Naftaly Gichunga **MET 330** **Test 3 Reflections**

Briefly discuss;

1) **How and why the test demonstrates your work towards one, or more, of the course learning objectives. Be specific on the course objectives you decide to mention.**

Test 3 covered a number of course objectives. Both problems in this test checked the student's ability to identify and compute energy losses in pipes and fittings for a variety of configurations. The problems prompted the students to apply the bernoullis equations for two branches. For each branch the student was required to identify the parts of the pipes and fittings that could contribute to energy losses as the fluid flowed through the configuration. To determine the flow rates through the branches, the students were expeted to solve the equations by iteration using an excel spreadsheet.

The test covered the following objectives:

- Explain the fluid dynamics in pipes and fittings;
- Apply the principles of conservation of energy (Bernoulli's equation) and mass to fluid flow systems;
- Compute friction losses in pipes for a variety of configurations (series, parallel, network, etc.);

2) **How your test compares against the available solutions. State the mistakes you made and what you will do next time to avoid making same mistakes.**

Compared to the available test solutions, my test solutions are very close to the solutions. There might have been a slight variation in the way that I did my iterations but the final answer was close to the correct answers.

The only mistake that I can point out in my working was the evaluation of the friction factors of the ball valve and gradual reduction. If I was to take this test again, I would make a point of using the correct friction factors for more better results.

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

In reference to the posted solution; I came up with the following grades for my test:

PROBLEM 1

1.	Reasonable assumptions (reductions, valve, tubing diam, lengths)	1/10
2.	Apply Bernoulli twice or get 2 equations from Bernoulli	1/10
3.	Consider ALL minor losses? Handled them correctly?	1.5/10
4.	Handled correctly the pipe losses?	1/10
5.	Obtained 3 equations with 3 unknowns?	1/10
6.	Solved system of equations correctly (Excel?)?	2.5/10
7.	Final results	0.8/10
	TOTAL	**8.8/10**

FINAL GRADE:

(90)*(8.8/10) = 79.2

PROBLEM 2

1.	Reasonable assumptions (reductions, valve, tubing diam, lengths)	1/10
2.	Apply Bernoulli twice or get 2 equations from Bernoulli	1/10
3.	Consider ALL minor losses? Handled them correctly?	2/10
4.	Handled correctly the pipe losses?	1/10
5.	Obtained 3 equations with 3 unknowns?	1/10
6.	Solved system of equations correctly (Excel?)?	2.5/10
7.	Final results	1/10
	TOTAL	**9.5/10**

FINAL GRADE:

(90)*(9.5/10) = 85.5

4) **Discuss the following:**

   a) **What issues did you encounter in completing the test? How did you troubleshoot them?**

The primary issue encountered while completing the test was interpreting the information given in the problem. It took me a while to identify all losses in the pipes and fittings. To troubleshoot them I had to systematically identify the possible losses form left to right.

b) What steps did you take to complete the whole test? Would you change something?

I started working on the test by identifying what information was given. I then applied the Bernoullis equation which generated two equations. I then solved the unknowns using the spreadsheet.
I will still use the same approach in future tests as it is systematic and thorough.

c) What new concept have you learned?

Over the past few weeks, I have learned how to apply the Bernoullis equation for various configurations as well as using iteration to solve for the unknowns. In the process, I have mastered spreadsheet skills that simplify calculations when a number of similar equations need to be evaluated.

d) Where you think engineers use those concepts (provide specific examples)?

Engineers use the concept while designing fluid flow systems with desired flow rates. Specifically, engineers whould use the concept of determing the losses through fittings when a desired flow is required at two different points with different losses. To do this, engineers would add valves or use different pipe diameters to attain a desired flow rate.

e) Where do you think you will use everything you learned?

I will use everything learned in the class in the future if I happen to work in a consulting company assigned to design fluid flow systems. The knowledge will also be applicable if I'm in charge of maintaining such systems. With my passion for teaching, I will also use the knowledge learned to teach students in the future whenever I get the chance to pass down the knowledge to the future engineers.

f) Do you think what you learned is important for your professional career?

The concepts learned in this class are essential to my career as an engineer, as I will have to work with fluids.

g) How, when, where and why you might use this information or skill in the future?

The knowledge from this class will have various applications in my career. Starting with the semester-long project in this class, to the Fluid Mechanics lab, I look forward to more applications of the knowledge in my career as I plan to specialize in Marine Engineering.

h) Have you been able to apply the concepts you have learned in the course to what you at work or in other courses?

The concepts I have learned in this course have helped me in Fluids Mechanics lab discussions and conclusions.

i) What areas did you feel were most successful, or improved the most?

I have gained so much knowledge on the application of Bernoulli's equation in pipes with different configurations.

j) How do you see this course's content intersecting with your field or career?

The course content will greatly apply to my career as a marine engineer; everything is designed around pressure and forces of water. Understanding the course contents will give me a head start as I join the workforce.

k) How much time did you spend on the test? How was the time organized? What would you do differently? Why?

I spent around ten hours working on various parts of the test. I spent two hours figuring out what the problem was all about and the rest of the time working on the actual problem. In the future, I will try doing more research and analysis by participating in the pretest, determining the all concepts covered by the test problems.