**Lab 5 - RC Circuit**

**Charge on the Capacitor**

\[ Q(t) = q_0(1 - e^{-t/\tau}) \]

**Voltage Across Capacitor**

\[ V_c(t) = V_0(1 - e^{-t/\tau}) \]

**Charging Process**

\[ V = IR + \frac{Q}{C} \]

**Charge**

\[ Q = Q_{\text{max}}(1 - e^{-t/\tau}) \]

**Charge-Time Graph**

- \( t_0 \) to \( t_1 \)
- \( t_1 \) to \( t_2 \)
- \( t_2 \) to \( t_f \)

**Experiment**

- **Power Add**
  - Positive Square Wave
  - \( 4 \text{V} \) @ 0.1Hz
- **Sampling Options**
  - Auto Stop @ 20 sec.
- **Graph**
  - Voltage vs Time
  - Decimals ~ 5
  - Max Charge: \( Q_0 = C_{\text{max}} \times V_{\text{max}} \)

**Lab Report**

- Cover Sheet, Questions
- Z Plots
  - Fig 1: Charge/Discharge of \( C \)
  - Fig 2: Half-Life (t/2)

**Note**

- \( \Delta = t_f - t_0 \) from Smart tool

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