RC Summary

Charging

$$q(t) = q_\infty(1 - e^{-t/RC})$$
$$V(t) = V_\infty(1 - e^{-t/RC})$$
$$I(t) = I_0 e^{-t/RC}$$

Discharging

$$q(t) = q_0 e^{-t/RC}$$
$$V(t) = V_0 e^{-t/RC}$$
$$I(t) = I_0 e^{-t/RC}$$

Time Constant τ **= RC**

Large τ means long time to charge/discharge

Short term: Charge doesn't change (often zero or max)

Long term: Current through capacitor is zero.