Experiment 6 Writeup

Graded

Student

Julia Laine

Total Points

81 / 125 pts

Question 1

Task 1

56 / 60 pts

- **– 0 pts** Correct
- **– 2 pts** Objective

Table 1

- **– 2 pts** Units
- **– 2 pts** RMS V
- **– 2 pts** Freq

Table 2

- **– 3 pts** Units
- **– 2 pts** AC RMS V
- **– 2 pts** DC RMS V
- ✔ **– 2 pts** Measured RMS V
- **– 2 pts** Percent Error

- **– 4 pts** Explanation

Figure 1

- **– 4 pts** Persistence
- **– 4 pts** Coupling
- **– 4 pts** Measurements

Table 3

- **– 2 pts** Units
- **– 2 pts** RMS V
- **– 2 pts** Freq.

Table 4

- **– 3 pts** Units
- **– 2 pts** AC RMS V
- **– 2 pts** DC RMS V
- **– 2 pts** Measured RMS V
- **– 2 pts** Percent Error

Figure 2

– 4 pts Persistence

– 4 pts Coupling

– 4 pts Measurements

✔ – 2 pts Conclusion

1 should be AC RMS

Question 2

Task 2 25 / 40 pts

– 0 pts Correct

– 2 pts Objective

✔ – 2 pts Schematic

– 6 pts Figure 4

– 6 pts Figure 5

– 6 pts Figure 6

10.3

✔ – 5 pts Measured Power

✔ – 5 pts Calculated Power

✔ – 3 pts Percent Error

– 2 pts Conclusion

2 this needs to be computer generated, not hand drawn

3 what's are the power values?

Question 3

Bonus 1 0 / 10 pts

– 0 pts Correct

✔ – 10 pts Insufficient/Incomplete

Question 4

Bonus 2 0 / 15 pts

– 0 pts Correct

✔ – 15 pts Insufficient/Incomplete

Question assigned to the following page: 1

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Lab partner(s):

Date:10/19/2023
Lab No./Title:6
Section #(GTA):002

Instructions

- ***Submission must contain only original, individual, and current work.***
- ***After completion, save as PDF before submitting.***

Task 6.9: Measuring RMS Values

Objective:

The objective of this lab is to get familiar with the function generator and show how you manipulate waveforms.

Results/Calculations:

Step 2:

Table I: RMS voltage of triangle wave

RMS Voltage [V]	1.7327
Frequency [kHz]	**1**

Step 3:

Table III: calculated vs measured RMS voltage of triangle wave

Calculated AC RMS Voltage [V]	**1.732**
Calculated DC RMS Voltage [V]	**2**
Measured RMS Voltage [V]	**2.01**
Percent Error (AC)	**0.115%**
Percent Error (DC)	**.5%**

My calculated RMS value was close for both AC and DC RMS. They agree with the prelab calculations. The DMM measures both.

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Step 8:

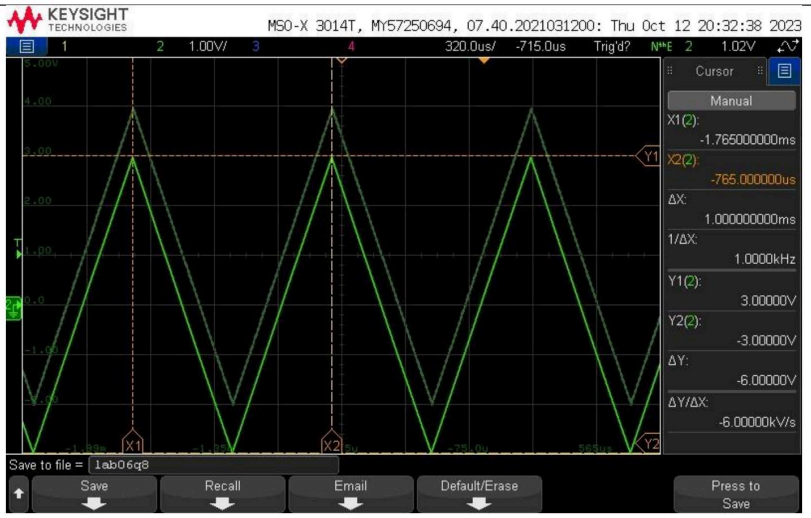

Figure I: DC and AC coupled signal of triangle wave

Step 9:

9.2 repeat for sine:

Table IIIII: RMS voltage of sin wave

RMS Voltage [V]	**1.413**
Frequency [kHz]	1

9.3 repeat for sine:

Table IVV: calculated vs measured RMS voltage of triangle wave

Calculated AC RMS Voltage [V]	**1.4142**
Calculated DC RMS Voltage [V]	**4.246**
Measured RMS Voltage [V]	**1**.413
Percent Error (AC)	**.21%**
Percent Error (DC)	**5%**

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9.8 repeat for sine:

