

Quiz #9

Name: _____

1. A capacitor has a charge of -50 Coulombs on one plate. What is the charge on the other plate? _____
2. The two plates of a capacitor ($C = 300 \times 10^{-6}$ F) have voltages differing by 7 V. What is Q , the magnitude of charge on each plate? $Q =$ _____
3. A capacitor ($C = 400 \times 10^{-6}$ F) is allowed to discharge through a resistor ($R = 30$ k Ω). What is the time constant for this pair, in seconds?

Time constant = _____ seconds

4. A capacitor starts out at 10 Volts, and then begins to discharge through a resistor. What is the voltage after one time constant has passed?

$V(\text{one time constant}) =$ _____

5. A capacitor starts out at 10 Volts, and then begins to discharge through a resistor. What is the voltage after two time constants have passed?

$V(\text{one time constant}) =$ _____

Problems 6 through 9: A power supply, set to 20.0 V, is used to charge a capacitor that starts out at 0 Volts. A resistor $R = 400$ k Ω is used to control the rate of charging, and the time constant is $\tau = 10.0$ seconds.

6. What is the capacitance in μF ? _____ μF
7. What is the voltage across the capacitor when $t = \tau$? _____ V
8. What is the voltage across the capacitor when $t = 2\tau$? _____ V
9. The lab technician starts charging the capacitor on Friday afternoon, and it charges all weekend. When the technician arrives on Monday morning, what is the voltage across the capacitor? _____ V