Questions and Answers

ECE 2300 – February 4, 2014 – Dr. Dave Shattuck

C: I think I followed your lecture today because Dr. T. covered a lot of this in the 1100 class.

R: Wonderful! Please tell him directly, so that he can know that what he is doing helps.

Q: What is the strategy for making closed loops and closed surfaces?

A: Generally, the goal is to get equations that involve the unknowns you want to solve for, and to get independent equations.

Q: I just wanted to double check, active convention affects power and what else?

A: We use the sign conventions, active sign convention and passive sign convention, to get the correct sign in power equations and Ohm’s Law. We will later use these to help us write equations for inductors and capacitors, as well.

C: I like how you ask us questions when we ask questions, because it allows us to think for ourselves.

R: Great. That is why I do it.

C: Unable to ask. My head hur…

R: That pain you are feeling is your brain being stretched. It is normal and healthy.

Q: What is the difference between a closed loop and a closed surface? I do not get it.

A: Since I answered this question directly in class, I would suggest that you talk this over with someone. If you want to talk about it with me, come by my office.

Q: How can I know whether something is absorbing power? Like the car battery problem in Homework #1. Mathematically and theoretically.

A: You write an equation for the power, for example for the power absorbed, and look at the sign of the answer you get. If the sign for the power absorbed by something is positive, we say that this something is absorbing power. This should make sense, because it means that the charges are moving from a higher potential energy to a lower potential energy, which in turn means that the something where this is happening has energy being lost from the electrical system in that something. This is what we mean when we say something is absorbing power. I am not sure whether this is mathematical or theoretical, but I am not sure how else to say it.

Q: What happens when there is an unclear voltage drop like with *vX* in Problem 0.8 in Homework #2? Worded differently, how do we read that in relation to the circuit?

A: I just viewed this problem again. I do not think that this voltage is unclear. It is the voltage between the node at the left hand side of the 15[Ohm] resistor, and the bottom of the 20[V] voltage source. Can you ask this again in a different way?

Q: Last time I told you that I loved you. You told me that you loved your wife. Frankly, I’m a little hurt. What am I going to do with 1.25 carat platinum diamond engagement ring from Jared?

A: Frankly, I am hurt that you are hurt. Still, there are a number of options available to you. I suggest that sites such as Match.com, and “It’s Only Lunch”, are anxious to help you. You need to channel your affection in more appropriate venues. Once you do, then tell the people on the plane, and they will tell everyone you went to Jared! Think how much fun that will be!

Q: How does *vX* in the example from class, relate to the real world? What would be an example for it?

A: There are many, many places where a voltage with nothing connected (yet) are of interest. One example I gave in class was the power outlet right in front of you in class, before you plug something in. There is a voltage across the terminals there, but no current flowing, and effectively nothing else there, until you connect something to that outlet. There is the headphone jack on your cell phone, before you plug something in. A D cell battery that is still in the package. I could go on and on.

Q: Why is *vY* = -100[Ohm] *iY*? I thought active/passive sign conventions were for power?

A: It is because the sign conventions are also used to determine the sign for Ohm’s Law. They are for power, but they are also used in other places.

C: Things are much clearer when you take this course for the second time. Unfortunate, but true!

R: Fair enough. However, it is going to be very important for you to get the same result in one attempt for future courses. Try to figure out why it is clearer, and how to get this level of understanding the first time you take a course. Usually, more time on task, with high motivation, is a big help. But that is only one part of the solution.

C: This Q&A 5x8 card thing is an awesome idea. I learned multiple things from the first one you posted, and found myself reading all of it.

R: I am glad you like it. I stole this idea from Dr. Paskusz, and adapted to my own purposes. I have fun with it.

C: Please, I am afraid at the pace we are going we will have no time to do complex stuff in class.

R: I assume from this comment that you are referring to Complex Power, the last topic for the semester. Should I continue with so many students who fail to understand voltage, current, power and resistance? Trust me; they will not get anything unless these basics are established. I have to strike a balance with my pacing.

I will say it another way. If you do not understand this stuff, then you will fail the course. If you do not understand the complex stuff, you can still earn a B in the course. What, then, is most important?

C: In the final example we did in class, it was still unclear why the equation was wrong even when using the correct sign convention.

R: You must have missed something. When we used the correct sign convention, we got a valid equation.

C: I am still confused on your choice of direction in the second closed surface. I understand that it is arbitrary and I don’t know if it would be less confusing in a test to choose an arbitrary easy direction.

R: You need to do problems until you believe that there is no “easy” reference direction. Neither option is easier than the other option. When I say arbitrary, I really mean it.

Q: What is happening with the current when in a graph that describes its behavior with time, the slope is equal to zero?

A: It means that the current is constant during that time interval.

Q: How do I identify nodes?

A: You draw blobs around the places where components are connected together. When two blobs are connected by a wire, make them one blob. When you are done, you have identified the nodes. They are the blobs.

C: Thanks for showing us the blob thing with the nodes. That really helped with counting them.

R: Great! Can I ask you to explain this to the previous student?

Q: Why DON’T you write your own textbook?

A: Because it takes a huge amount of time, there is relatively little financial reward for doing so, and the university is paying me really well for what I am doing right now. I have tried writing. I like it, but it is really hard to do a good job. Still, I harbor hopes that someday things will calm down, and I will have a chance to do it.

Q: How many times can we ask the same questions?

A: It is hard to say. The same question was asked three times last class, and it seemed to be OK.

Q: OK, Dr. Dave, if we have the circuit from last time, we found that *iY* = 0, right? So, if were to redraw this circuit, that would mean that the dependent current source that depends on *iY* would be shorted?

A: No. It would mean that the dependent current source that depends on *iY* would be open-circuited. This is very different.

C: This class is fun!

R: I have always thought so! I am very pleased that you agree!

C: I am unclear about counting the nope.

R: Just keep track of how many times I answer a question with a negative.

Q: Can we do more KCL and KVL questions?

A: You may do as many of them as you wish! Be my guest!

Q: Would it have been necessary to include the correct sign for 100[Ohm] *iY* since *iY* = 0?

A: Yes, it would be necessary to include the correct sign. This is because the equation might be used in a case where *iY* was not zero, and then the sign would matter. So, let us work to always have the correct sign.

Q: Why do parallel resistors have the same voltage?

A: By definition.

Let me say that again in a different way. We define two things to be in “parallel” as two things “having the same voltage across them”. So, of course, if two resistors are in parallel, they will have the same voltage across them. That is how we know they are in parallel.

I am guessing that you had some other definition of parallel in mind. If so, then get it out of your mind. Parallel means the same voltage.

Q: What is the best way to study for this class? I ask because just reading your notes and textbook reading and jumping on the homework seems extremely hard and time consuming.

A: I think that the best way to study for this class is to read the textbook, read the lecture notes, come to class alert and ready to think and write things down, and then begin working on homework problems. Work on some of the problems by yourself, and work on some of them with other students. Then, look at old exams and quizzes. When you think you understand things, work some of those problems under time limits, without looking at the solution, and with a self-imposed penalty for poor performance, so that you can practice being nervous. Come to office hours and ask questions when you are stumped.

Yes, this is extremely hard and time consuming. On the first day of class, I told you that this course would be extremely hard and time consuming. I told you that, because this course is extremely hard and time consuming. The courses that follow this one are extremely hard and time consuming. Welcome aboard. I suspect that this is why the jobs for engineers have high pay levels, and why some students do not make it through. What I can tell you is, I do not know any shortcuts. If you know about them, please tell me, and I will spread the word.