General Physics Laboratory I

Week 07: Report Guideline

Experiment 7. Heat Engine Cycle

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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.

7. Heat Engine Cycle

1. Abstract (5pts, < 300 words)
2. Introduction (10pts): Show your conceptual understanding about the subject.
3. Theoretical Background (10pts)
   - ✓ (5pts) Explain the Carnot cycle with a Pressure-Volume (PV) diagram.
   - ✓ (5pts) Give general equations of the Carnot cycle. (PV diagram lines, efficiency)
4. Methods (5pts)
5. Results (20pts)
   - ✓ (5pts) Plot the PV diagram.
   - ✓ (5pts) Identify the edges of experimental PV diagram using the PV diagram in the theoretical background.
   - ✓ (5pts) Calculate the efficiency of the experimental cycle and the work done by the cycle. $W = mg\Delta h$
   - ✓ (5pts) Plot the t vs P and t vs V graphs.
   - ✓ Each graph should include **the axis labels**. When you introduce trendlines, you should show **equations and R square values**.
6. Discussion (30pts)
   - ✓ (5pts) Calculate ideal efficiency of the Carnot cycle with experimental parameters. (5pts) How much is the error?
   - ✓ (5pts) Calculate ideal work of the Carnot cycle (5pts) How much is the error?
   - ✓ (10pts) Describe possible error mechanisms and justify it systematically.
   - ✓ (Additional) Discuss about your own question and analysis.
7. Conclusion (10pts): Summarize the report effectively.
8. References (10pts)