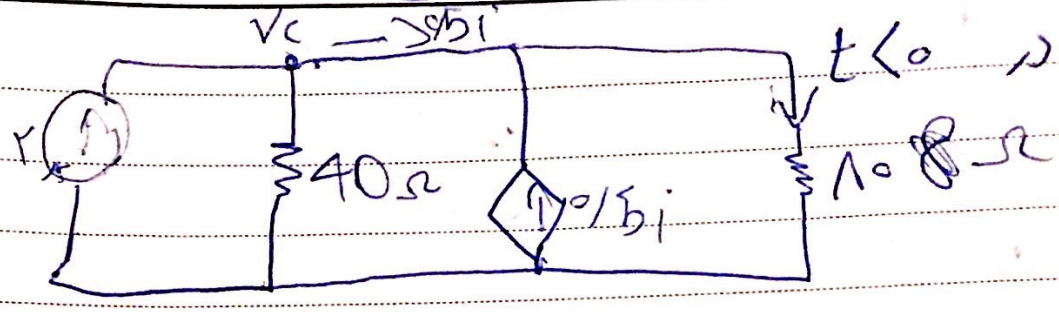
Subject:
Date

سپهر مقیسه ۹۸۳۱۱۰۳

۲- در $t<0$

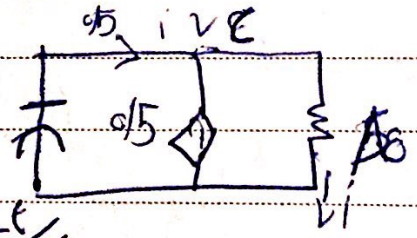


$$i = \frac{V_{c(0)}}{80}$$

$$KCL_{V_c}: -2 + 0/5i + \frac{V_c}{40} \Rightarrow V_c = 64$$

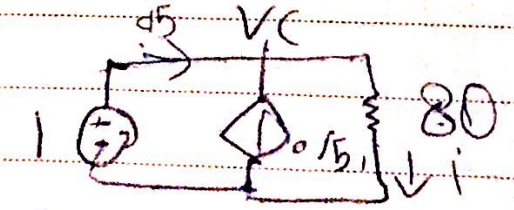
$$i = 0/8\ A$$

در $t>0$



$$V_c = V_0 e^{-t/\tau} \qquad \tau = RC$$

برای پیدا کردن R_{th} خازن را با منبع اولتی جایگزین می کنیم



$$i = \frac{1}{80} \qquad i_0 = 0/5i = \frac{1}{160}$$

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$R_{th} = \frac{1}{\frac{1}{10}} \Rightarrow 10\Omega$ $\quad \tau = RC = 480$

$v_c(t) = 4\varepsilon e^{-t/480}$

$i(t) = -i_c = -C\frac{dv}{dt} = \frac{-3}{480} \times 4\varepsilon e^{-t/480}$

$i(t) = \varepsilon/\Lambda\, e^{-t/480}\, u(t)\ A$

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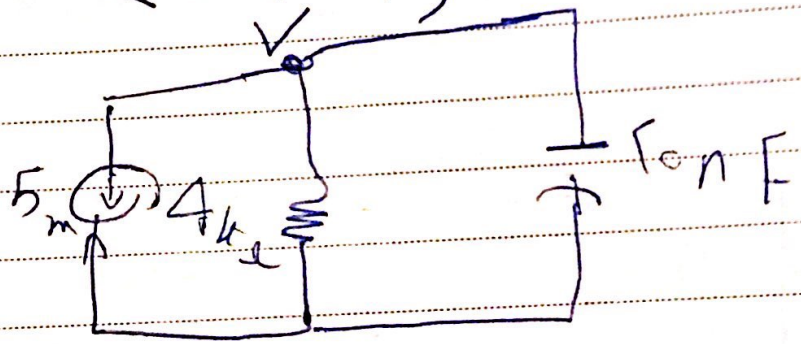
-۳

