APRIL 1TH, 2019

"MANEJO DEL OSCILOSCOPIO"

PRACTICE 4

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1CM10

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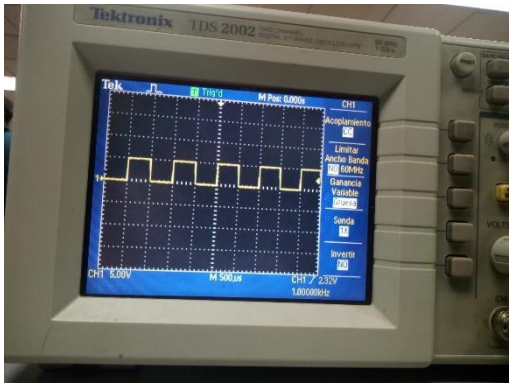
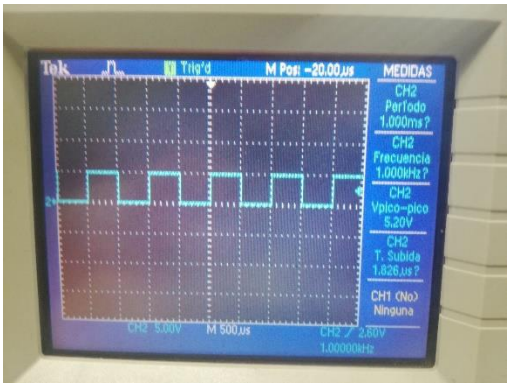
PRACTICE DEVELOPMENT

MEASURING SIGNALS OF ADJUSTMENT AT THE TEST CALIBRATION TERMINAL OF THE OSCILLOSCOPE

Energize the oscilloscope and find the screen of it (the test calibration terminal). Connect it at the Channel 1 (CH1), with oscilloscope cable, then, select a shoot font (to CH1). Adjust the controls of voltage amplitude (volts/div) and time division (time/div) to look a full cycle of the signal and report the values of amplitude and frequency below.





Period (T) can be calculated by doing this: T = [(time/div)] [(No. of horizontal divisions)]

For channel 1: $T = 1x10^{-3}$ Sec

For channel 2: $T = 1x10^{-3}$ Sec

Frequency (F) can be calculated by doing this: F = 1/T

For channel 1: $F = 1 / 1x10^{-3} = 1$ KHz

For channel 2: $F = 1 / 1x10^{-3} = 1$ KHz

Amplitude of peak-to-peak voltage can be calculated by the form:

$$V_{p-p} = [(volts/div)] [No. of vertical divisions]$$

For channel 1: $V_{p-p} = 5 * 1 = 5$ V

For channel 2: $V_{p-p} = 5 * 1 = 5$

CHECKING SIGNAL GENERATOR FUNCTIONS

Energize a signal generator, connect its output terminal to the oscilloscope input terminal (using a BNC – BNC cable). Adjust signal frequency in signal generator at 10 KHz and set amplitude at 10 V_{p-p}. Select one of the different forms of wave and fill the table below.

Function	Amplitude (Volts)	Period (Sec)	Frequency (Hz)	Signal form
Sine	11.2	100×10^{-3}	10 K	Figure 1
Triangular	11	100×10^{-3}	10 K	Figure 2
Square	11.2	100×10^{-3}	10 K	Figure 3

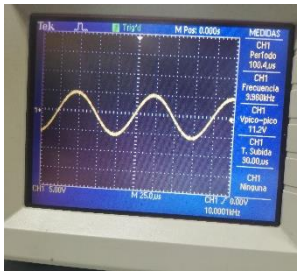


Figure 1. Sine Signal

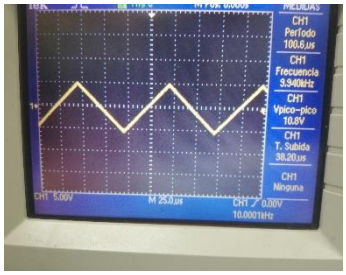


Figure 2. Triangular Signal

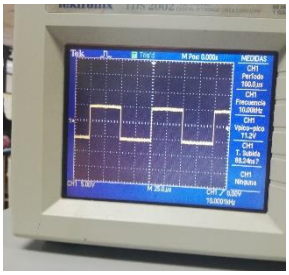
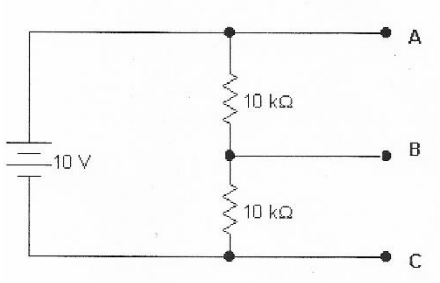


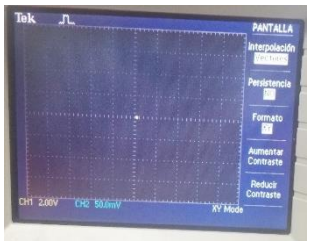
Figure 3. Square Signal

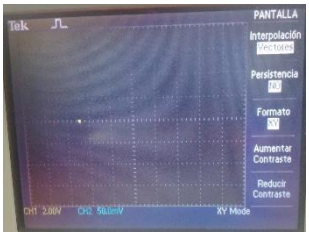
GRAPHS X-Y ON OSCILLOSCOPE, WITH DC SIGNALS

You are going to measure cartesian displacement of the electronic beam with dependency of variable polarity of DC tensions at input terminals of oscilloscope. Set mode X-Y in your oscilloscope, with both channel at GND. Use the control *position X* and *position Y* to set both strokes at the center (0 V_X, 0 V_Y).



