

1. The test required us to use pressure and forces of fluids along with the conservation of energy principles to evaluate multiple situations in the system to determine the appropriate parameters or derive the necessary information. Bernoulli's equation was used extensively during the test to reinforce our need to utilize this key principle throughout fluid mechanics. Both fluid pressures/forces and conservation of energy are listed on the syllabus as vital course objectives that will be covered in the material.
2. Each section listed below:
 - a. Correct based on solution provided
 - b. Correct based on solution provided
 - c. I confused myself on what the problem was actually asking for. I did not recognize that the manometer would tell us the height of the mercury. Therefore, I did not attempt to solve for "h". The problem did not explicitly call for the dimension and the hints that the professor gave us alluded to the fact that it would cancel out and we would not need the height. This further confused me and led me to only give a portion of the answer. Next time, I would recognize the true function of the manometer and know that the true answer was the dimension of height.
 - d. I only assumed the forces on one elbow and did not recognize that the pressure applying back toward the elbow came into play. I was able to account for the weight for the force in the y-direction; however, this was the part of the test I struggled the most with and had to get something on paper prior to the submittal deadline. I should have done better on this question since I performed well in Statics class, but I was not able to merge the two concepts together.
 - e. Correct based on solution provided
 - f. Correct (within reason) based on solution provided
 - g. The question wording was confusing relative to the dimensions of the block at the bottom. I read the dimension "5 feet long square" to mean that the area (length * width) would be 25 square-feet. The solution uses the 1-foot side to get 5 square-feet, which is confusing because the shape cannot be a square if one side is 5 feet and the other is 1 foot. I did somehow miss the value for the coefficient of drag, so my answer would have been incorrect regardless, but I did have the procedure down correctly. Next time, I will ask for clarification if anything seems confusing. Unfortunately, in this case I thought I knew what was meant.
3. Purpose – 5; Drawings & Diagrams – 10; Sources – 5; Design Considerations – 10; Data & Variables – 4; Procedure – 18; Calculations – 14; Summary – 4; Materials – 5; Analysis – 8;
Total Score – 83 based on the couple parts that I got confused on and there could have been more detail in Data & Variables, Summary, and Analysis sections. I think that my writing and communication would have enabled another engineer to see my flaws and we would have been able to work through the issues easily.
4. Each section listed below:
 - a. The biggest issue I encountered during the test was the misunderstanding of exactly what the questions was looking for on a couple parts. Secondly, the wording confused in a couple sections that caused me to re-read them multiple times trying to gain understanding.

- b. I went through the parts of the test that I knew for sure I would be able to complete. This left a couple sections that were confusing me. I would definitely reach out to the professor to get more assistance. In class, he indicated that he would not answer questions, but after hearing more from others, it appears he did provide some insight into the solutions as well.
- c. I have learned more about the forces within a pipe and how they interact and more about manometers.
- d. Engineers use these concepts in any pressurized piping system or heat exchangers for power or heating purposes.
- e. Similarly, the company I work for deals with these pressurized systems.
- f. Yes, I have already been able to more easily converse with colleagues at work and more easily understand the problems in order to work to a resolution.
- g. As I stated in the previous answer, I deal with engineers on these systems now, so this will become another tool in the toolbox as I further my career within the company.
- h. See previous answer.
- i. I was most successful in the problems that dealt with flow and power needed to support the flow rate.
- j. As I get further integrated into the engineering aspects of my job, this course will prove beneficial to providing a knowledge base that allows me to solve problems and converse in a more educated manner.
- k. I spent approximately 14 hours on the test over the course of several days (due to family commitments). The first part was spent setting the problems with the pre-test and the rest on performing the calculations. I would definitely communicate more with the professor to ensure that I was at least on the right track relative to some of the more confusing problems.

Overall, I felt the test was challenging and forced us to recognize what aspects of the material covered in class is being utilized. Many of the problems required us to use one concept to provide a piece of the answer that was then needed to be used in a second concept that may not be typically associated together. I feel that my writing ability is strong enough to help explain my thought processes so that my errors or where I got off track is easily identified and then correctable. I need to spend more time focused on the forces part of the material as that seemed to be my biggest challenge on this test. Based on the submitted content of my test, I feel it shows that I understand the concepts needed to be applied in each situation. There were a couple cases where the instructions were not clear and/or misunderstood that led to some errors and miscalculations. However, having the correct concepts makes it easier to correct simple misunderstandings and eventually arrive at the correct resolution.