$0 < t < 10\ \mu s$



$KCL\ V = 5mA - i_C + \frac{V}{4k} = 0$

$i_C = -20 \times V'$ $\Rightarrow V = A\, e^{\frac{-t}{80\mu}} + k$

$\Rightarrow V(t) = 20\, e^{\frac{-t}{80\mu}} - 20$

$t = 10\ \mu s \rightarrow V = -4/42$

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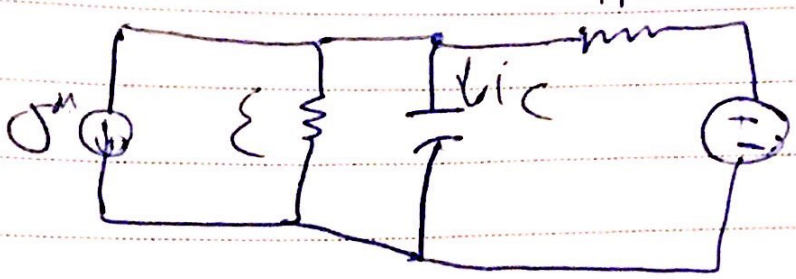

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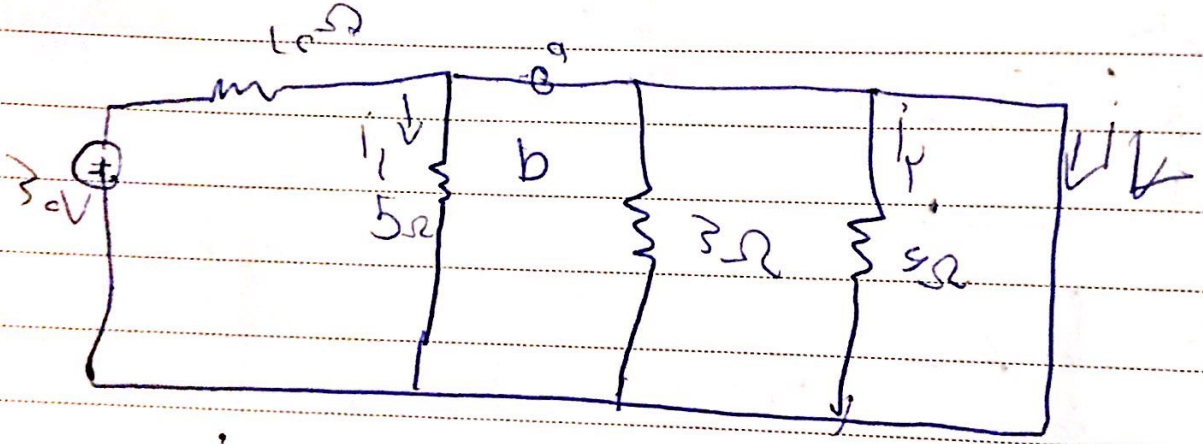
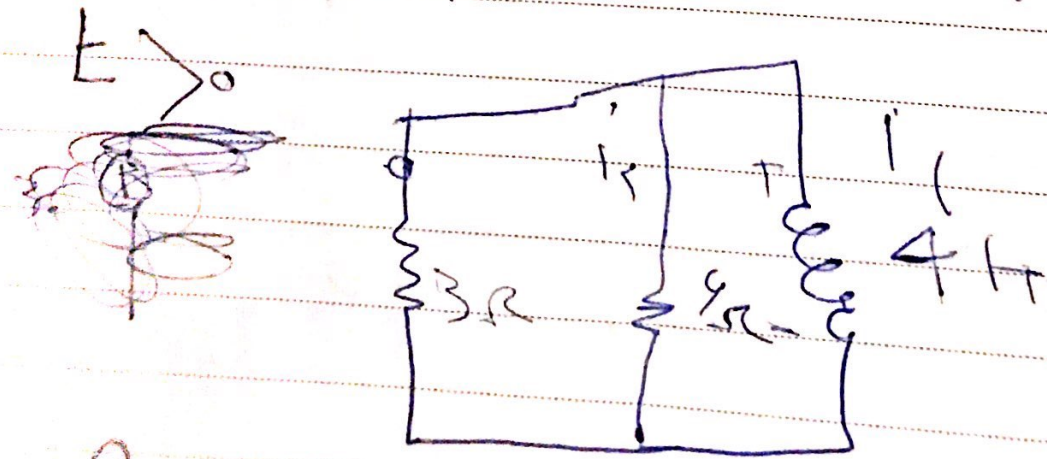
$t < 0$



$$i_L(0) = \frac{12}{10} = 2 \qquad v_o(0) = i_2(0) = i_1(0) = 0$$

$t > 0$



$R_{th} = 2$ $\Rightarrow$ $i_L(t) = 2e^{-\frac{t}{2}}$

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$i_1(\infty) = \frac{30}{15} = 2A$ — C

