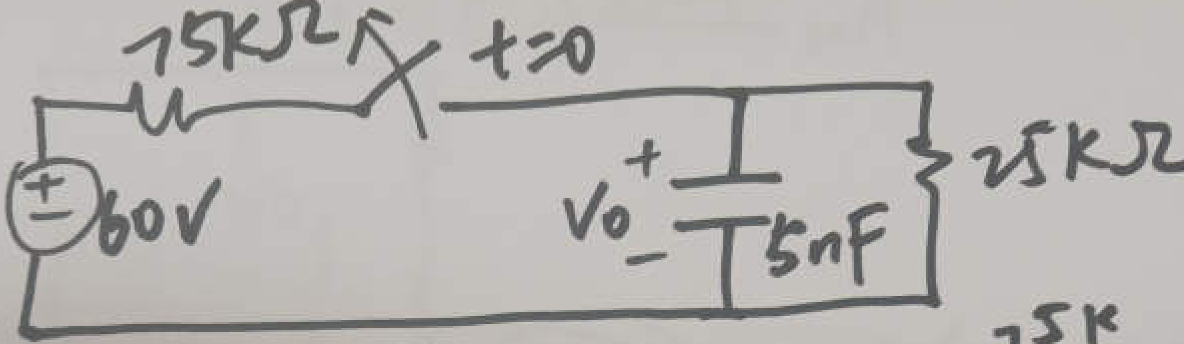
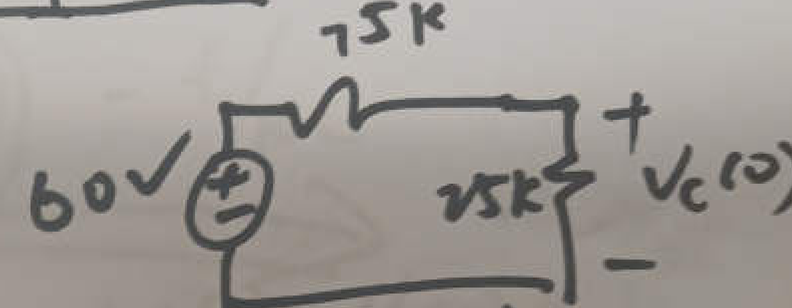
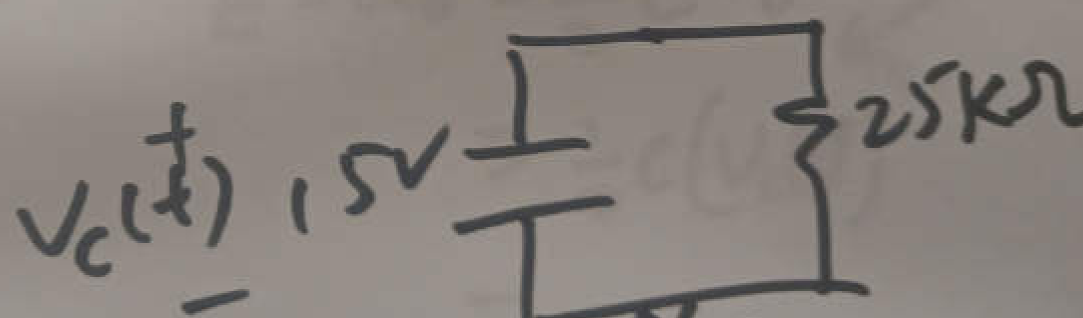


