Test Relfection 1
3/2/2025
Matthew Heare

This test related to a few of the course objectives, including that of developing an intuitive understanding of how to apply the first and second law of thermodynamics to different thermal system, applying thermodynamics laws to gas turbines engines using ideal cycles, reheating regeneration, and inter-cooling cycles, and applying thermodynamics laws to jet propulsion engines using ideal cycles. I mention those specifically as both questions were based on ideal process utilizing air as an ideal gas, with problem one dealing with a regeneration and problem two involving jet propulsion.

There were a few places where I could have done far better. I had a really tough time creating the PV/Ts diagram for problem one. There should have been six states, and my diagrams only include five. I second-guessed myself as I knew that I should have had six. Another issue I found when comparing my test to the test solutions was that I had different new work and q-in value. Part of the reasoning for that, for problem one, was that I had misorganized my states, which led me to gather different values. If I were to retake this test, I would start by practicing how to create pv/ts diagrams, understanding energy in/out along with work in/out, and spend a little more time familiarizing myself with the tables.

Despite the now clarified method of splitting the problems into separate parts, I feel that my writing rubric was spot on with every portion of it. I believe that the purpose 0.5/10, Drawings 1.0/10, Sources 1.0/10, Design Considerations 1.0/10, Data and Variables 0.5/10, Procedure 2.0/10, Calcuaions 2.0/10, Summary 0.5/10, Materials 0.5/10, and Analysis 1.0/10 with a final total of 10/10 for the technical writing portion of the test. For problem one, pv/ts

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0.5/10, state calculations 2.75/9, efficiency and mass flow rate calculation 1.75/9, new HX effectiveness 0.75/9, final results 1/9 with a total of 6.75/9 being the total. For problem two, I would say that pv/ts 0.5/10, state calculations 3.0/9, pressure 0.5/9, velocity 1.75/9, thrust 0.75/9, and final results 1/9, with a total of 7.5/9 being the total for problem one

I had trouble understanding the PV/Ts diagrams, so to resolve that issue, I kept going back through notes and Canvas, looking over practice problems on how it was done. I sat down in almost one entire sitting to knock the test out as it was the only time I had to work on it, and it helps me maintain my train of thought when I work continuously. Learned that solar energy can be used as a source of energy addition for these cycles, in nuclear submarines, power plants, automobiles, industry, and probably many more places. I think I will use all this information in autoengineering as we covered how to solve for all the states on both combustion and diesel engines, which will be most helpful for my professional career as I want to pursue automobiles. I improved the most on calculating q in and net-work. I see this being directly involved in performance automobile engineering. I spent roughly seven and a half hours working on the test one sitting with a few small breaks. I would try and break the time up into two intervals next time.