Elson Edmonds II MET 330 Dr. Ayala 10/30/24

## Test 1 Reflection

 Question one focused on the techniques that we acquired in chapter 4 and 5. The problem required us to figure out how large the buoy needed to be in order to open the gate at the bottom of a container. Some of the strategies I used to solve this problem were the sum of forces in the x and y direction, moment about the hinge, and force of buoyancy required to move an object.

Question two was based on pressure gages and U tube manometers. The question required me to use strategies that we learned about in class to reconfigure the "gamma h" equation in order to find the deflection of mercury.

2. In question 1, my final answer of the radius was only a .1 ft off of the actual diameter required to open the latch at the bottom of the tank. I think this slight error was due to my mistakes in rounding when plugging answers in from other equations. Our set up was about the same with a few small errors in rounding. However, on the excel our charts do not look alike. I think this error was due to me inputting the equations into excel improperly. My results showed that the best angle for a smaller buoy was a zero degree angle however the correct answer was 30 degrees. My answer of a zero degree angle made sense to me due to the fact that the buoy would only have to pull in the y- direction and not waste energy on any other axis.

For question 2, we set up the problem the same using an altered version of gamma h and placid variables for unknown values of height, however when I did it, I had too many variables. I think I went wrong because I started entering too many variables for unnecessary, unknown heights of the two liquids.

If I had to take this test again, I think that I would have reached out to you for some advice when I was not too sure on interpretation. I Normally do well with spacing and making time for tests, I just need to speak up when I don't know what is going on.

3.

0.5/10.0 out of 0.5/10.0
1.0/10.0 out of 1.0/10.0
1.0/10.0 out of 1.0/10.0
1.0/10.0 out of 1.0/10.0
0.5/10.0 out of 0.5/10.0
2.0/10.0 out of 2.0/10.0
2.0/10.0 out of 2.0/10.0
0.5/10.0 out of 0.5/10.0
0.5/10.0 out of 0.5/10.0
1.0/10.0 out of 1.0/10.0
10.0/10.0 out of 10.0/10.0

## <u>PART 1)</u>

1.	Magnitude of the hydrostatic force on the gate	1/8 out of 1/8
2.	Location of the hydrostatic force on the gate	0/8 out of 1/8
3.	Solve for buoy force from moment conservation	1/8 out of 1/8
4.	Using buoyancy eq to get sphere diameter	1/8 out of 1/8
5.	Are the stability arguments correct?	0/8 out of 1/8
6.	Proper excel spreadsheet	.5/8 out of 1/8
7.	Buoy size vs. gate angle plot & smallest buoy	1/8 out of 1/8
8.	Correct results?	.5/8 out of 1/8
9.	TOTAL	5/8 out of 8/8
<u>PART 2)</u>		
1.	Use geometrical relation	1/7 out of 1/7
2.	Use gamma*h procedure	1/7 out of 1/7
3.	Proper manipulation of eqs and solve for "h"	.5/7 out of 1/7
4.	Pressure difference when no flow	1/7 out of 1/7
5.	Proper excel spreadsheet	.5/7 out of 1/7
6.	Mercury deflection vs. Pressure difference plot	1/7 out of 1/7
7.	Correct results?	0/7 out of 1/7

5/7 out of 7/7

Correct results?
TOTAL

FINAL GRADE:

 $\frac{10.0 + (80/2)^*(5/8 + 5/7)}{10.0 + (80/2)^*(5/8 + 5/7)} = 63.57$ 

- 4.
- a. I Struggled with the interpretation of the problem, and to solve this I just sat and looked at the problem along with my notes and the textbook to get a better understanding of what you really wanted us to solve. I understand that the "sitting and staring" approach doesn't work for most, but for me it gets my brain moving and the wheels turning until I can put some pieces together.
- b. I planned ahead of time, and gave myself plenty of time in order to complete it, because I know that although it was only two questions I knew that it was more than meets the eye.
- c. I learned how to find deflection when given less than ideal information about a system.
- d. I think these concepts are useful when working in a field that involves waste disposal or even when designing sink installations in a building.
- e. In my future as an engineer.
- f. Yes these are real world problems that may occur in my field
- g. I will use it at my future job, when asked to do a task that invokes these skills and knowledge that I've learned, and to the best of my ability.
- h. No not in the current courses that I am enrolled in.
- i. I was the most successful in the first question, I think that's where I spent most of my time.
- j. I see this course giving me valuable knowledge that my future employers will value that I know already.
- k. I spent 3 days on the test, about 12 hours. 5 per question and 3 on the write ups. I don't think I'd do anything differently other than get some more of my answers correct.