PH 122: Assignment #4  

Circuits

Details

This assignment will be due in class on Wednesday, February 26. Please hand it in using the boxes in the rear of the classroom. Assignments will be returned in lab the following week.

Make sure that we can trace the work that you’ve done:

- When you answer questions, please show your reasoning.
- When you answer multiple-choice questions, please show all of your work.
- Please answer problems in three steps, “Prepare”, “Solve” and “Assess”

Problems

Chapter 23: Circuits

Topic #1: Resistor Circuits

Questions: 4, 5, 17  
Problems: 10, 18, 62, 64, 68

Topic #2: Capacitor Circuits

Questions: 27  
Problems: 40, 78

Passage Problem (solve as one problem): 82-85

Topic #3: Nerve Conduction

Questions: 28, 36  
Problems: 48

Chapter 26: AC Electricity

Topic #1: Safety

Questions: 10  
Problems: 28

Past Exam Problem

Tracking Temperature

Monitoring of temperatures in electronic devices is often accomplished using thermistors, circuit elements whose resistance varies rapidly with temperature. The actual circuits are more complicated than the one at right, but it illustrates the basic principle. As the temperature of the thermistor rises, its resistance drops; a small rise in temperature leads to a large drop in resistance. At 25 °C, the thermistor has a resistance of 3.0 kΩ. As the temperature rises to 60 °C, the resistance drops to 200 Ω. This changes the voltage measured by the meter—an electrical quantity that can be easily monitored.

- What is the reading on the voltmeter at 25 °C?
- What is the reading on the voltmeter at 60 °C?

Grading

We will grade 2 items.

If we grade a question, we'll give it 0, 1 or 2 points. We’ll assign points as follows:

2 = essentially all correct; 1 = partially correct; 0 = mostly incorrect.

If we grade a problem, we’ll give it 0, 1 or 2 points. We’ll give 1 point for “Prepare” and 1 point for “Solve”. The “Assess” step will work as a fail safe. If you didn't get the solution quite right but your “Assess” step was thoughtful and well reasoned, you can still get the full 2 points.

We'll assign 1 “Completeness Point” - with “Completeness” broadly interpreted. You need to make a serious effort on all the problems, do legible and complete work throughout, and staple your pages together.

Additional Practice

If you want additional practice, you can try the following problems:

Chapter 23:

Problems: 7, 17, 23, 29, 41, 49, 55, 61