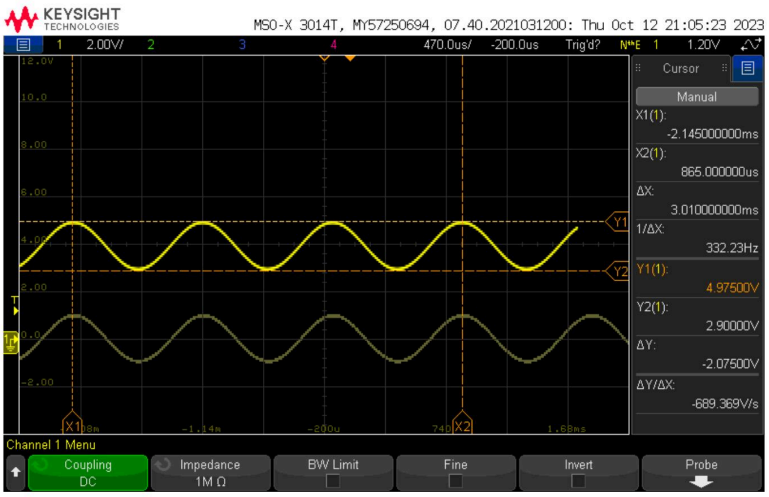

Figure II: DC and AC coupled signal of sin wave

Conclusion:

This lab experiment has proven my prelab calculations. My calculations were correct.

Question assigned to the following page: 2

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Task 6.10: Superposition of Waves

Objective:

The objective of this portion is to show us how to use more functions within the oscilloscope and overlay old waves with current waves.

Circuit Schematic(s):

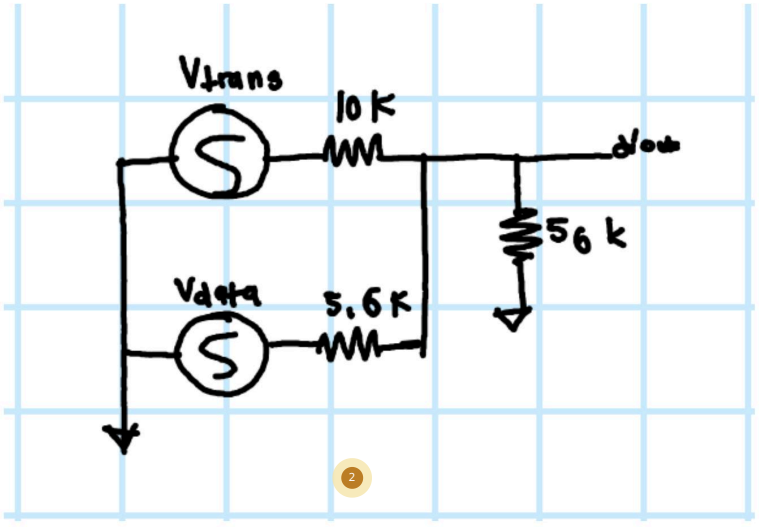

Figure III: Schematic for the data and trans circuit

Question assigned to the following page: 2

Step 2:

