ISTANBUL COMMERCE UNIVERSITY

DERPARTMENT OF ELECTRICAL-ELECTRONICS ENGINEERING

EEE202 ELECTRO-TECHNICH LABORATORY

PART 4
EXPERIMENTS

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EXPERIMENT 4.1

EXAMINATION OF RESISTANCES IN ALTERNATING CURRENT

REQUIRED MATERIALS:

1- Function generator
2- Oscilloscope (**two channels**)
3- AC ammeter
4- Y-0016/01AC module
5- Connection cable

EXPERIMENT:

In function generator, set a sin wave with 10 volts peak to peak and 1Khz frequency **Epp = 10V, f = 1Khz**. Replace the Y-0016/01AC module. Short circuit the **J1** nodes. Connect the circuit as in figure 4.1. Power the circuit.

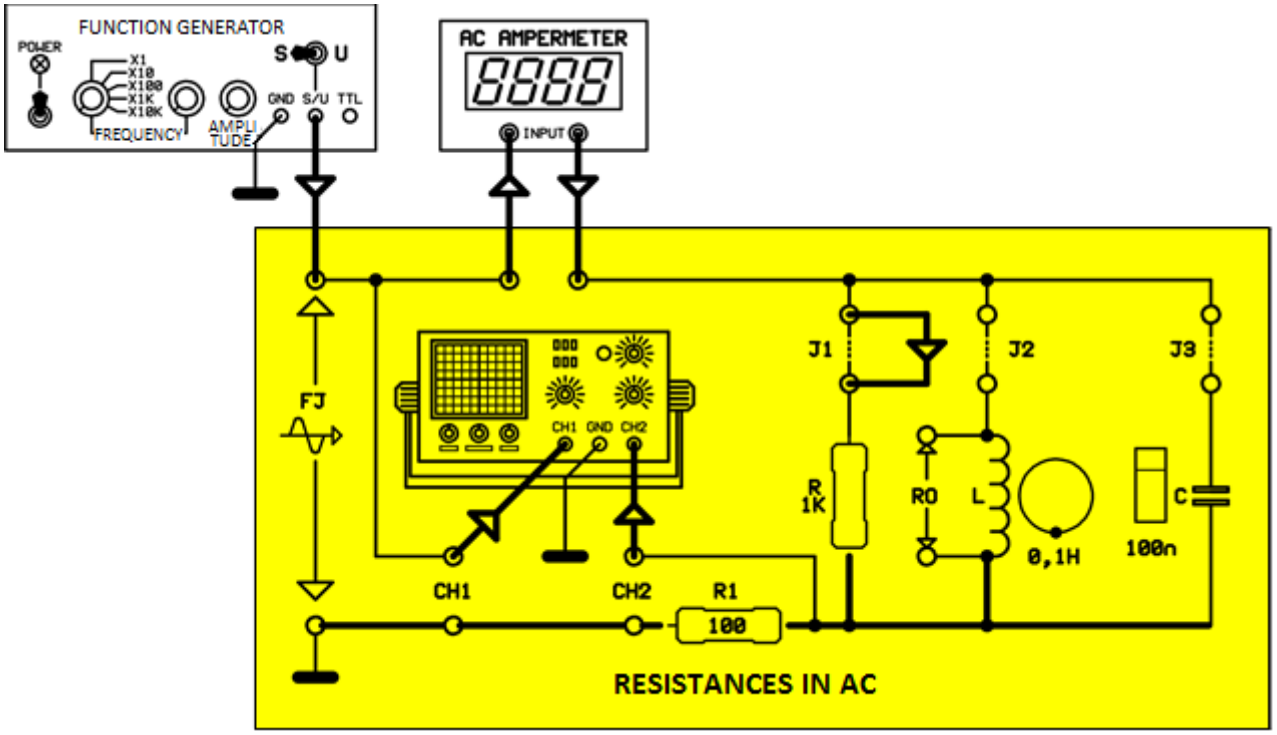

Figure 4.1

1- Plot the vector diagram of the circuit by the help of the oscilloscope.

2- What is the phase angle of the circuit? Why?

3- Calculate the current of the circuit. (**Take R1=0**).

4- Short circuit CH2. In this case R1 is omitted from the circuit. Is the value measured by ammeter equal to the value that we calculated?

5- Draw the phase diagram of the circuit?

