3.63 For the series RLC circuit shown in Fig. P3.63, suppose that \( R = 7 \, \Omega, \, L = 1 \, \text{H}, \, C = 0.1 \, \text{F} \); \( v_i(t) = 12 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 0 \, \text{V} \) for \( t \geq 0 \) s. Find \( v(t) \) and \( i(t) \) for all time.

3.64 For the series RLC circuit shown in Fig. P3.63, suppose that \( R = 2 \, \Omega, \, L = 0.25 \, \text{H}, \, C = 0.2 \, \text{F} \); \( v_i(t) = 10 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 0 \, \text{V} \) for \( t \geq 0 \) s. Find \( v(t) \) and \( i(t) \) for all time.

3.65 For the series RLC circuit shown in Fig. P3.63, suppose that \( R = 2 \, \Omega, \, L = 1 \, \text{H}, \, C = 1 \, \text{F} \); \( v_i(t) = 6 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 0 \, \text{V} \) for \( t \geq 0 \) s. Find \( v(t) \) and \( i(t) \) for all time.

3.66 For the circuit shown in Fig. P3.66, suppose that \( v_i(t) = 6 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 0 \, \text{V} \) for \( t \geq 0 \) s. Find \( v(t) \) and \( i(t) \) for all time.

3.67 For the circuit shown in Fig. P3.67, suppose that \( v_i(t) = 6 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 3 \, \text{V} \) for \( t \geq 0 \) s. Find \( i(t) \) and \( v(t) \) for all time.

3.68 For the circuit shown in Fig. P3.67, interchange the inductor and the capacitor. Suppose that \( v_i(t) = 6 \, \text{V} \) for \( t < 0 \) s and \( v_i(t) = 0 \, \text{V} \) for \( t \geq 0 \) s. Find the capacitor voltage \( v(t) \) and the inductor current \( i(t) \) for all time.

3.69 For the parallel RLC circuit shown in Fig. P3.69, suppose that \( R = 0.5 \, \Omega, \, L = 0.2 \, \text{H}, \, C = 0.25 \, \text{F} \); and \( i_e(t) = 2a(t) \) A. Find the step responses \( i(t) \) and \( v(t) \).

3.70 For the parallel RLC circuit shown in Fig. P3.69, suppose that \( R = 3 \, \Omega, \, L = 3 \, \text{H}, \, C = \frac{3}{4} \, \text{F} \); and \( i_e(t) = 4a(t) \) A. Find the step responses \( i(t) \) and \( v(t) \).

3.71 For the series RLC circuit shown in Fig. P3.63, suppose that \( R = 7 \, \Omega, \, L = 1 \, \text{H}, \, C = 0.1 \, \text{F} \); and \( v_i(t) = 12a(t) \) V. Find the step responses \( v(t) \) and \( i(t) \).

3.72 For the series RLC circuit shown in Fig. P3.63, suppose that \( R = 2 \, \Omega, \, L = 1 \, \text{H}, \, C = 1 \, \text{F} \);