Questions and Answers

From ECE 2300 class, February 18, 2013

Q: On HW #3 problems 0.1 and 0.2, when it asks for the resistance *RMA* or *RMV*, is it asking for the internal resistance of the d’Arsonval meter movement, or of the boxed area.

A: Good question. In both problems, it is asking for the resistance of the meter shown in the boxed area. How could you know, since it is not defined in the diagram? You know from the wording of the problem. When it asks, “What is the resistance *RMV* of this voltmeter?”, it is defining *RMV* by that very statement.

Q: When trying to find *REQ* from terminal A to B from the example worked in class, I end up with 2-3 unknowns and I have no idea what to do with them.

A: This is troubling. In the approach I follow with such problems, I never have unknowns; I just develop new resistance values. Where are your unknowns coming from? You might wish to come in to show me your work, so I can see what is going on here.

Q: How do you find a meter’s resistance when it is not given? Ohm’s Law?

A: Yes. (I love these easy questions!)

Q: For the equivalent resistance questions, do we need to draw the voltage source in the circuit diagram?

A: No, you do not. I would point out that you may not be connecting a voltage source. You may be connecting a current source. You may be connecting an elephant. You do not know. However, you do know you are going to connect something. Some people like to put in a box to make that clear, which would be better than a voltage source. However, you do not need to do so.

Comment: I am very unclear on the first example we did on equivalent resistance. I need more practice.

Reply: Excellent analysis! I think you are exactly correct! More practice would likely help a great deal.

Q: How does adding a resistor in parallel with an ammeter extend its range?

A: Adding a resistor in parallel with an ammeter gives an alternative path for some of the current to flow. This means that less current will flow through the ammeter, allowing more current to flow through the parallel combination before hitting the limit for the ammeter. We call this “providing a shunt pathway”, where in this context “shunt” means “in parallel”.