Test 1 Reflection

By

Joel Adriano

MET 440 – Heat Transfer

Dr. Ayala

The test demonstrates most of the course objectives in the syllabus, these objectives seem to serve as a foundation to prepare for learning heat transfer concepts. The objectives that are covered in this test are defining different modes of heat transfer, applying the concept of thermal circuit to solve one-dimensional heat conduction problems, solving simple convection heat transfer problems, and use commercial computer programs to numerically solve heat transfer systems. The first question with four parts applies all of the objectives and the second question also applies all of the objectives.

My attempt on my test and the solutions mirrors each other in terms of following the same design template. I had all the sections in the right order; however, I had half resembled the answers for this test. The equations that I used were correct, but I used the incorrect variables for them. Also, I did not get within Ayala's Rule (<5%). The first mistake was not gathering enough information for Q for part a, but I redeemed myself getting the second answer right which was the temperature of the air. Part c of the first question was all wrong but the final equation was correct following the pattern of my whole test as I got the right equation for part d. My attempt on the second question to this test was completely wrong from start to end. However, the final equation and setup were both correct.

My attempt of the test based on the rubric would be that the template meets all requirements. I felt that my strengths were utilizing the right final equations, but getting the right variables is an area that I was lacking in. I felt that the test's template gave me an easier time keeping track of numbers as there were a lot to take account of this test, contrary to fluid mechanics problems. My weaknesses during this test would be the wrong approaches for each part. My final equations were right, but the processes before that were incorrect as my answers did not match up with the test solutions.

I had issues that was resolved by hints given by my instructor due to reaching out to him to clear the air as I was overthinking the test's deliverables. I would definitely take advantage of the open notes opportunity more by getting all the equations I have learned altogether on a note sheet. I need to implement more and more previous knowledge in this class as I think that it would make it easier for me to solve questions more efficiently. Old concepts like the thermal circuit were learned in a previous electrical technology class, and adding all heat flow rates was common sense as we did this in fluid mechanics. These concepts are used by engineers in a lot of inventions made. For example, HVAC systems are appropriately applied to different types of buildings because there is no need to have big HVAC system for a small space. We also need to learn heat transfer concepts because we need to design things a certain way to achieve what we need or want. I can apply this knowledge while looking at houses, refrigerators, and HVAC systems. The practice and conditioning given by this class helps me think that I am succeeding and therefore helps me in the professional field. This course's content will definitely help me in my professional career and will be needed to apply to future classes because heat transfer is all around us. I though this test was difficult, but it was due to my overthinking for the first question which caused a bad start, however it made me more interested in applying knowledge to most thing that I interact with daily.

WRITING RUBRIC (APPLIES TO THE WHOLE TEST, NOT TO PARTICULAR PROBLEMS)

ТОТА	L	10.0 out of 10.0
10.	. Analysis	1.0/10.0
9.	Materials	0.5/10.0
8.	Summary	0.5/10.0
7.	Calculations	2.0/10.0
6.	Procedure	2.5/10.0
5.	Data and variables	0.5/10.0
4.	Design considerations	1.0/10.0
3.	Sources	0.5/10.0
2.	Drawings	1.0/10.0
1.	Purpose	0.5/10.0

PROBLEM 1)

1.	Thermal circuit	
a.	8 resistances	1/14 of 1/14
b.	Q from sun to correct node	1/14 of 1/14
2.	Compute individual resistances	
a.	Correct areas in the convect resistances	1/14 of 1/14
b.	Shape factor (justification)	1/14 of 1/14
c.	Glass & tube resistance (right eq)	0/14 of 1/14
d.	Absorber resistance is negligible	0/14 of 1/14
3.	Conservation of energy equation	1/14 of 1/14
4.	Solving for absorber temperature	2/14 of 2/14
5.	Q to water	0/14 of 1/14
6.	Temp of trapped air	1/14 of 1/14
7.	Water mass flow rate	0/14 of 1/14
8.	Collector efficiency	0/14 of 1/14

9.	Final result	0/14 of 1/14
тот	FAL	14/14 of 14/14

PROBLEM 2)

TOTAL		2/6 of 6/6	
5.	Final results		0/6 of 1/6
4.	Solving for k		1/6 of 2/6
3.	m as a function of k		1/6 of 1/6
2.	A=? P=?		0/6 of 1/6
1.	Justification to pick T e	quation	0/6 of 1/6

FINAL GRADE:

10.0 + 55*(7/14) + 25*(2/6) = 45.83