Reflection for Fluid Mechanics Test 3

1)

The test demonstrated my work towards multiple concepts that were learned throughout the fluids course. I am able to work well with excel and the iterations to get to the solution I need to get. I now understand how flow rate is affected by the number of branches in a system which will help me in my future career to design piping systems and understand how the iterative process works to find the solutions to problems with multiple unknowns.

2)

This test demonstrates my ability to calculate multiple flow rates in different branches and find the total flow rate of the system. The main objective that this test proved that I understood was Computing the friction losses in pipes for a variety of systems especially the parallel pipe system. The other objective I was able to achieve through this test was applying the principles of conservation of energy (Bernoulli's equation) and the mass to fluid flow. One of the main things that I left out of Bernoulli's Equation is Velocity a point B. I believe this is a huge factor as to why my values were off from the solutions. I think one thing that I could have done differently is to incorporate the velocity value in my Bernoulli's Equation so that I could have two different flow rate values. This would have allowed me to iterate properly so that I could solve for the Q total. One Piece of advice that I would give myself is to write out the equations that I would need before trying to solve the problem. Doing this first would have most likely helped me solve the problem correctly without any errors. Take my time thinking about the problem and looking through the lectures to understand how these problems are solved then set up the equations. After that I would be able to iterate through excel and get the right solutions.

3)

1st Problem

1. Label Branches and put reference	⅛ out of ⅛
2. Apply Bernoulli's Correctly and get two Equations	⅛ out of 2/8
3. Define Energy losses for both branches	2/8 out of 2/8
4. Get Flow rate (iteration process)	2/8 out of 2/8
5. Correct results?	0/8 out of 1/8
	Total: 6/8

2nd Problem

1. Label new branches	⅙ out of 1/6
2. Get new third equation	⅙ out of 1/6
3. Modify conservation of mass Equation	1/6 out of 1/6
4. Manipulate equations appropriately	⅙ out of 1/6
5. Get flow rate (iteration process)	⅙ out of ⅙
6. Correct results?	0/6 out of 1/6
	Total: 5/6

Final Grade

(90/2)*(6/8+5/6)=71.25

4)

a) One of the issues that I encountered during this exam was manipulating Bernoulli's so that I had all the correct variables needed to solve for the unknown flow rate values.
b) The process that I was using for this test was great, I was on the right track to getting the right answer. I was able to manipulate the equations 90% correctly and use the equations to input the existing values to receive an answer. The thing that I would change is take more time to think about the problem at hand opposed to grabbing equations and trying to make them work.
c) The Concepts that were used were manipulation of Bernoulli's equation to compute losses throughout a system as well as the concept of parallel pipe systems. Using these concepts I was able to understand that as there are more branches involved in a system, there will be a Bernoulli's equation for each branch. Also as the number of branches increase, the flow rate will also increase due to all the newly introduced losses.
d) I believe engineers use these concepts everywhere from water treatment plants to the water cooled systems in a building. The concept of parallel pipes is all around us and widely used in multiple applications like gas stations. All the different pipes run to each pump so that it can supply gas. All the pipes that branch off from a water tank to be supplied to people's homes.
e) I believe that I will be using everything that I learned during this test at my future jobs/ careers that I will hold. Especially working in the wastewater field, designing piping systems will be a huge part of that field so the test material learned on this test will be heavily used in the field.
f) I believe that what I learned in this test is very important to my future professional career, this will help me to be accurate in my calculations meaning that safety will be accounted for as well as making my work more efficient.
g) I believe I will use this information when designing multiple branch systems such as sprinkler systems for building and or dealing with HVAC systems for facilities.
h) For this course I have been able to use some concepts/ knowledge gained to apply them to other classes/ work that I am doing.
i) The Areas that I feel most successful in were Bernoulli's manipulation process, once I knew what variables I was dealing with I was able to figure out the missing components. I think one of the areas I have improved in is the iteration process.
j) I think this course will intersect with my field of interest when designing boilers for buildings. Knowing the concepts of fluids and how they work in different situations will be crucial to my success in the field.
k) I spent 4 days on this test. I spent a lot of time trying to figure out which equations I needed to use for this particular problem and making sure that the problems that I got were manipulated properly. One thing that I would do differently is to ot jump for the

equations that I know I would end up using, but actually derive the equations on my own so that I could gain a better understanding of how the equations work.