

ELG2336

Expt 2: Oscilloscope and
Function Generator

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Objectives

- The main objectives of this experiment are
 - To introduce the operation of an oscilloscope as a measuring instrument
 - To introduce the functions of a signal generator
- The experiment will help the students to learn oscilloscope and function generator.

Introduction

- Let's explain the functionalities of oscilloscope and signal generator.
- Consult the lab document to follow the related theory.



Oscilloscope



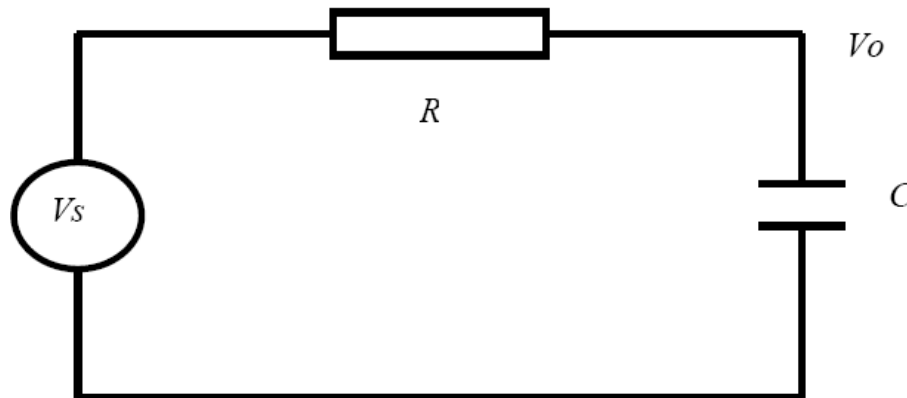
Signal generator

Equipment

- 1 voltage source
- 1 multimeter
- 1 oscilloscope
- 1 function generator (signal generator)
- 1 resistance box
- 1 μF capacitor
- Different resistors

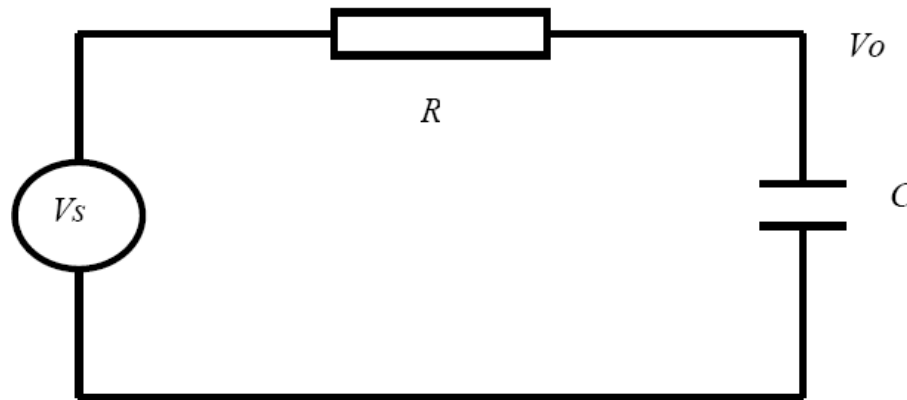
Lab Tasks

- Task 1: Measurement of voltages and currents by multimeter
 - Use only 1 resistor and 1 capacitor (RC circuit: with appropriate values). Work with frequencies in the interval 1 kHz to 10 kHz. Avoid using electrolytic capacitors in this experiment. Use ceramic capacitor.



Lab Tasks

- Task 2: Measurement of voltage amplitude and phase with oscilloscope
 - Measure the magnitude and phase of V_o if V_s is sinusoidal wave with no DC offset, $5V_{\text{peak}}$ magnitude ($10V_{\text{peak-to-peak}}$). Vary the frequency between 1 kHz and 10 kHz.



Lab Tasks

- Task 3: Current Measurement in Series Circuit
 - Find out the relationship between the voltage and current through the capacitor.
 - Verify with theoretical understanding.

Report

- Submit a report on your findings.
- Answer the following questions
 - 1) What are the advantages and disadvantages of using the oscilloscope as a voltmeter?
 - 2) Based upon the sketches of the waveforms and the measured amplitudes for the waves in the circuit, does the theory hold for the AC waveforms? Support the answer further with numerical data.

References

- ELG2336 textbook
- ELG2336 lab document available at
 - <http://www.site.uottawa.ca/~rhabash/ELG23361EXP2.pdf>
- Some of the images have been borrowed from searching through Google and the course website. Sources of the figures are acknowledged.

Thank you.

- Ask us your questions. Make sure you understand the experiment completely.

