MET 350 Test 1 Reflection

1)

Test 1 demonstrates work toward many of the outlined course objectives. Problem 1 works with a Brayton cycle that incorporates solar energy and an ideal gas turbine system. Another notable objective is number 4, applying thermodynamic laws to Jet Propulsion Engines using ideal cycles. Problem 2 required us to find the gas pressure and velocity of gases at the exit as well as the thrust.

2)

My test was not too far off from the solution, although there were still a couple of errors. I should have been more detailed in my PV TS diagrams, I did not label qin or qout. In problem 1 I also missed state 6 altogether which threw off my ability to find the new heat exchanger efficiency. I should have looked over the information more closely to find that there was an additional state after the exchanger. For problem 2 I made a couple of minor mistakes that threw off my final answer. When I calculated the final velocity, I used an incorrect formula for the velocity and swapped enthalpy 5 and 6 for temperature 5 and 6. This mistake was from my confusion on variables, so I used this equation with temperature rather than enthalpy.

If I were to take this test again, I would double check that I was using the correct formulas so I don't have little mistakes again. Another big thing I would correct is to really hone in on the PV TS diagrams because I know that those set up the rest of the problem so I need to make sure I have all the states in there. I would also tell myself to look at more practice problems beforehand to familiarize myself with the formulas so I don't make the same mistakes.

3)

<u>WRITING RUBRIC (Applied to the whole test, not to particular problems)</u>

1. Purpose 0/10.0 out of 0.5/10.0
2. Drawings 1.0/10.0 out of 1.0/10.0
3. Sources 0/10.0 out of 1.0/10.0
4. Design considerations 0/10.0 out of 1.0/10.0
5. Data and variables .25/10.0 out of 0.5/10.0
6. Procedure 0/10.0 out of 2.0/10.0
7. Calculations 2.0/10.0 out of 2.0/10.0
8. Summary 0/10.0 out of 0.5/10.0
9. Materials 0/10.0 out of 0.5/10.0
10. Analysis 0/10.0 out of 1.0/10.0

TOTAL **3.25/10.0 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)	3.0/9 out of 4/9.
3. Efficiency and mass flow rate calculation	2/9 out of 2/9
4. New HX effectiveness	0/9 out of 1/9
5. Final results	0.5/9 out of 1/9
TOTAL	**6/9 out of 9/9**

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)	3/9 out of 4/9
1. Pressure (P5)	1/9 out of 1/9
2. Velocity (V6) Use h5a	1/9 out of 1/9
3. Thrust	1/9 out of 1/9
4. Final results	0/9 out of 1/9
TOTAL	**7/9 out of 9/9**

Final Grade: 58.04

4)

A.

I quickly went over the directions for the test and jumped into the questions and because of that I missed the writing requirement. I did not include the required elements like purpose, design considerations, analysis, etc. This resulted in a lot of points taken off for an easy part of the test. I will fix this by carefully reading the directions for each test to ensure that I don't miss simple instructions.

B.

In order to ensure the test was completed fully, I gave myself plenty of time to look over the questions and take my time going through the process. The only thing I would change is my organization on the paper just to make the flow of the work easier to see and go back to.

C.

For this test almost all of the information and concepts were new to me but I learned a lot about heat exchangers and Brayton cycles. A big concept that I learned is how to take values that

I wouldn't think have any relation and use them to find every other missing piece of information. Learning the ways to modify the existing formulas has been new to me.

D.

Engineers are always trying to improve their products and I think they would follow a similar process to how the second problem was presented. Mainly for calculating the efficiency, since they need to prove that each iteration of their design is better than the previous one.

E.

I know that I will be using these skills from class in my future career due to how universal the cycles are. This test represents the fundamentals of engineering so its very likely the same kinds of questions will come up in the field.

F.

After learning about Brayton cycles I can see the importance of them especially because they seem to be used in many industries so I know that knowing how to calculate values for a cycle will be useful.

G.

The skills needed for this test will definitely be utilized in the future as I continue on the engineering path. Once I enter the industry reagarlesss of field I am sure that these types of problems will come up and need to be calculated.

H.

I personally have not yet have the opportunity to use these concepts that I have learned in this course but as I progress professionally I know that the knowledge will be useful.

I.

I know that on future tests I will improve by make sure to write out all of the procedures, analysis, etc that are on the writing rubric. This will not only keep me organized but also give me the best chance at a better grade.

J.

Finding thermal efficiencies as seen in the first question will be an important part of designing large engines or other systems. Not to mention knowing how to evaluate a jet propulsion system is very useful in many engineering fields. Since I am looking to go into automotive, the course content will help me understand the technical aspects of engines and propulsion systems.

K.

Overall, I spent about 6 hours working on this test all in one day with some large breaks in between. I think the total time I spent on the test was adequate because I was able to complete both questions. If I could go back and take this test again, I would break up the work across multiple days to give me a chance to look at it with fresh eyes which might have helped me catch some of my errors.