Test 1: Reflective Essay

Test 1 was a clear demonstration of my work towards key learning objectives in our Fluid Mechanics course. It tested my understanding of the fundamental nature of fluids, particularly focusing on defining and measuring fluid properties such as velocity and pressure. This part of the test was crucial in showing my ability to not only grasp theoretical concepts but also apply them practically. The test also covered fluid dynamics within pipes and fittings, challenging me to apply the principles of conservation of energy and mass, embodied in Bernoulli's equation, to real-world fluid flow systems. Lastly, computing friction losses allowed me to illustrate my competency in assessing energy dissipation in multiple parts of the fluid system (entrance, elbows, gate valve, pipe).

In comparing my performance on Test 1 against the solutions, I accurately computed both major and minor losses, successfully applying Bernoulli's equation to find the pressure in the right tank; however, I encountered difficulties with the manometer reading, particularly in calculating the height (h). Despite correctly selecting the two points and formulating the equation using gamma*h to solve for pressure, I incorrectly assumed h to be 18 ft in a hurried decision prompted by time constraints. This mistake stemmed from my hesitation and overthinking about how to derive h, not realizing that the solution lay in the very equation I had formulated, where h should have been isolated instead of pressure. I then could have solved for h by plugging in values. If I were to retake this test, my advice to myself would be to trust the processes I've learned and not to second-guess my instincts. Specifically, I should focus on applying the equations systematically, rather than rushing to conclusions under time pressure.

Writing Rubric

Purpose	0.5
Drawings	1.0
Sources	1.0
Design Considerations	1.0
Data & Variables	1.0
Procedure	1.5
Calculations	1.0
Summary	0.5
Materials	0.5
Analysis	1.0
TOTAL	**9/10 = 90%**

Part 1

Bournoulli's at liquid surfaces and solve for air pressure	1
Compute velocity with Q=VA	1
Compute energy losses (pipe and minor)	1
"gamma*h" equation and solve for "h" in manometer	0.5
Compute pressure at 2nd elbow	0.5
Create spreadsheet with all calculations	1
Correct Results?	0.75
TOTAL	**5.75/7 = 82%**

Part 2

"gamma*h" equation and solve for air pressure	0.5
"gamma*h" equation and solve for "h" in manometer	0.5
Correct Results?	0.5
TOTAL	**1.5/3 = 0.50%**

Part 3

Use spreadsheet from "1st part" to get P1 for diff Q	1
Plot P1 vs Q	1
Read Q for P1=75 psig	1
Correct Results?	0.75
TOTAL	**4/4 = 94 %**

FINAL GRADE: 78%

Discussion

My approach to tackling the test involved using Notability on my iPad for written work and calculations, then organizing everything in the Notes app before compiling it into a single PDF. This method worked well for me, and I wouldn't change it.

Throughout the test, I reintroduced myself with using Excel for data tabulation and graphing flow rate versus pressure. This skill is not only fundamental in academic settings but is also extensively used by engineers in the field. Specifically, in Fluid Mechanics, such capabilities are crucial for analyzing systems involving tanks, pipes, and valves, similar to the scenarios I encountered in the test.

I foresee the concepts learned and applied in this course being highly relevant if my future job involves Fluid Mechanics. This could include careers in HVAC, work with engines, turbines, pumps, and other machinery involving fluid flow.

I dedicated 10-15 hours to the test, spreading the workload over several days with around 2 hours of focused work daily. Reflecting on this experience, I recognize the importance of being more efficient, particularly in formatting and preparing my skills with Excel. Improving these areas would not only streamline my workflow but also enhance my ability to analyze and present data effectively.

In conclusion, the insights gained from this test, along with the hands-on use of Excel, emphasizes the importance of what it means to be an engineer. Moving forward, I want to refine my time management and technical skills, to be sure that I can apply my knowledge effectively in real-world engineering situations.