$$V_c(0^-) = 60 \cdot \frac{25K}{75K+25K}$$
$$= 15V$$



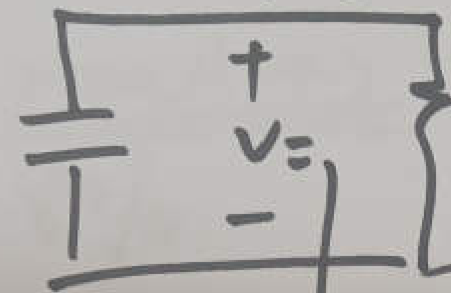
$$V_c(t) = V_c(\infty)(1 - e^{-t/RC})$$



$$V_c(t) = 15 \cdot e^{-t/RC}$$

C=5nF. R=25KΩ

$\rightarrow i = 5 \cdot e^{-1000t}$ mA



$100e^{-1000t}$

$-t/RC$

$V_c(t) = V_c(0) \cdot e^{-t/RC}$

$R = \frac{v}{i} = 20^{k}\Omega$

$C = ?$ $\begin{cases} \frac{1}{RC} = 1000 \\ R = 20k \end{cases}$

$C =$

$V_c(0) = 100V$

$E = w_0 = \frac{1}{2} C \cdot V^2$

$= \frac{1}{2} C (V_c(t))^2$

$=$

$\tau = RC$

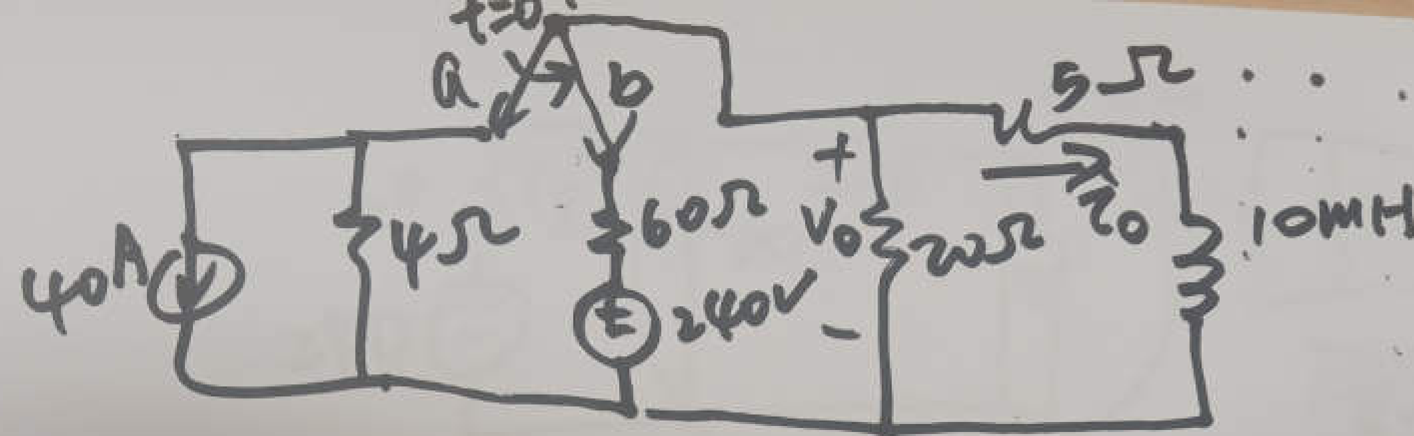
(2)

How long it takes to dissipate 80%

$$\frac{\frac{1}{2}C\,V_C^2(0) - \frac{1}{2}C\left(V_C(0)\cdot e^{-t/RC}\right)^2}{\frac{1}{2}C\,V_C^2(0)} = 80\%$$

