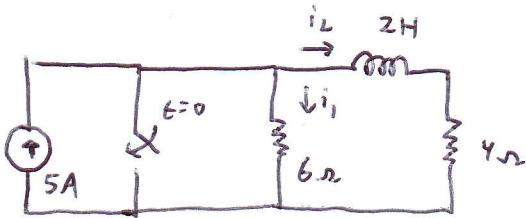Ralat bagi TE-1
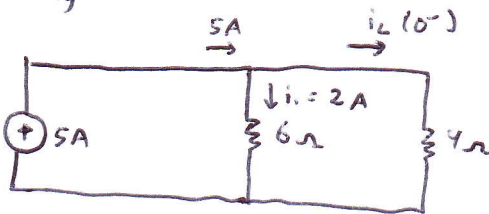
1)

Jika $i_1(0^-) = 2A$ tentukan

$i_L(0^-)$, $i_L(0^+)$, $i_1(0^+)$ dan $\dfrac{di_L(0^+)}{dt}$
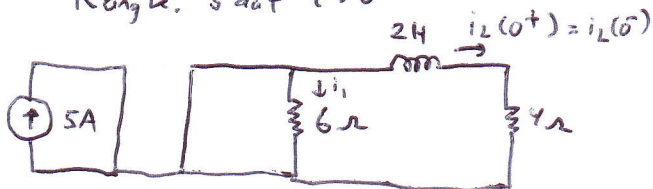
Jawab:

Rangk. saat $t=0^-$

$i_L(0^-) = 5-2 = 3A$

Rangk. saat $t=0^+$

$i_1(0^+) = 0$ Karena $R=6\Omega$ short

Rangkaian diatas dapat digambar sbb:
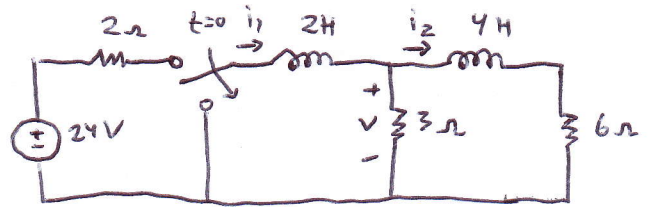

Menggunakan KVL:

$L\dfrac{di_L}{dt} + 4 \cdot i_L = 0$ $i_L(0^+) = 3A$

$2\dfrac{di_L}{dt} + 4 \cdot 3 = 0$

$\dfrac{di_L}{dt} = -\dfrac{12}{2} = -6 \text{ A/s}$
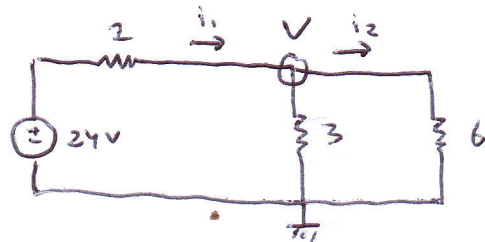
2).

Rangkaian steady state saat $t=0^-$.

Carilah v, i_1, i_2, $\dfrac{di_1}{dt}$ dan $\dfrac{di_2}{dt}$ saat $t=0^+$

Jawab:

Rangk. saat $t=0^-$

node V:

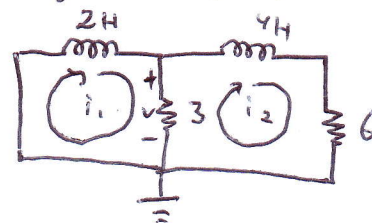$\dfrac{V-24}{2} + \dfrac{V}{3} + \dfrac{V}{6} = 0$ $\times 6$

$3V - 72 + 2V + V = 0$

$V = \dfrac{72}{6} = 12$

$i_1 = \dfrac{24-12}{2} = 6A$

$i_2 = \dfrac{12}{6} = 2A$

Rangk. saat $t = 0^+$

$i_1(0^+) = i_1(0^-) = 6A$

$i_2(0^+) = i_2(0^-) = 2A$

$V = 3(i_1 - i_2) = 12 V$

Loop i_1:

$2\dfrac{di_1}{dt} + V = 0$

$\dfrac{di_1}{dt} = -\dfrac{12}{2} = -6 \text{ A/s}$

Loop i_2:

$-V + \dfrac{di_2}{dt} + 12 = 0$

$\dfrac{di_2}{dt} = 0$