

Chapter 7, Solution 58.

$$\text{For } t < 0, \quad v_o(t) = 0$$

$$\text{For } t > 0, \quad i(0) = 10, \quad i(\infty) = \frac{20}{1+3} = 5$$

$$R_{th} = 1 + 3 = 4 \, \Omega, \quad \tau = \frac{L}{R_{th}} = \frac{1/4}{4} = \frac{1}{16}$$

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

$$i(t) = 5(1 + e^{-16t}) \, \text{A}$$

$$v_o(t) = 3i + L \frac{di}{dt} = 15(1 + e^{-16t}) + \frac{1}{4}(-16)(5)e^{-16t}$$

$$v_o(t) = 15 - 5e^{-16t} \, \text{V}$$