Colby Watts
MET 330 Test 1 Reflection
Orlando Ayala
2/14/24

1.) How and why the test demonstrates your work toward one, or more, of the course learning objectives.

- The work that I have done during this test directly correlates to the viscosity of fluids which depends on temperature, pressure, and the type of fluid. Pressure measurements such as finding the pressure in the manometer between the two systems. Bernoulli's equation calculating for pressure on one side of system as well as calculating for pipe losses such as the elbows and entrances and valve in the piping that move the liquid in a certain direction.

2.) How your test compares against the available solution.

- The way my test compares against the available solution is my purpose, drawings, sources, data given or acquired is all correct, the one thing I did not get correctly was the elbow losses instead of using 30fT I used the 20fT as I thought that was for a standard elbow. I did get the correct values needed to perform Bernoulli's equation, but my equation was wrong. I crossed out (V2^2/2g) which is correct, and I also crossed out (Z2) as I had already figured out that that (Z1=38ft and Z2=18ft) then subtract the to get 20ft. What I did not do is add P2 which is my PB to the specific weight of ethyl alcohol, what I did was divide the specific weight of ethyl by the 40 psig. Other than that, my Bernoulli's equation was correct. The other thing that I got wrong was solving for V2 I had gotten it right in my Pre-test submission. For the actual test submission, what I had put down for the hand calculations instead was (.557/0.0233) = (2.39 ft/s) which is the wrong answer but correct values. What I did was I did it correctly on the hand calculations and looked at excel for the answer which ultimately gave me the wrong answer since I plugged in .557 wrong. To sum that up when I put it in my excel sheet, I added a zero which made (.557) to (.0557) then I put that answer from excel on my hand calculation sheet. A very dumb mistake on my part that could have been easily avoided if I had looked carefully. Ultimately though I found a loophole in the equation to find V becuase instead of multiplying by pi at the bottom and top I found the area of the pipe instead. Not having the correct value for V messed up everything else. For my Reynolds number I used the correct values, but my V was wrong which messed up my moody chart calculation. My friction factor was correct with 0.019 but I used the wrong equation to find elbow losses and I used 20fT as I stated in the beginning of this. My energy loss equation is incorrect because I used (hL1B = (f)(L/D)(V^2/(2)(g))+2(K)(V^2/(2)(g)). What I should have done is broken it up and solved for each part of the losses. As well as solve for the valve loss as well. I also thought I needed to convert every value of ft/s to in/s.

- For the manometer I used the completely wrong equation and was way off. I used ΔP = γ * h and then manipulated that into γ(Hg) * h – γ (EA) * h. Which is

completely wrong. I never added another reference point for the manometer entrance into the tank on the left either.

- I also never solved the second part wrong and never calculated for the second manometer reading when fluid I not moving. Another thing is I did not understand when asking for multiple values of flow rate but seeing the solution I understand it a lot better because I was no sure what values to use but I am guessing I could have used any values and it would have been fine.

- Something that I should do is be confident in my answers and not erase so much and double check everything. My biggest problem is thinking something will be wrong or I try and look at the realistic side of my answer.

3.) What your grade should be. Base it on the writing rubric provided in the test and the correctness of your solution. What are the strengths and weaknesses of your test?

WRITING RUBRIC (APPLIES TO THE WHOLE TEST, NOT TO PARTICULAR PARTS)

1.	Purpose	0.5/10.0 out of 0.5/10.0
2.	Drawings	1.0/10.0 out of 1.0/10.0
3.	Sources	1.0/10.0 out of 1.0/10.0
4.	Design considerations	1.0/10.0 out of 1.0/10.0
5.	Data and variables	0.5/10.0 out of 0.5/10.0
6.	Procedure	2.0/10.0 out of 2.0/10.0
7.	Calculations	2.0/10.0 out of 2.0/10.0
8.	Summary	0.5/10.0 out of 0.5/10.0
9.	Materials	0/10.0 out of 0.5/10.0
10.	Analysis	0.3/10.0 out of 1.0/10.0
	TOTAL	**8.8/10.0** out of 10.0/10.0

1st part)

1.	Bernoulli's at liquid surfaces and solve for air pressure	1/7 out of 1/7
2.	Compute velocity with Q=VA	1/7 out of 1/7
3.	Compute energy losses (pipe and minor)	1/7 out of 1/7
4.	"gamma*h" equation and solve for "h" in manometer	.3/7 out of 1/7
5.	Compute pressure at 2nd elbow	0/7 out of 1/7
6.	Create spreadsheet with all calculations	1/7 out of 1/7
7.	Correct results?	0/7 out of 1/7

2nd part)

1.	"gamma*h" equation and solve for air pressure	1/3 out of 1/3
2.	"gamma*h" equation and solve for "h" in manometer	0/3 out of 1/3
3.	Correct results?	0/3 out of 1/3

3rd part)

1.	Use spreadsheet from "1st part" to get P1 for diff Q Make sure energy losses change when changing Q	1/4 out of 1/4
2.	Plot P1 vs Q	1/4 out of 1/4

3. Read Q for P1=75 psig 0/4 out of 1/4
4. Correct results? 0/4 out of 1/4

FINAL GRADE:

If getting everything right:

8.8 + (80/3)*(4.3/7 + 1/3 + 2/4) = 47.4

- I did poorly on this test but in some sections I strived in using correct equations or even solving for the correct part of the problem, even though my answers were incorrect my strongest part of this test was part 1.

4.) Discuss the following.

a. An issue I encountered was trying to figure out how to manipulate Bernoulli's equation to solve for the missing pressure. To troubleshoot this problem, I went with what I thought was correct. Another issue that I encountered was solving for the manometer, I used a bunch of examples and stull did not understand how to solve for that part.
b. The thing I would change is to relax and not overstress and to not lose sleep at night. The steps I took was to clear my schedule from other classes and do that work first so my focus was the test during the week and take breaks when I need.
c. A new concept that I have learned is solving for h in the manometer.
d. Engineers use this when designing pressure system tanks for houses or buildings or water-cooled chillers. Even plumbing uses these concepts.
e. Hopefully I will be using everything at my job in the near future.
f. I think everything I learn is important for my professional career because I can say that I have learned that, or I know something about that and not have to say I don't know.
g. Fluid mechanics is used for designing heating and air-conditioning systems, turbines, engines, pumps, air compressors and flow of fluids.
h. I have not been able to apply concepts of what I learned in this course because I have not had a job that would involve fluid mechanics. I worked at a breakfast restaurant, I guess you could say the viscosity of the batter or the flow of gas lines to the grill I am cooking on.
i. The area I felt most successful is when I found everything on the tables correctly and I would say I improved the most on formulating an answer.
j. Honestly, I see it intervening with a lot of what I might be doing in the future. Such as for my internship where they recently installed 350-ton chillers or put huge boilers in schools.
k. The amount of time I spent on this test without adding breaks and going on my phone was probably around cumulatively 24 hours. That I am serious about. What I would do differently is spent less time and just go with whatever my first answer would because I can always go back and change numbers in the excel sheet. I would also start my excel sheet sooner and use that to change numbers instead of erasing hundreds of times.