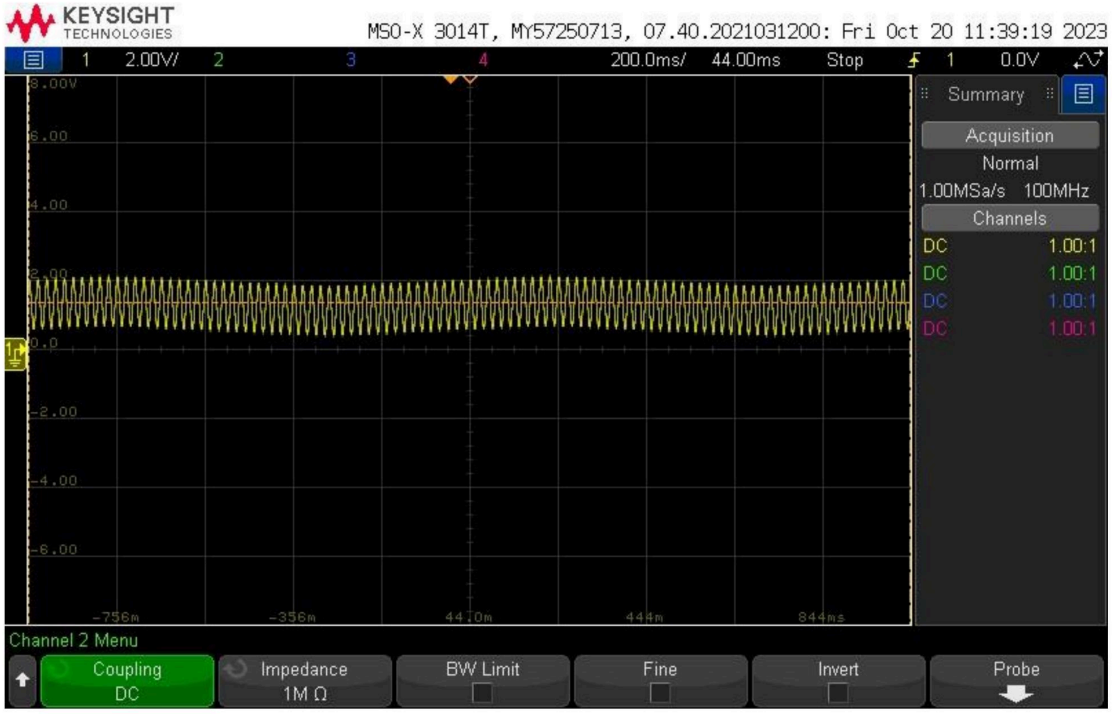

Figure IV: v out wave

Question assigned to the following page: 2

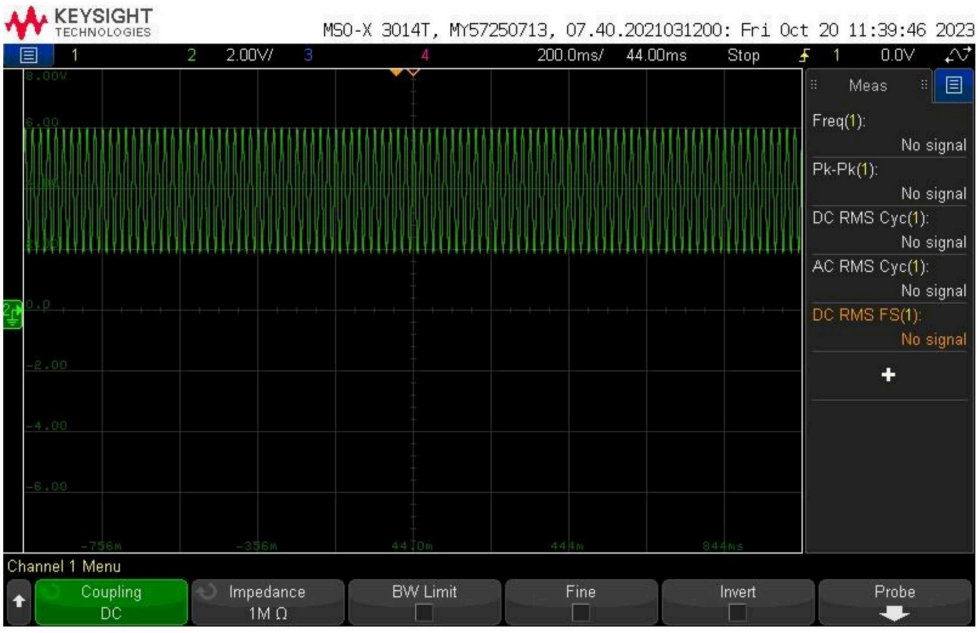

Figure V: trans sin wave

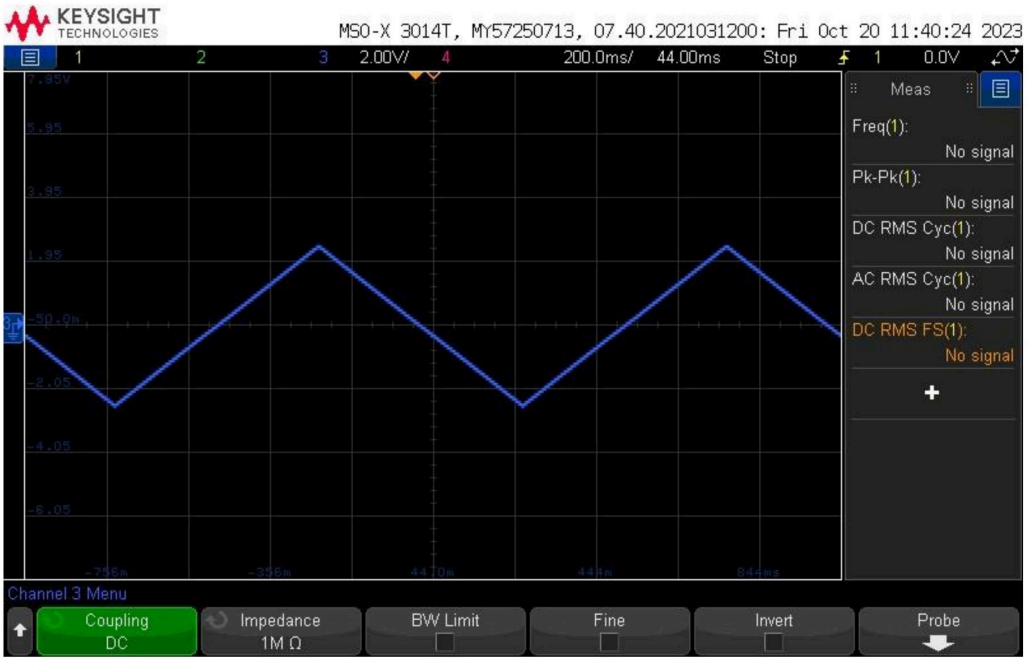

Figure VI: data triangle wave

Question assigned to the following page: 2

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Step 3:

Image of all signals. The oscilloscope says the Vout DC RMS is 1.38V. The power loss is very high (over 90%)

Conclusion:

This graph matches my graph from the prelab. There was a high power loss like I calculated (90%) and this experiment confirms my calculations from earlier.