Name
Physics 111 Quiz #3, January 24, 2025
Please show all work, thoughts and/or reasoning to receive partial credit. The quiz is worth 10 points total, and all parts may not be of equal weight.
I affirm that I have carried out my academic endeavors with full academic honesty.
An air-filled parallel-plate capacitor is constructed from two circular metal plates with radius $10cm$ separated by a distance of $1mm$. The initially uncharged capacitor is connected to a $R = 100M\Omega$ resistor and a $50V$ battery.
1. What is the maximum amount of charge that can be stored on the capacitor when it is fully charged?
2. What is the magnitude and direction of the electric field between the capacitor plates?

3.	Suppose that after the capacitor is fully charged the battery is removed. The capacitor is then connected to the $100M\Omega$ resistor and allowed to discharge. What is the time constant for the discharging circuit?
1	What is the voltage across the capacitor 4ms after it begins to discharge?
7.	what is the voltage across the capacitor 1ms after it begins to discharge.
5.	At a time 4ms after the capacitor begins to discharge, how much energy has been dissipated across the resistor?