Then, make the circuit below and using test tips of the oscilloscope connect at the points in each case. Make measures as showed in the table. Draw each result.



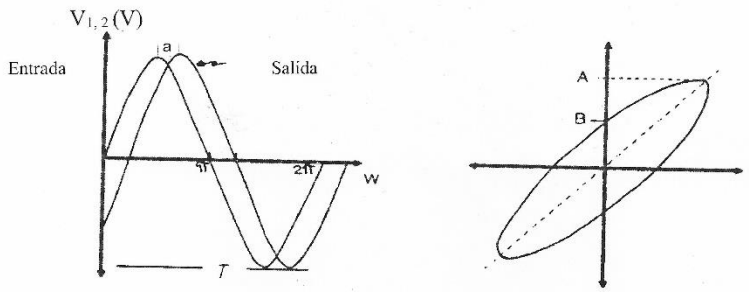


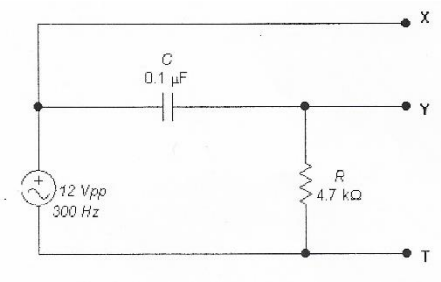
Measures to make:

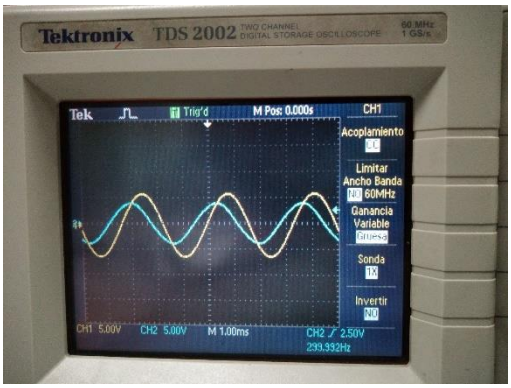
a) Positive X: point A, Negative X: point C.
b) Positive Y: point B, Negative Y: point C.
c) Positive X: point A, Positive Y: point B, Negative X and Y: point C.
d) Same as c), but with channel Y inverted.
e) Positive X: point B, Positive Y: point C, Negative X and Y: point A, channel Y inverted.

OSCILLOSCOPE AS A X-Y PLOTTER, WITH AC

You are going to measure a gap angle (Φ) between electric signals (input and output) of the RC circuit energized by a sign with type of sine. We show two methods to know the value of the angle and its equations. The first one uses a graph Y(t) and the second one uses a XY graph and it is called LISSAJOUS. You can use the division on the screen, built the next circuit and connect it at the oscilloscope. Draw each result.



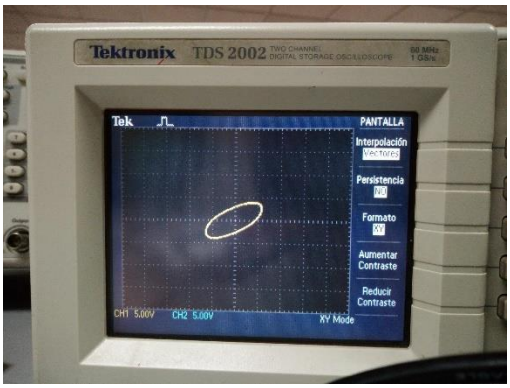




Y(t) mode

Volt/div = 5 V

Time/div = 1 mS



XY mode

Volts/div vertical = 5V

Volts/div horizontal = 5V

CONCLUSIONS

CABAÑAS BAXCAJAY JESÚS FRANCISCO

Thanks to this practice, we learned the basics of the oscilloscope, an important tool in electronics, because it is a graphic help for us that shows properties of signals (such as period, voltage, frequency, current, phase and noise), and then, it's easiest for us to work with our circuits.

HERNÁNDEZ VELÁZQUEZ ÁNGEL

The oscilloscope is a very important tool that helps us appreciate the behavior of alternating current. Within it we can observe values such as the peak-peak voltage value, in addition to its period and other things. There are other modalities that allow us to form things in an XY plane, in addition two or more currents can be analyzed depending on the model of it.

MARTÍNEZ CORONEL BRAYAN YOSAFAT

One of the most important things of our life is to know how to represent every thing in our environment, so knowing how electricity works it is not enough to use it, we need math to make it better, because math is in everything, we are math, and oscilloscope bring us a part of this math, but with the energy, it is obvious that by knowing how oscilloscope works we can do any property of math, but applied to energy. That is why oscilloscope is so important.

CALCULATIONS

There were no calculations for this practice

SIMULATIONS

There were no simulations for this practice

INSTITUTO POLITÉCNICO NACIONAL

ESCUELA SUPERIOR DE CÓMPUTO

LABORATORIO DE ANÁLISIS FUNDAMENTAL DE CIRCUITOS

PRÁCTICA No. 4

"MANEJO DEL OSCILOSCOPIO"

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25/03/19

GRUPO: 1CM10

EQUIPO: 10

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FECHA DE ENTREGA: _____

COMENTARIOS:

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