

1. (a)

$$i_L = \begin{cases} 0 & t < t_0 \\ \frac{V_{dc}}{L}(t - t_0) & t \geq t_0 \end{cases}$$

$$i_s = \begin{cases} 0 & t < t_0 \\ V_{dc}\left(\frac{t-t_0}{L} + \frac{1}{R}\right) & t \geq t_0 \end{cases}$$

(b)

$$i_L = \begin{cases} 0 & t < t_0 \\ I_{dc} & t \geq t_0 \end{cases}$$

$$v_R = \begin{cases} 0 & t < t_0 \\ I_{dc}R & t \geq t_0 \end{cases}$$

(c)

$$i_C = CV_{dc}\delta(t - t_0)$$

$$i_s = \begin{cases} 0 & t < t_0 \\ \frac{V_{dc}}{R} + CV_{dc}\delta(t - t_0) & t \geq t_0 \end{cases}$$

(d)

$$i_C = \begin{cases} 0 & t < t_0 \\ I_{dc} & t \geq t_0 \end{cases}$$

$$v_R = \begin{cases} 0 & t < t_0 \\ I_{dc}R & t \geq t_0 \end{cases}$$

2. (a)

$$i(t) = \begin{cases} \frac{V_{s2}}{R_1} \left(1 - e^{\frac{-tR_1R_2}{L(R_1+R_2)}}\right) & t < t_0 \\ \frac{V_{s1}(t-t_0)}{L} + i(t_0) & t \geq t_0 \end{cases}$$

(b)

$$V_C(t) = \begin{cases} \frac{CR_2V_{s2}}{R_1+R_2} \left(1 + e^{\frac{-t(R_1+R_2)}{CR_1R_2}}\right) & t < t_0 \\ I_{s1}R_1 + (V_C(t_0) - I_{s1}R_1)e^{\frac{-(t-t_0)}{RC}} & t \geq t_0 \end{cases}$$

3.

4.

$$v_l(t) = \begin{cases} \frac{V_sR_2}{R_1+R_2} \left(1 - e^{\frac{-t(R_1+R_2)}{L}}\right) & t < t_0 \\ \frac{V_sR_2}{R_1+R_2} e^{\frac{-(t-t_0)R_2}{L}} & t \geq t_0 \end{cases}$$