6- Change the frequency of the circuit between 250 Hz to 750 Hz. Write down the changes in phase angle, amplitudes of voltage and current. Summarize the result.

7- What is the minimum power value of the resistance **"R"**.

NOTE: Do the experiment in different frequencies and different voltages.

EXPERIMENT 4.2

EXAMINATION OF THE CAPACITANCE IN THE AC CIRCUIT

REQUIRED MATERIALS:

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

EXPERIMENT:

Adjust the function generator output sinusoidal, peak to peak voltage 10 volts and the frequency to **F=**1 KHz. Put the Y-0016/01AC module on to its place. Make the **J3** nodes short circuit. Make the circuit connections as shown in Figure 4.2. Apply the power to the circuit.

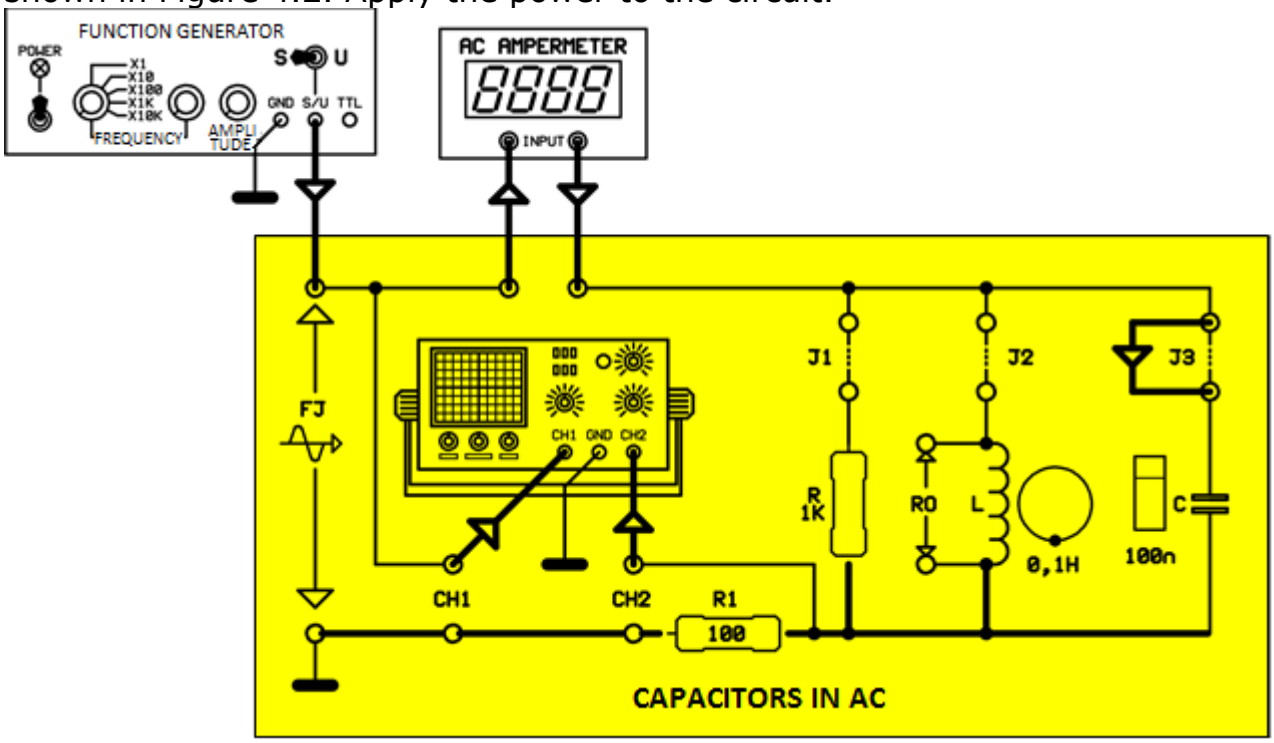

Figure 4.2

1- Plot the vector diagram of the circuit seen on the oscilloscope.

2- What is the phase angle of the circuit? Why?

3- Calculate the capacitive reactance of the capacitor.

4- Calculate the circuit current.

5- Short circuit the CH2 points. Now R1 has no effect on the circuit. Compare the current calculated and read from the ampermeter. If there is a difference explain the reason.

6- Plot phase diagram of the circuit.

7- Calculate apparent, active and reactive power of the circuit.

NOTE: Repeat the experiment for different voltage and frequency values.