Practical Submission Sheet

Term: 2021-1   Submission Date: 7th August, 2020
Lecture date: 7th August, 2020   Practical Number: 01
Course Code: PHY249   Section: G2903
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1. Concepts Learnt:
I learnt what a cathode ray oscilloscope is and how it operates. How it amplifies the signal vertically (to increase amplitude) and horizontally (to increase strength) and how an electron gun is used to produce the plots. Finally I learnt how to interpret the output of CRO to make meaningful observations.

2. Key observations:
Frequency and voltage of three different types of waves were measured and have been reported in section 4. The voltage was measured with full accuracy in all cases, while the frequency was measured with relative errors of 3.85%, 0.8% and 2% for the sine, triangular and pulsed waves, respectively.

3. Applications:
CROs can be used to measure voltage signals and can be useful for measuring the frequency and amplitude of AC voltage, as well as ampltidue of DC voltage. They can be particularly useful for testing an electronics circuit we're designing.

4. Report:

Sine wave

V_{pp}	V_m	V_{rms}	T	f	$|\Delta f|$
4*2 = 8V	4V	2.82	5.2 ms	192.3 Hz	7.7Hz

Input Voltage: 4V
The expected frequency was 200Hz

V_{rms} is calculated as follows:
$$V_{rms} = 0.707V_m$$

Error Analysis:
Absolute error in frequency = 200-192.3 Hz = 7.7Hz
Relative error = (7.7/200)*100 = 3.85%

Triangular wave

V_{pp}	V_m	V_{rms}	T	f	$|\Delta f|$

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6*2 = 12V	6V	4.24	6.2ms	161.3 Hz	1.3

Input Voltage: 6V
Expected frequency = 160Hz

Error Analysis:
Absolute error in frequency = 1.3 Hz
Relative error = 100*(1.3/160) = 0.8%

Square Pulse

V_{pp}	V_m	V_{rms}	T	f	$|\Delta f|$
6*2=12V	6V	4.24	4.9*2= 9.8	102	2

Input voltage: 6V
Expected Frequency: 100Hz

Error Analysis
Absolute error in frequency = 2 Hz
Relative error = 100*(2/100) = 2%