On this test I worked toward a few different course objectives. However, the main two were developing an intuitive understanding of how to apply the first and the second law of thermodynamics to different thermal systems and applying thermodynamics laws to gas turbines Engines using ideal cycles, reheating regeneration, and inter-cooling cycles. Each of these course objectives were used in different problems. The first course objective stated above was used on question one which was about solar energy and finding different efficiencies and effectiveness when given different variables throughout the system. The second course objective stated above was used on question two which was about a turbojet and trying to find the pressure, speed, and thrust of different parts of it given different variables.

When comparing my solutions to the provided solutions I find that my answers line up very nicely on question one, but on question two my answers are way off. On question one the only answer that is different is part c, which even then I believe it to be a difference in temperatures that lead to the difference. Even so the two answers are relatively close even with the difference in temperatures. For question two I was very close in my methods but was off by a few different things leading me to have vastly different numbers. If I was taking this test again, I would tell myself to focus more on question two because on question one I got most of it and focused more on that one, but with question two I was tired after doing question one and did not focus as much which led to mistakes being made.

The biggest issue I encountered during the test was realizing too late that I had to rewrite and formally organize all my work. At first, I worked through the problems without focusing on presentation. Once I understood the expectations in the rubric, I had to go back and rewrite everything, which took additional time and effort. To address this, I carefully reviewed the rubric and reorganized my work to ensure it met all requirements. The steps I took to complete the test involved working through each question individually, solving the problems as I went. However, I didn't manage my time as well as I could have. I worked straight through the test without taking any breaks, which affected my work quality, especially on question two. If I were to retake the test, I would schedule short breaks between sections to maintain better focus and energy throughout the process. Throughout the test, I learned how to more effectively gather and organize variables, which is something I had struggled with in previous homework assignments. I also gained a stronger understanding of applying formulas in a structured and logical manner. These skills are essential for this class and have broader applications in engineering. The concepts covered in the test are used widely in the engineering field. For example, when designing solar-powered systems or working on jet propulsion technology, engineers must understand energy flow, thermodynamics, and system performance—skills tested here. I see myself using what I've learned in future engineering roles, especially those involving mechanical or aerospace systems, where energy transfer and fluid dynamics are essential. This learning is vital for my professional career. While I may not use these exact equations every day, how this test pushed me to think critically and organize my problem-solving will be valuable no matter where I work. If I'm ever tasked with designing or analyzing physical systems, the skills from this class will directly apply. Although I haven't had the chance to apply these concepts in my current tennis facility job, I expect to use them in future courses or engineering internships. One of the areas where I saw personal improvement was in how I collected and tracked variables

more effectively. Compared to my earlier assignments, I was more confident and organized during the test. This course's content aligns well with my future field, especially if I enter mechanical or aerospace engineering. The test covered core ideas like thermodynamic efficiency and energy balances, central to many engineering roles. I spent several hours completing the test, but didn't pace myself well. Next time, I would break the test into timed sections and allow for short breaks. That change would help me stay mentally fresh and improve the quality of my responses across the entire test.

How I Would Grade Myself:

Writing Rubric (whole test):

1. Purpose 0.5/10.0 out of 0.5/10.0
2. Drawings 1.0/10.0 out of 1.0/10.0
3. Sources 1.0/10.0 out of 1.0/10.0
4. Design considerations 1.0/10.0 out of 1.0/10.0
5. Data and variables 0.5/10.0 out of 0.5/10.0
6. Procedure 2.0/10.0 out of 2.0/10.0
7. Calculations 2.0/10.0 out of 2.0/10.0
8. Summary 0.5/10.0 out of 0.5/10.0
9. Materials 0.5/10.0 out of 0.5/10.0
10. Analysis 1.0/10.0 out of 1.0/10.0

TOTAL **10.0/10.0 out of 10.0/10.0**

Problem 1:

1. P-v and T-s diagrams 1/9 out of 1/9
2. State calculations (7 of them – including 5a) 4/9 out of 4/9

   For 6 -> Balance HX using 5a
3. Efficiency and mass flow rate calculation 2/9 out of 2/9

   w_out4-5, w_in1-2 (use isent eff or 5a), qin3-4
4. New HX effectiveness 1/9 out of 1/9
5. Final results 0.7/9 out of 1/9

TOTAL **8.7/9 out of 9/9**

Problem 2:

1. P-v and T-s diagrams 0.5/9 out of 1/9
2. State calculations (8 of them – including 3a and 5a) 2/9 out of 4/9

   Use 500 kJ/kg -> Compressor & Turbine

   Cp and Cv are variable
3. Pressure (P5) 0.8/9 out of 1/9
4. Velocity (V6) Use h5a 0.8/9 out of 1/9
5. Thrust 0.8/9 out of 1/9
6. Final results 0.5/9 out of 1/9

TOTAL **5.4/9 out of 9/9**

Final Grade:

10+(80/2)*(8.7/9+5.4/9)=72.6 out of 90 = 81%