**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ PHY2049C, Quiz 6**

**A- Read all the quiz once, or twice, before beginning to write. Make sure to comprehend all questions and start with those you fell most confident.**

**B – Be clear and concise. There are no extra points for being verbose or writing extra.**

**C –Only use the white pages that I will provide. You have 60 minutes to answer the quiz.**

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**Problem 1**

Each resistor shown in the Figure has resistance R. An ideal emf device (an ideal battery) is connected to points a and b via two leads (not shown in the figure). Find an expression for the current through the emf device.

A circular black and white drawing

AI-generated content may be incorrect.

**Problem 2**

The circuit in the figure has been connected for a long time. (a) what is the potential difference between the plates of the capacitor? (b) If you disconnect the battery and close the circuit there, how long until the capacitor discharges one tenth of its original charge?

A paper with text and diagrams

Description automatically generated

**A circular object with lines and dots

AI-generated content may be incorrect.**

**Problem 3**

N real batteries, each with an emf and Internal resistance r, are connected in a closed ring. A resistor R can be connected across any two points of this ring, causing there to be n real batteries in one branch and N — n resistors in the other branch. Find an expression for the current through the resistor R in this case.