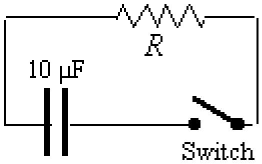
Phys 132 - Fund Phys 2 - Homework 11 Name: ____________________________
Wednesday, Feb 28, 2007

1. Three parallel plate capacitors, each having a capacitance of 1.0 μF are connected in parallel. The potential difference across the combination is 100 V. What is the equivalent capacitance of this combination?
A) 0.3 μF
B) 1 μF
C) 3 μF
D) 6 μF
E) 30 μF

The figure shows a simple RC circuit consisting of a 10.0-μF capacitor in series with a resistor. Initially, the switch is open as suggested in the figure. The capacitor has been charged. The potential difference between its plates is 100.0 V. At t = 0 s, the switch is closed. The capacitor discharges exponentially so that 2.0 s after the switch is closed, the potential difference between the capacitor plates is 37 V. In other words, after 2.0 s the potential difference between the capacitor plates is reduced to 37 % of its original value.



2. Calculate the charge Q stored in the capacitor before the switch is closed.
A) 1000 C
B) 0.1 C
C) 1×10^{7} C
D) 1 mC
E) 1 C

3. Determine the potential drop (i.e. voltage) across the resistor R at t = 2.0 s (i.e., two seconds after the switch is closed).
A) zero volts
B) 37 V
C) 63 V
D) 87 V
E) 100 V

4. Determine the numerical value of the resistance R. (Hint: find the time constant from the way the voltage changes.)
A) 1.0×10^{5} Ω
B) 2.0×10^{5} Ω
C) 5.0×10^{5} Ω
D) 1.0×10^{6} Ω
E) 2.5×10^{6} Ω