P1320L, Oscilloscopes
Lab 2, Work Sheet

Submitted by: Mari Beltran Experiment's date: 08/28

Team members:

1.- Eliza 2.- _____

3.- _____ 4.- _____

Instructor must initial:_____

Introduction

Read your manual carefully and feel free to ask your instructor if you need help. Make sure to label the scale on each graph. Straight-edges are available to help you make good sketches.

Write a short paragraph about the purpose of this lab.

Data

Instructions: Collect your data using your lab manual as a guide, unless directed to do otherwise by your lab instructor. Each measurement must have units. If a table is used, then it must have headers (for rows or columns) that include units

1 Data

1.1 Calibration and Setup

1. Sketch the calibration signal. Measure and record its period and peak-to-peak (p-p) amplitude. The plot axes must include labels with appropriate SI units.

1.2 Synthetic Signals

2. Set the signal generator Channel 1 to produce a sinusoidal wave with the parameters given by your instructor. Feed this signal to the Oscilloscope's Channel 1. Adjust the oscilloscope so the signal is centered on the screen, and measure its period and amplitude. Record your values along with the TIME/DIV and VOLTS/DIV settings used for the measurements.

Set frequency → 1 kHz

Set amplitude → $2V_{pp}$

$\Delta t = T =$ 992 μm (microseconds) Time / Div = 200 μs

$\Delta V =$ 2.04 V Volt / Div = 500mV

3. Sketch the graph, indicating the measured values. The plot axes must include labels with appropriate SI units.

4. Set signal generator Channel 2 with the same parameters as those used for Channel 1, but set the phase constant to 75 degrees. Feed this signal to the oscilloscope's

Set frequency → 1 kHz

set amplitude → $2V_{pp}$

phase start → 75°

Channel 2. Adjust the oscilloscope so both signals are centered on the screen, and measure their time difference. Record its value.

$\Delta t = 211 \mu s$ (microseconds)

1.3 Frequency of a Tuning Fork

5. Record the frequency printed on the tuning fork.

512 Hz (C)

6. Measure on the oscilloscope the tuning fork's Period; record its value. Hint: To get a cleaner trace, you can change the acquisition mode to sample. Once you are satisfied with the trace, use the stop button to freeze the image before measuring.

$T = 1.97 ms$ (milliseconds)

2 Analysis

2.1 Synthetic Signals

7. Calculate the frequency for the signal on Channel 1 and compare it to the nominal frequency displayed on the signal generator.

8. From the time difference between the signals on Channels 1 and 2, determine the actual phase constant for the signal on Channel 2 and compare it to its nominal value.

2.2 Frequency of a Tuning Fork

9. From the period measured, determine the frequency of the tuning fork.

10. Calculate the percentage error between the measured frequency and the frequency listed on the tuning fork.