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MET 330

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Test 1 Reflection

Fluid Mechanic's (MET 330) Test 1 combined the topics of fluid properties, pressure, fluid dynamics in piping systems (pipes and fittings), conservation of energy and mass using Bernoulli's equation, friction loss computations, and pump selection for a system. All these course objectives must have been understood so I could establish a solution process for the problems presented in test 1. In problem 1, understanding the properties of specific weight for different fluids was key for me to reach a solution. Different fluids act differently when they are placed in the same system as another fluid. Also, knowing how pressure changes in stagnate fluids was vital for me to reach a solution to the problem. In problem 2, there was multiple things that I needed to analyze so that I could reach the result. Knowing the continuity equation and being able manipulate it to solve for a desired variable allowed me to take my first steps in solving the problem. Next, I had to use the knowledge I had on analyzing systems to isolate the problem I needed to solve for. Along with using what I knew on friction loss in pipes and fittings I could gain the necessary information needed to use Bernoulli's so I could get one step closer to finding my solution. Using Bernoulli's, I was then able to find the solution to what pump is required and the pressure at the pump inlet.

My test was close or the same as the solution provided in some sections, while in others it differed. For problem 1, I had the same process as provided in the solution and my calculations were not far off other than rounding differences. For problem 2, I started off on the right track and had the same pipe dimensions selected as the solution. However, I differed in the problem set up. The solution contained a different set of points than mine and neglected an entire portion of the system. I feel as if I was unclear on the instructions since I did not know the question was only asking for a portion of the system and not a section. Even with this my pump power came out being off by a difference of 0.08 from the solution. As for the pressure at the pump inlet I did not get close to the correct solution. For starters my pressure came out as a positive number which was wrong considering the pump was creating suction. I think this happened because I added a portion of the system to my calculation that should have been neglected therefore inflating my answer.

WRITING RUBRIC

1. Purpose 0.5/10.0

2. Drawings 1.0/10.0

3. Sources 1.0/10.0

4. Design considerations 1.0/10.0

5. Data and variables 0.5/10.0

6. Procedure 2.0/10.0

7. Calculations 2.0/10.0

8. Summary 0.5/10.0

9. Materials 0.5/10.0

10. Analysis 1.0/10.0

TOTAL 10.0/10.0

PROBLEM 1)

1. Identify all unknown dimensions in drawing 1/7 out of 1/7

2. Cancel the distance with water (x) 1/7 out of 1/7

3. Solve for the gasoline distance (y) 0.5/7 out of 1/7

4. Correct excel spreadsheet 1/7 out of 1/7

5. Using excel, get mercury case 1/7 out of 1/7

6. Why results make sense and manometer length 1/7 out of 1/7

7. Final results 1/7 out of 1/7

TOTAL 6.5/7 out of 7/7

PROBLEM 2)

1. Select pipe diameter using 3 m/s 1/8 out of 1/9

2. Compute all energy losses 1/8 out of 1/9

3. h_A and pump power 1/8 out of 1/9

4. Pressure at pump inlet 0.25/8 out of 1/9

5. Correct excel spreadsheet 0.5/8 out of 1/9

6. Pump power for 4 other pipe sizes 1/8 out of 1/9

7. Installation, operating, and total costs 1/8 out of 1/9

8. What is the best pipe diameter? 1/8 out of 1/9

9. Final results 0.5/8 out of 1/9

TOTAL 7.25/9 out of 9/9

FINAL GRADE: 10.0 + (80/2) * (6.5/7+7.25/9) = 79.4

My main issues were first trying to figure out where the best places to put my points were so that I could solve the problem correctly. Secondly, what portion of the I was to be working with. To overcome the first issue, I placed a lot of thought into what I was taught. First was placing the points at either a place you know everything or a place I wanted to solve for. Secondly, I remember learning in class that the points can be placed at the same position when dealing with a system, so that is what I did. For my second issue I ended up taking in the entire system into consideration because I assumed the friction needed to be taken calculated for the whole thing which I know realize was wrong.

First, I started as early as I could which was four days before the due date. Next, I took at least two to four hours to analyze the whole test. After I thoroughly analyzed the test, I brainstormed how I was going to go about each problem. After that I got to work and trusted the process and techniques that I learned in class until I got a final answer. If my process and answers seemed right, I would move on to the next part until I was finished. After I finished, I re-wrote my work in the proper format that was required for the test this way it was clean and legible.

I learned the concepts of properties of fluids, pressure, Bernoulli's equation, friction losses in pipes and fittings, pumps, pump selection, and analyzing and solving systems.

I think engineers use these concepts with many design processes. For example, the dormitories on ODU's campus. They all contain running water for sinks, showers etc. Without the concepts related to the course objectives covered in this test, I think designing the systems of their magnitudes would be impossible.

Depending on where I end up after college in my career, I could be using the information learned in numerous different jobs. If I become involved with automobiles, I would have to use the properties of fluids because of the oils and gas needed for the car to run.

I do think the concepts learned form this test will be useful in my professional career.

I hope to work in the automotive industry after graduating and fluids are necessary for cars to operate. These fluids will operate with same concepts that were learned from this test therefore I might have to use them later in my career.

I have used the properties of flids such as dynamic viscosity and density for other classes. Along with equations on computing these properties in at least one other class so far,

I feel like I was most successful in the computation of the height change in the first problem. Also, in the second problem, even though I misunderstood the question slightly, I think I did well in analyzing the process that needed to be taken to solve for what I thought was being asked. Despite getting the wrong answer I took the right steps in getting my values.

Like stated before, if I am lucky enough to succeed in where I want to go after graduating, I see this content having potential in being apart of my work in my field.

I spent a total of roughly 20 hours or more on this test. From organizing my thoughts and the process that I needed to take, to completing the calculation, and rewriting and formatting. I would not change anything about how I went about the test because I feel like I started early and allotted enough time to get it done without having to stress over the deadline.