$V_o(\infty) = L \frac{di}{dt} = 0$

$i_2(\infty) =$

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Subject:
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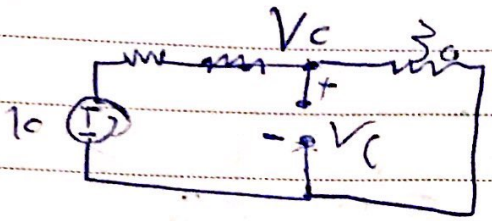
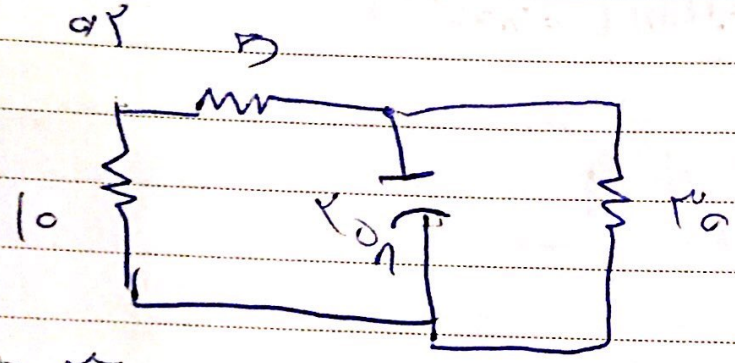
$t<0$ — ۵



$\Rightarrow \frac{V_c}{۳۰} + \frac{V_c - ۱۰}{۱۰} = ۰ \qquad V_c = \boxed{۷/۵}$

$۰ < t < ۰/۲$



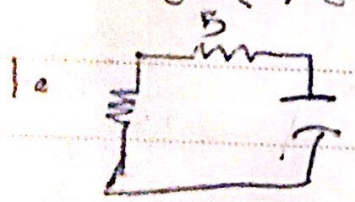
$\frac{۱۵+۳۰}{۱۵+۳۰} = ۱۰k\Omega \qquad \tau = RC \Rightarrow ۲۵n \times ۱۰k = ۰/۲۵$

$\frac{1}{\tau} = \boxed{4000}$

$V_c = \boxed{۷/۵\, e^{-4000t}}$

$V_c(۰/۲m) = ۳/۳۷V$

$۰/۲ < t < ۰/۸$



$\tau = ۳۷۵\ \mu s$

$V_c = ۳/۳۷ e^{-۲۶۶۶/۶(t - ۲۰۰ \times ۱۰^{-۶})}$

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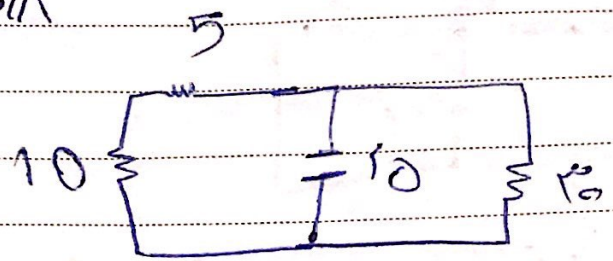
$t > ۰/۸$



$V_C(۰/۸) = ۳/۲۷\, e^{-۲۶۶۶/۶\,(۸۰۰-۲۰۰)\times ۱۰^{-۳}} \simeq ۰/۶۸\,V$

$V_C = ۰/۶۸\, e^{-4000(t-۰/۸\times ۱۰^{-3})}$

$\boxed{V_C(1ms) \simeq ۰/۲۰۴\,V}$

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