Chapter 7, Solution 17.

Consider the circuit of Fig. 7.97. Find $v_0(t)$ if $i(0) = 6$ A and $v(t) = 0$.

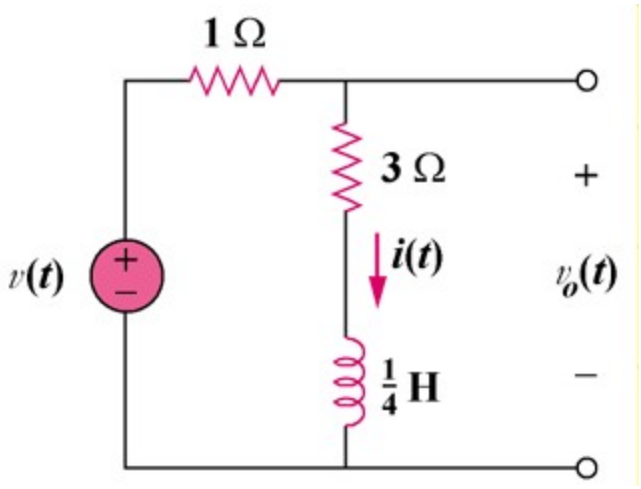

Figure 7.97
For Prob. 7.17.

Solution

$$i(t) = i(0)e^{-t/\tau}, \qquad \tau = \frac{L}{R_{eq}} = \frac{1/4}{4} = \frac{1}{16}$$

$$i(t) = 6e^{-16t}$$

$$v_o(t) = 3i + L\frac{di}{dt} = 18e^{-16t} + (1/4)(-16)6e^{-16t}$$

$$v_o(t) = \mathbf{-6e^{-16t}u(t)\ V}$$