

1. The objective that the test helps demonstrate is “Apply thermodynamics laws to gas turbines Engines using ideal cycles, reheating regeneration, and inter-cooling cycles.” This applies to the first question of the exam using the heat exchanger. Using this objective demonstrates what was used on the test.
2. Some mistakes were made during the exam. The first one that caught my attention was the diagram. In the first question, there are six states, and I only showed five states. For problem one, another problem I had was obtaining the net work when calculating the net work I left out the isentropic efficiency of the turbine. Therefore, I got the section b incorrect because of the miscalculation of net work since the net power output is divided by net work. However, I guess I thought to convert kilowatts divided by kilojoules over kilograms was 1000 times. Now looking at it, I realize that is way off and a simple mistake. For the final section of the test, I thought under the cold air assumption for thermal efficiency, I would use that equation to determine the efficiency. However, I guess that wasn't the case.

For question 2, there was trouble finding the final velocity. However, I calculated the actual temperature at five and because I used the temperatures rather than finding the enthalpies and then plugging them in, I got a different answer of about 60 m/s. What intrigues me, I completed both temperatures at five, and the temperature at five was super close to the answer. Therefore, it was the same result for the thrust with a diameter of 1.6 meters. So, I was close but did not get it correct.

The advice that I would give myself is to stop and think. I tend to overthink things. A good representation of this is the mass flow rate issue I had in question one. I should have realized that the number is absurdly large, but I just did not even think about it, I thought the units would just cancel and turn into kg/s. Nonetheless, I've realized that I understand what I am doing but think too much. **After a while I need to stop and drink a couple of beers then come back.**

3. Based on the correction and the rubric of the exam, I believe that I deserve a 67.2. After thoroughly going through the rubric and the corrections, there were a lot of things that I did and did not complete. Some of the things that I forgot to add in the exam that was on the rubric were the source, summary, and materials. I feel that my weakness is in the Analysis portion of the rubric. I think this because when I was reading my analysis in comparison to Professor Ayala, I had no real meat in what I was saying, just filler words. I felt I was good at the procedure, data, and variables. Nonetheless, I don't feel discouraged about the feeling of my grade, only a reason for me to work harder.

#### WRITING RUBRIC

0.5/10.0 out of 0.5/10.0

1. Drawings	1.0/10.0 out of 1.0/10.0
2. Sources	0/10.0 out of 1.0/10.0
3. Design considerations	1.0/10.0 out of 1.0/10.0
4. Data and variables	0.5/10.0 out of 0.5/10.0
5. Procedure	2.0/10.0 out of 2.0/10.0
6. Calculations	2.0/10.0 out of 2.0/10.0
7. Summary	0/10.0 out of 0.5/10.0
8. Materials	0/10.0 out of 0.5/10.0
9. Analysis	.5/10.0 out of 1.0/10.0
<b>TOTAL</b>	<b>7.5 /10.0 out of 10.0/10.0</b>

PROBLEM 1)

1. P-v and T-s diagrams	.75/9 out of 1/9
2. State calculations (7 of them – including 5a)	3/9 out of 4/9
3. Efficiency and mass flow rate calculation	1/9 out of 2/9
4. New HX effectiveness	.5/9 out of 1/9
5. Final results	.5/9 out of 1/9
<b>TOTAL</b>	<b>5.75/9 out of 9/9</b>

PROBLEM 2)

1. P-v and T-s diagrams	1/9 out of 1/9
2. State calculations (8 of them – including 3a and 5a)	4/9 out of 4/9
3. Pressure (P5)	.75/9 out of 1/9
4. Velocity (V6) Use h5a	.5/9 out of 1/9
5. Thrust	.5/9 out of 1/9
6. Final results	.5/9 out of 1/9
<b>TOTAL</b>	<b>7.7/9 out of 9/9</b>

$$7.5 + (80/2) * (5.75/9 + 7.7/9) = \mathbf{67.28}$$

4.

a. An issue that arose for problem two was determining the temperature at stage three. It had me stumped. Therefore, I looked at the notes of the lectures and I realized the isentropic efficiency of the turbine equaled the isentropic efficiency of the compressor.

b. How I went about the problem was I first read the problem thoroughly to correctly determine the states. Then I went through the process of solving for each state

accordingly. Finally, I tried solving the equations. What I would change about this next time is putting more energy into the written rubric portions of the exam, because I did not spend too much time on it.

c. I have learned new concepts on the P-V and T-S diagrams, regeneration, jet propulsion, and to effectively use the tables to get the information that is needed for the problem.

d. I think engineers use these types of concepts. I think using the tables is applicable for every field. An engineer working on Jet propulsion, for example, would be calculating the inlet flow, temperatures throughout every stage, and determining what materials would work best for the aircraft or how to make the system more efficient and cheaper.

e. I think where I will be using thermodynamic applications is on the jobsite. Where I need to find the temperatures throughout a system.

f. What I have learned is to be as detailed as possible, especially if you are submitting your work to your boss or submitting your discoveries to people who are not familiar with your studies.

g. I believe using this information will carry out throughout my entire career as an engineer, making sure that as I submit my work that clients might understand why I chose the way I did.

h. Yes, from what I have used to organize my writing and such, and the way I take my notes before class, so I can thoroughly understand what the professor Ayala is talking about, I implement in my other classes.

i. The area I feel I have improved the most is the P-V and T-S diagrams because in the beginning of the semester I was very nervous because I was always bad using those diagrams.

j. I have always found interest in jets and how they operate, so I feel the course content of jet propulsion motivated me that much more about that field.

k. I would say I spend about 6 hours on the test. I do believe the test was super organized in a fashion where I could completely understand the rubric. There is nothing I would change or do differently.