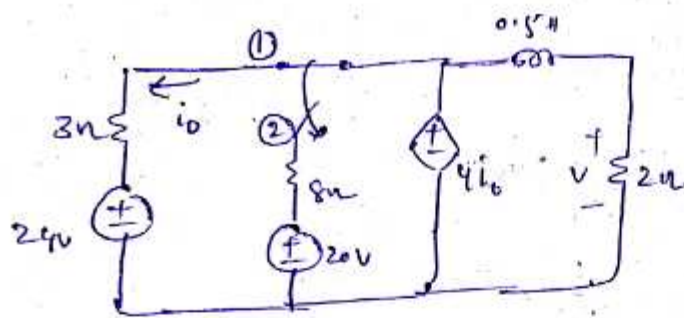


<< Search more Solutions!

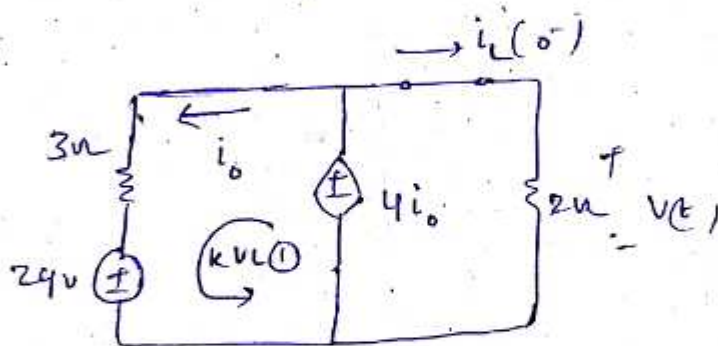
**Found Errors in Solution? >> [Report here!](#)**

**Answer**

Q. for  $t < 0$



for  $t > 0$  switch has been closed at position ② for long time so, inductor at DC steady state will get shorted.



$$\text{KVL } \textcircled{1} \Rightarrow -4i_o + 3i_o + 24 = 0$$

$$\therefore i_o = 24$$

$$\therefore v(t) = 24 \times 4$$

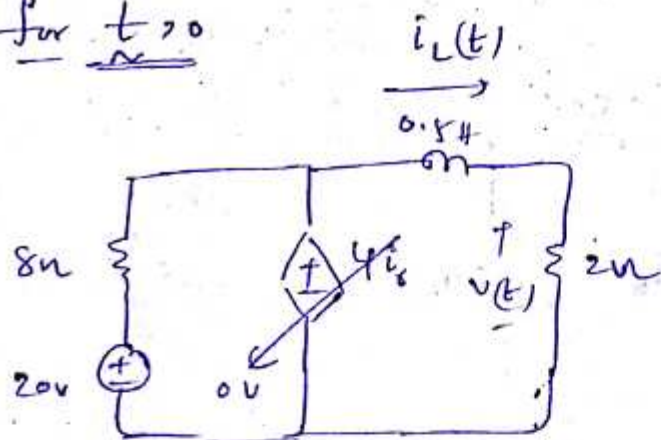
$$v(t) = 96 \text{ volts for } t < 0$$

$$i_L(0^-) = \frac{96}{2}$$

$$= 48 \text{ Amp}$$

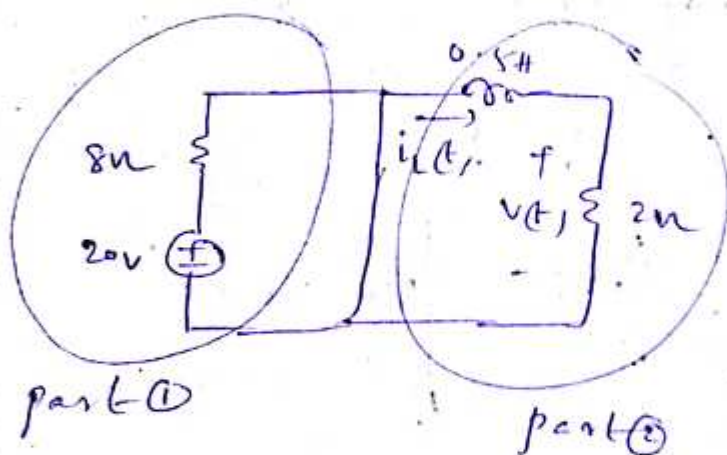


for  $t > 0$



Since switch moved to position ②

$$i_o = 0 \text{ so, } 4i_o = 0 \text{ volts}$$



part ① & part ② circuits are not interacting so,

part ② is just like a source free 1st order RL circuit

$$\text{So, } i_L(t) = I_L(0) e^{-\frac{t}{\tau}}$$

$$\tau = \frac{L}{R}$$

$$= \frac{0.5}{2}$$

$$= \frac{1}{2} \ln(5) e^{-\frac{1}{2}}$$

$$i_L(t) = 48 e^{-4t} \text{ Amp}$$

$$v(t) = 2 \times i_L(t)$$

$$v(t) = 96 e^{-4t} \text{ volts} \quad \text{for } t > 0$$



**Likes: 2**

**Dislikes: 0**

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