$$= 1 - e^{-2t/RC} = \frac{4}{5}$$

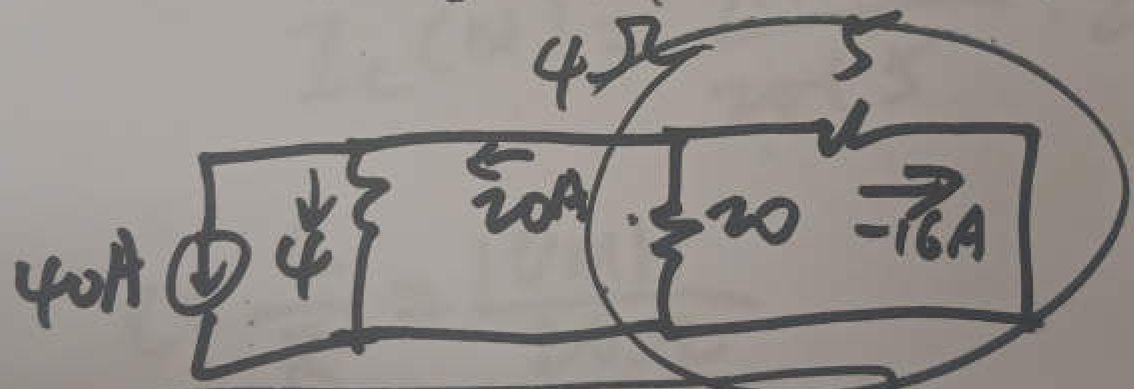
③



$i_0(t) = ?$ when $t \geq 0$

$i_0(0^-) = i_0(0^+)$

$\frac{5 \cdot 20}{25} = 4$



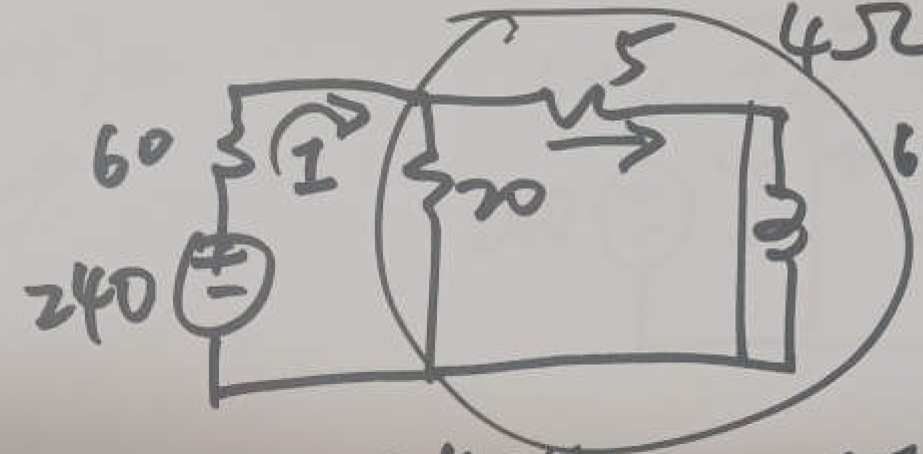
$\frac{-20A}{25} \cdot 20 = -16A$

$$I_L(t) = I_L(\infty) + (I_L(0) - I_L(\infty))e^{-t/\frac{L}{R}}$$

$I_L(0) = -16A$

$I_L(\infty) =$

4



$$\frac{20\cdot 60}{80}+5=20\Omega$$

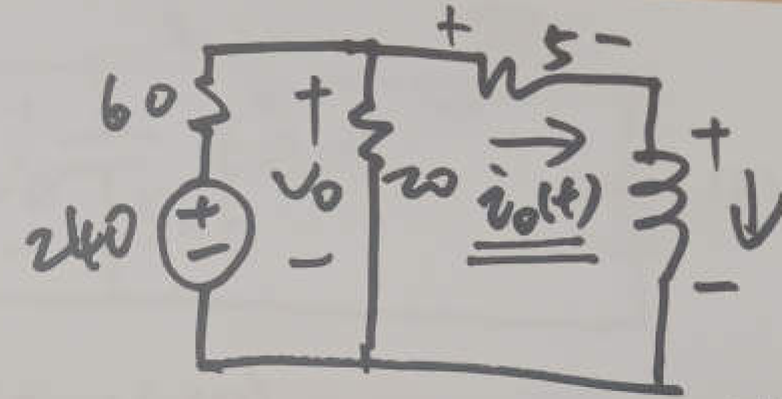
$$I = \frac{240}{60+4} = 3.75A$$

$$I_L(0) = \frac{3.75A}{20+5}\cdot 20 = 3A$$

$$\tau = \frac{L}{R} = \frac{10mH}{20\Omega}$$

$V_0(t) =$

