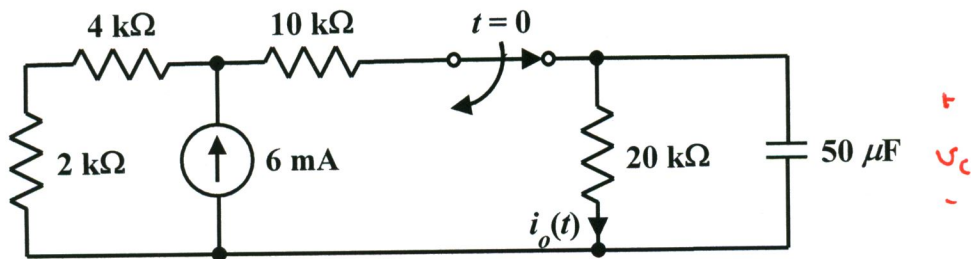


EE 2240
Problem #07

The circuit has reached the DC steady state prior to $t = 0$. Find $i_o(t)$ for $t \geq 0$.



$$V_c(0) = \frac{6}{36} \cdot 6 \text{ mA} \cdot 20 \text{ k}\Omega = 20 \text{ V}$$

$$i_o(0^+) = \frac{V_c(0)}{20 \text{ k}\Omega} = 1 \text{ mA}$$

$$\tau = (20 \text{ k}\Omega)(50 \mu\text{F}) = 1 \text{ s}$$

$$i_o(t) = i(0^+) e^{-t/\tau}$$

$$= e^{-t} \text{ mA}, \quad t \geq 0$$