General Physics Laboratory I

Week 09: Report Guideline

Experiment 8. RLC Circuits

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General Report Guideline

1. You can use either Korean or English.
2. I suggest you to write a report with a language with which you can write rigorously. (There is no need to be shy about writing in Korean)
3. However, do not mix two languages. (ex: newton's law는 다음과 같이… → X)
4. No more than 5 pages. The font size must be greater than 9 pts.
5. Only *.doc, *.docx, *.hwp extensions are allowed.
6. Do not make a cover page.
7. **Do not repeat the details in the manual.**
8. Make the report simple but it should contain rigorous answers. / **You should merge different data in one plot.**
9. **If you suggest the origin of the error, please show your systematic justification. (No explanation → No points)**
10. You have to cite every source of theory and information beyond the manual.
11. Clarify a theme and a purpose of each part.

8. RLC Circuits

1. Abstract (5pts, < 300 words)
2. Introduction (10pts): Show your conceptual understanding about the subject.
3. Theoretical Background (10pts)
   - ✓ (5pts) Give general relationship between voltage and current in R-L and R-C circuits. Also explain a phase difference between quantities.
   - ✓ (5pts) Give a general differential equation of voltage and current in a L-C circuit. Also show general solution for the equation.
4. Methods (5pts): Draw each circuit as a diagram and give R, L, C values on the diagram.
5. Results (20pts)
   - ✓ (5pts) RL Circuit: Plot (V_0, I_0)-(time) graphs. Find a phase difference between them.
   - ✓ (5pts) RL Circuit: Plot (V_R, V_L)-(time) graphs. Find a phase difference between them.
   - ✓ (5pts) RLC Circuit: Plot (V_R, V_L, V_C, V_0, I_0)-(time) graphs.
   - ✓ (5pts) RLC Circuit: Find an amplitude of total impedance and phase differences between them.
   - ✓ Each graph should include **the axis labels**. When you introduce trendlines, you should show **equations and R square values**.
6. Discussion (30pts)
   - ✓ (10pts) RL Circuit: Discuss the reason if the phase difference is not exactly 90 degrees. (V_R, V_L) Suggest your theory and estimate an error.
   - ✓ (10pts) RLC Circuit: Discuss the reason if the phase difference is not exactly 90 degrees. (V_R, V_L) Suggest your theory and estimate an error.
   - ✓ (10pts) RLC Circuit: Confirm whether the frequency of RLC circuit is set to the resonance.
   - ✓ (Additional) Discuss about your own question and analysis.
7. Conclusion (10pts): Summarize the report effectively.
8. References (10pts)