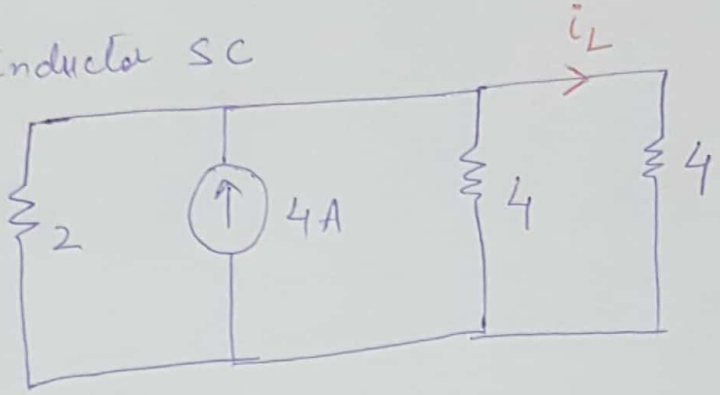
Quiz-05 Section 01

Solution

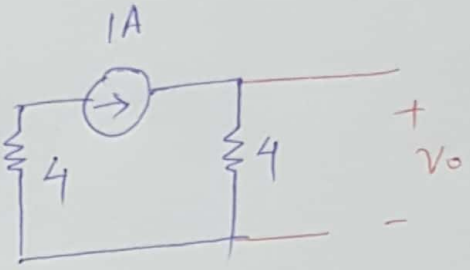
At $t=0^-$

Inductor SC



$i_L(0^-) = 1A$, $v_o(0^-) = 4V$

At $t=0^+$



$v_o(0^+) = 4V$

At $t=\infty$

$v_o(\infty) = 0$

Time constant: $\tau = \frac{L}{R_{eq}}$ $\quad R_{eq} = 4+4 = 8\,\Omega$

$\Rightarrow \tau = \frac{1}{2}$ sec

$v_o(t) = K_1 + K_2 e^{-t/\tau}$ | $K_1 = 0$, $K_2 = 4$

$= 4e^{-2t}$