

یاسغ یه وضیعه Vout ؟

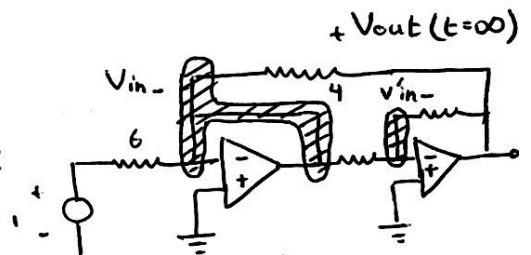
یاسغ یه : 
$$V_s = u(t) \xrightarrow{t > 0} u(t) = V_s = 1 \text{ V}$$

$$V_{out} = [V_{out}(t=0) - V_{out}(t=\infty)] e^{-\frac{t}{T}}$$

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

$t = 0^+$  → خازن فعال می شود  
یاب منع ولتاژ با مقدار ثابت  
اولیه

$V_c(0^+) = 0$  اتصال کوتاه

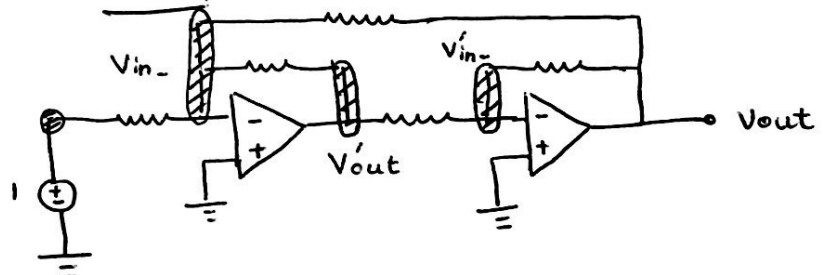


$$\Rightarrow V_{in-} = V_{in} = 0$$

$$\Rightarrow \text{Kcl in } V_{in-} : \frac{0-1}{6} + \frac{0-V_{out}}{4} + \frac{0-V_{in-}}{1} = 0$$

$$\Rightarrow V_{out}(t=0^+) = -\frac{2}{3}$$

$t = \infty$  → خازن مدار باز می شود



$$\text{Kcl in } V_{in-} : \frac{0-1}{6} + \frac{0-V'_{out}}{2} + \frac{0-V_{out}}{4} = 0 \Rightarrow 6V'_{out} + 3V_{out} = -2 \quad (I)$$

$$\text{Kcl in } V'_{in-} : \frac{0-V_{out}}{1} + \frac{0-V_{out}}{1} = 0 \Rightarrow V'_{out} = -V_{out} \quad (II)$$

$$(II) \text{ in } (I) \rightarrow V_{out}(t=\infty) = \frac{2}{3} \text{ V}$$

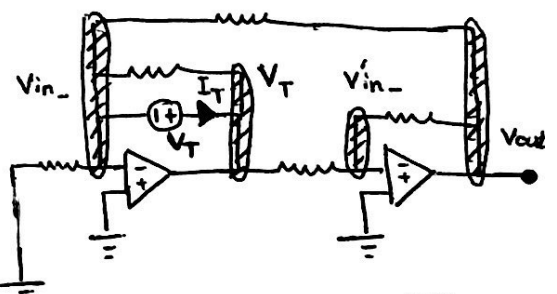
$$T = R_{TH} \times C$$

$$\text{Kcl in } V'_{in-} : \frac{0-V_T}{1} + \frac{0-V_{out}}{1} = 0 \Rightarrow V_{out} = -V_T \quad (I)$$

$$\text{Kcl in } V_{in-} : \frac{0-0}{6} + I_T + \frac{0-V_T}{2} + \frac{0-V_{out}}{4} = 0 \Rightarrow 4I_T - 2V_T - V_{out} = 0 \quad (I) \rightarrow$$

$$\Rightarrow 4I_T - 2V_T + V_T = 0 \Rightarrow \frac{V_T}{I_T} = R_{TH} = 4 \Omega \rightarrow T = \frac{1}{2} \text{ s}$$

$$V_{out} = \left[ -\frac{2}{3} - \frac{2}{3} \right] e^{-\frac{2t}{1}} - \frac{2}{3} \Rightarrow S(t) = \left[ \frac{2}{3} - \frac{4}{3} e^{-2t} \right] \times u(t)$$



$$\Rightarrow h(t) = \frac{ds(t)}{dt} = \left( \frac{8}{3} e^{-2t} \right) u(t) + \delta(t) \left( \frac{2}{3} - \frac{4}{3} e^{-2t} \right)$$

طبق خاصیت مذکور  
تابع ضرب

$$\rightarrow h(t) = \frac{8}{3} e^{-2t} \cdot u(t) - \frac{2}{3} \delta(t)$$