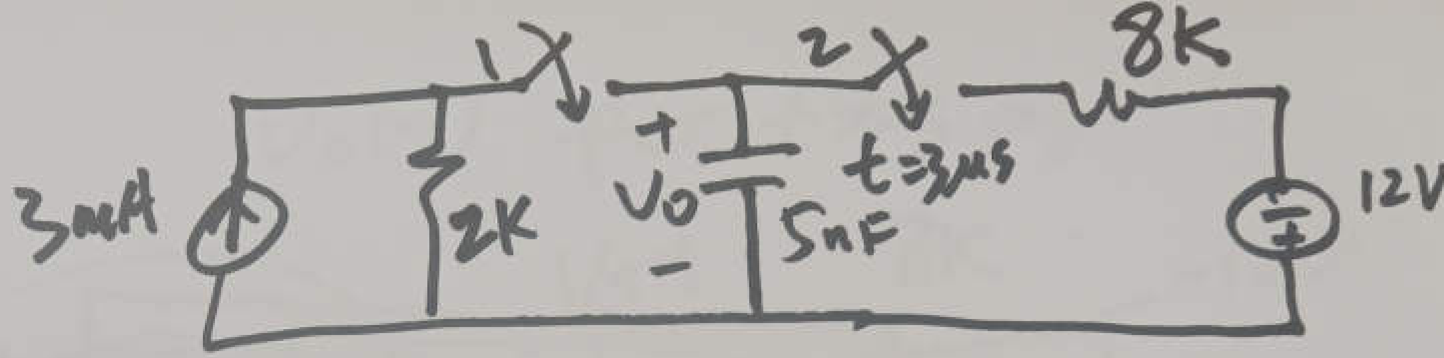
$t \geq 0^+$



$$V_L(t) = L\frac{di(t)}{dt}$$

$$= 5 \cdot i_0(t) + V_L(t)$$

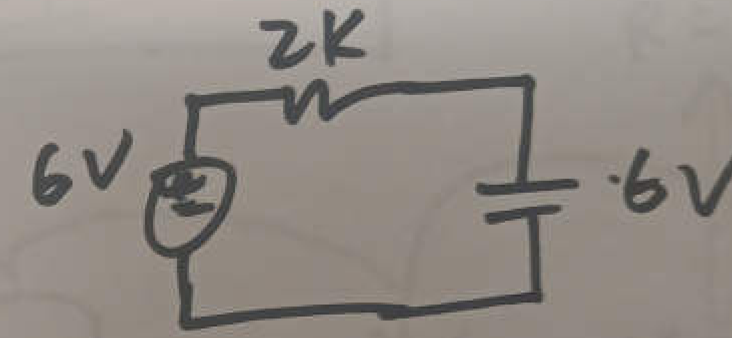
6



t=0, 1 closes. no $V_c(0)$

$0 < t < 3\mu s$

$V_c(t) = V_c(\infty)(1 - e^{-t/RC})$

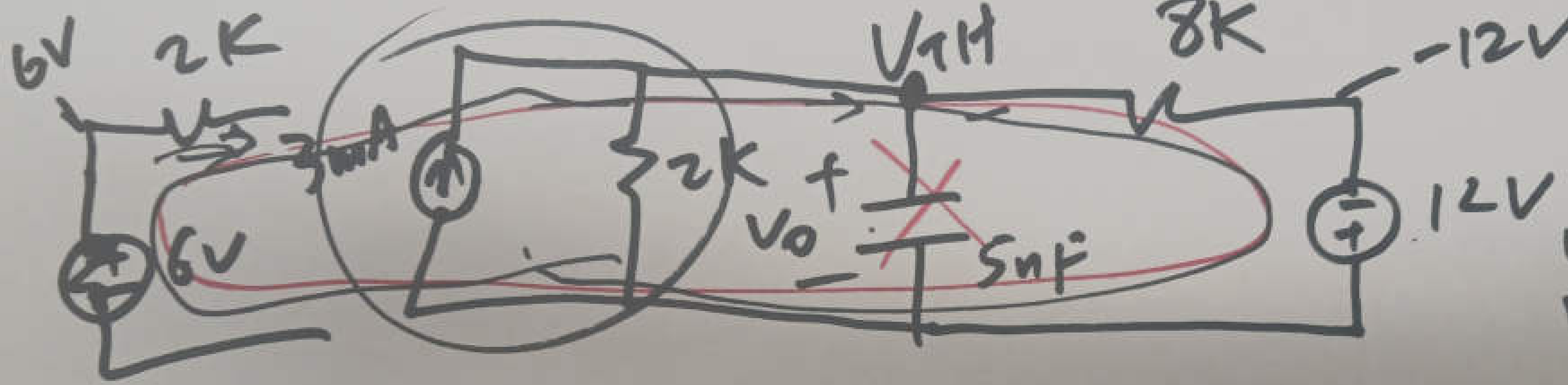


$= 6V \cdot (1 - e^{-t/10\mu s})$

$RC = 2K \cdot 5nF = 10\mu s$

$= 6(1 - e^{-t10^5})$

$V_o(t)$ for $t \geq 3\,\mu s$



$c = 5nF$

$R = 2K \| 8K$

$V_c(3\mu s)$

$$V_c(t) = V_c(\infty) + (V_c(0) - V_c(\infty))e^{-t/RC}$$

$t > 3\,\mu s$

$$6V - \left(\frac{6V - (-12)}{2K + 8K} \cdot 2K\right) = V_{TH}$$

1