



University *of* Idaho

CLASS

LAB NUMBER EX (LAB 1) - LAB TITLE

DATE

Submitted By:
Author

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1 Introduction

The first sentence should state the objective of the lab, research, or investigation. 3-6 more sentences should follow to briefly overview any background information, explain auxiliary objectives, and summarize the general procedure. Avoid using pronouns like “I, We, He, She”. Professional reports should be written almost exclusively in third person.

Paragraphs that are separated by a line of horizontal space do not need to be indented.

2 Procedure

This may be either a paragraph or a list that paraphrases the procedure from the lab handout. Do not copy and paste or otherwise plagiarize the lab handout. Obviously, there are only so many ways that “Set V_p to 4V” can be phrased - so just use your best judgment.

3 Calculations

Include the calculations you used in the lab here. The calculations need to be formatted in a way like so:

$$T = \frac{1}{f} = \frac{1}{1000} = 0.001 \text{ s}$$

When doing the same calculation for multiple data points (i.e. percent error calculations), do not show each calculation. It is appropriate to include only the equation.

4 Data

Include completed tables from the lab handout here. Tables need to be readable (if an image, just make sure the image is high enough resolution).

Table 3.1 - Measurement Table Example

Potential	Measured			Calculated			Percent Error		
	Magnitude (O-scope)	RMS (DMM)	Phase Angle (leading or lagging)	Magnitude Eq (2)	RMS (From Prelab)	Phase Angle (From Prelab)	Magnitude Eq (3)	RMS Eq (3)	Phase Angle Eq (3)
Node 1	4.24 V	3.04 V _{RMS}	0 °	4.30 V	3.00 V _{RMS}	0 °	1.4 %	1.33 %	0 %
Node 2	4.56 V	3.2 V _{RMS}	6.048 ° Lagging	4.54 V	3.21 V _{RMS}	6.8 ° Lagging	0.4 %	0.3 %	11.1 %
Node 3	3.52 V	2.48 V _{RMS}	27.65 ° Leading	3.48 V	2.46 V _{RMS}	26.03 ° Leading	1.15 %	0.8 %	6.2 %
Voltage Across C (V _C)	560 mV	.400 V _{RMS}	114.05° Leading	0.600 V	0.426 V _{RMS}	116 ° Leading	6.7 %	6.1 %	1.7 %
Voltage Across L (V _L)	2.64 V	1.76 V _{RMS}	53.57 ° Lagging	2.47 V	1.75 V _{RMS}	56.4 °	6.9 %	0.57 %	5.0 %
Current	2.08 mA	1.47 mA _{RMS}	26.03 Leading	.0022 A	.00154 A _{RMS}	26.03 Leading	5.4 %	4.5 %	0 %

5 Questions

Include each lab handout question and write your response below it:

1. "What is the answer to this question"
 - (a) The answer to this question is —
2. "What is the answer to this question"
 - (a) The answer to this question is —

6 Conclusion

Summarize your findings in 2-4 sentences and state an overall conclusion for what was accomplished (or not accomplished) in lab. If you encountered significant error, explain what you think may have caused it.

If you do the lab report in latex, you can use the template provided, you will get 2 points back on your report back. You can not go above 10 points, but if you loose points you will get 2 points back.

7 Code

If you used any python code, you would add it to the report here.

Example of code in report:

example_program.py

```
1 import numpy as np
2 import matplotlib.pyplot as plt
3
4 # Define Variables
5 steps = 0.1 # Step size
6 x = np.arange(-2,2+steps,steps) # notice the final value is
7                                # '2+steps' to include '2'
8                                # this sets up x. steps is
9                                # unlike pure maths,
10                               # computers need exact points to calulate
11                               # what this function is
12                               # basically doing is creating points spaced .1 away from each
13                               # other
14                               # starting at -2 to 2
15 print(f"What x looks like if printed out the data:{x}") # f
16                               # stands for formatted string, you can variables into a
17                               # string like here
18 y1 = x + 2
19 y2 = x**2
```

```
15
16 # Code for plots
17 plt.figure(figsize=(12,8)) # Start a new figure, with
18                             # a custom figure size
19 plt.subplot(3,1,1) # Subplot 1: Subplot format(row, colum,
    number)
20 plt.plot(x,y1) # Choosing plot variable for x and y axis
21 plt.title('Sample Plots for Lab 3') # Title for entire figure
22                                     # (All three subplots)
23 plt.ylabel('Subplot 1') # label for subplot 1
24 plt.grid(True) # Show grid on plot
25
26 plt.subplot(3,1,2) # Subplot 2
27 plt.plot(x,y2)
28 plt.ylabel('Subplot 2') # Label for subplot 2
29 plt.grid(which='both') # Use major and minor grids
30                         # (Minor grids not available since
    plot is small)
31 plt.xlim(-2,2) # set x and y limits
32 plt.ylim(0,4)
33
34 plt.subplot(3,1,3) # subplot 3
35 plt.plot(x,y1,'--r', label='y')
36 plt.plot(x,y2,'o',label='y2') # plotting both functions on
    one plot, 'o' gives the dot line format
37 plt.axis([-2.5, 2.5, -0.5, 4.5]) # define axis
38 plt.grid(True)
39 plt.legend(loc='lower right') # prints a legend on the plot
40 plt.xlabel('x') #x-axis label for all three subplots (entire
    figure)
41 plt.ylabel('Subplot 3') # label for subplot 3
42 plt.show() # This MUST be included to view your plots!!!
```
