

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 2 covered several course objectives. The problem checked on the student's ability to identify, analyze and solve broad engineering problems involving stagnant and flowing fluids.

The problem covered tested a variety of concepts on the forces associated with stagnant and dynamic fluids, fluid dynamics in pipes and fittings, friction losses in pipes and open channels, configurations of an open channel, instrumentation (using a flow nozzle), water hammer and cavitation as well as drag and lift. Specifically, the problem covered the following objectives:

- Compute pressure and the forces (magnitude, location, and direction) associated with it in a stagnant fluid.
- Discuss what buoyancy is and determine object stability while floating or submerged in a fluid;
- Explain the fluid dynamics in pipes and fittings;
- Apply the principles of conservation of energy (Bernoulli's equation) and mass to fluid flow systems;
- Identify and solve for different very specific industrial problems, such as, open-channel flow, cavitation, water hammer, drag, lift, forces in pipes, and learn about different instruments to measure fluid flow quantities (such as, pressure, fluid velocity, flow velocity, 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.

My solutions to the problems were definitely off due to several errors as I answered the questions. My assumptions while determining the forces in the pipe, hickory wood log size, pressure increment if the valve closed suddenly, drag forces acting on a stuck log and forces acting upon the blind flange were wrong and left out critical considerations.

If I were to retake this test, I would make necessary considerations and assumptions while figuring out the problems.

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:

WRITING RUBRIC

1. Purpose	0.5/10.0
2. Drawings	0.8/10.0
3. Sources	1.0/10.0
4. Design considerations	0.8/10.0
5. Data and variables	0.4/10.0
6. Procedure	0.5/10.0
7. Calculations	0.5/10.0
8. Summary	0.2/10.0
9. Materials	0.4/10.0
10. Analysis	0.0/10.0
TOTAL	4.6/10.0

PROBLEM 1)

1. Open channel depth (y)
 1. Correct equation 1/2
 2. Area and Hydraulic radius 1/2
2. Pipe-elbow forces

1. Free body diagram and correct forces	0.5/3
2. Force in x	0/3
3. Force in y (weight)	0.5/3
3. Largest wood log	
1. Size	0/2
2. Stable?	1/2
4. Flow-nozzle flowmeter pressure drop	
1. Right equation and A_1/A_2	1/2
2. C value	1/2
5. Water hammer pressure increase	
1. Wave velocity (units?)	0/2
2. Pressure increase	0/2
6. Drag force on a stuck log	
1. Correct area	0/3
2. Correct velocity	1/3
3. How C_d was obtained?	0/3
7. Force on the flange	
1. Magnitude	0/2
2. Location	0/2
8. Final actual values of the results	0.3/1

FINAL GRADE:

$$4.6 + (80/10) * (2/2 + 1/3 + 1/2 + 2/2 + 0/2 + 1/3 + 0/2 + 0.3/1) = 32.3$$

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. I disregarded fundamental principles while carrying out my calculations which made most of my work wrong.

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

I started working on the test by writing the purpose as I identified what was needed. After the drawings, sources, and design considerations, I checked what information was available to determine the data and variables required for the problem. I then came up with a procedure that was used in the calculations. From the calculations, I made a summary and an analysis of the problem.

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 new concepts about fluid flowing in an open channel, forces due to static fluid, buoyancy and stability, drag and lift, forces due to fluid in motion, instrumentation, and water hammer and cavitation. These concepts have broadened my understanding of fluid flow and its application in solving both textbook and industrial problems.

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

Engineers use the concept while designing fluid flow systems. The concepts are applicable while while designing either piped systems, open channel systems or combined piped and open channel systems. Drag and lift concept is primarily applied in marine engineering as every object designed will have to move in water. In which case the forces acting on the object have to put into consideration.

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 open channels, determinations of forces in pipes, hammer and cavitation, and drag and lift.

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 on an object floating or submerged in 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.