Name: _____ **Date of Lab:** _____

Partner: _____

Power Supply setting V_{max} (use voltmeter): V_{max} = _____ V

Nominal Value of your capacitor: C_{nom} = _____ mF

Value of your resistor (from ohmmeter): R = _____ ± _____ kΩ

Nominal time constant $\tau = RC$: τ_{nom} = _____ s ($\tau_{goal} \approx 90$ - 100 s)

Part I: Discharging $V(t) = V_{max} e^{\frac{-t}{RC}}$ and $\ln(V) = \frac{-t}{RC} + \ln(V_{max})$

Slope of ln(V) vs. t: *slope* = _____ ± _____ s^{-1}

Intercept of ln(V) vs. t: *intercept* = _____ ± _____ -

Computed V_{max} from intercept: V_{max} = _____ ± _____ V

Computed time constant: τ = _____ ± _____ seconds

Computed capacitance: C_1 = _____ ± _____ mF

Part II: Charging $V(t) = V_{max}\left(1 - e^{\frac{-t}{RC}}\right)$ and $\ln(1 - \frac{V}{V_{max}}) = \frac{-t}{RC}$

Estimate: $V_{final} \rightarrow V_{max}$ V_{max} = _____ ± _____ V

(but use the "true" V_{max} in Excel to create a column $f = 1 - \frac{V}{V_{max}} \ldots$)

Slope of ln(f) vs. t: *slope* = _____ ± _____ s^{-1}

Computed time constant: τ = _____ ± _____ seconds

Computed capacitance: C_2 = _____ ± _____ mF

Discuss what you think is the best value for *C*: _____