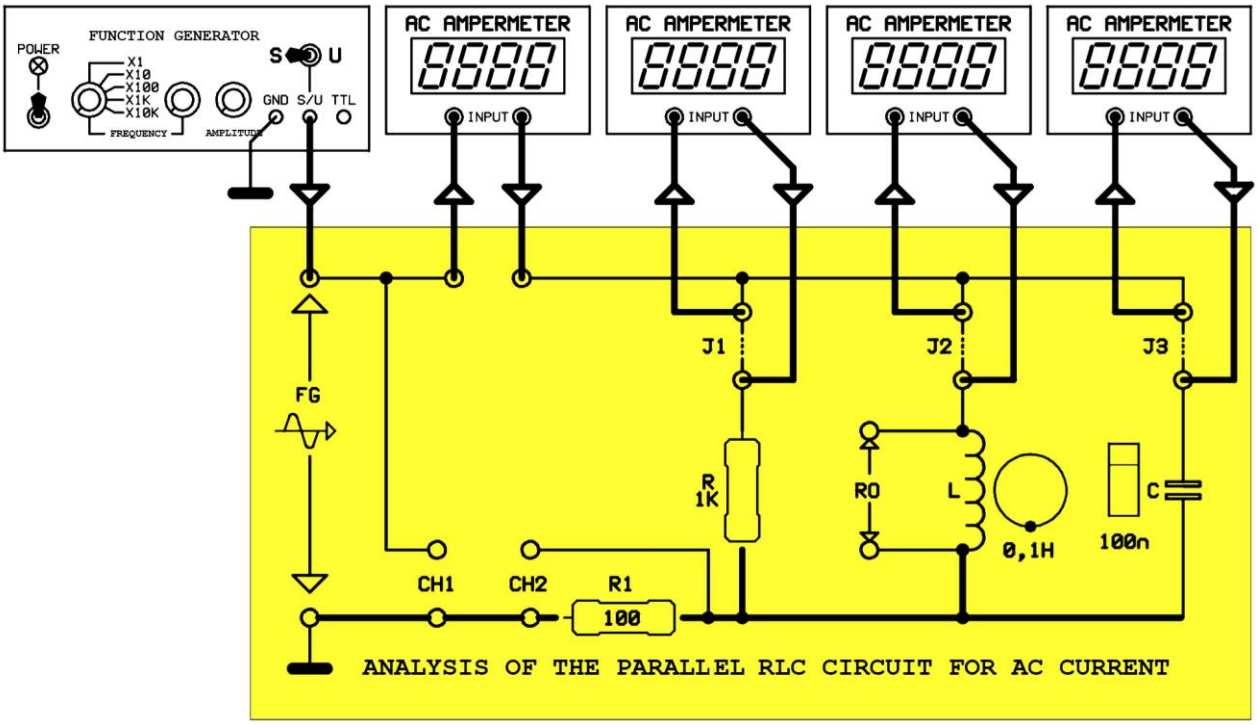

Figure 16.33

1- Short-circuit the CH2 points so that "**R1**" resistor will not affect the circuit.

2- Calculate the inductive reactance of the inductor

$$XL = 2\pi FL$$

$$XL =$$

3- Calculate the capacitive reactance of the capacitor

$$XC = \frac{1}{2\pi FC} =$$

4- Calculate the circuit current and currents passing through the legs of circuit.

$$IR = \frac{E}{R} =$$

$$IL = \frac{E}{XL} =$$

$$IC = \frac{E}{XC} =$$

$$IF = IL - IC =$$

$$I = \sqrt{IR^2 + IF^2}$$

$$I =$$

5- Read the current values shown by Ampermeters. Compare the current values in Ampermeters with the calculated current values.

6- Draw the phasor diagram of the circuit.

Figure 16.34

7- Find the circuit impedance using the values in measurement devices.

$$Z = \frac{E}{I} =$$

8- Calculate the power coefficient and the phase angle.

$$Cos\varphi = \frac{IR}{I} =$$

$$\varphi =$$

9- Find the power coefficient and phase angle of the circuit.

$$P = E.I.Cos\varphi$$

$$P =$$