Problem #04
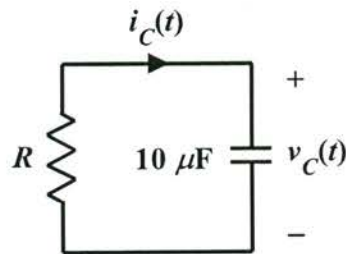
The capacitor current, $i_c(t)$, in the circuit shown below is

$$i_C(t) = 50e^{-5t} \ \mu A \quad \text{for } t \geq 0.$$

Determine the value of R and the initial value of $v_C(t)$.

$$\frac{1}{R(10\mu F)} = 5 \quad \Rightarrow \quad R = \frac{1}{5(10\mu F)} = 20k\Omega$$

$$v_c(t) = -R i_c(t) \quad \Rightarrow \quad v_c(0) = -(20k\Omega) i_c(0)$$

$$= -(20k\Omega)(50\mu A)$$

$$= -1 \ V$$