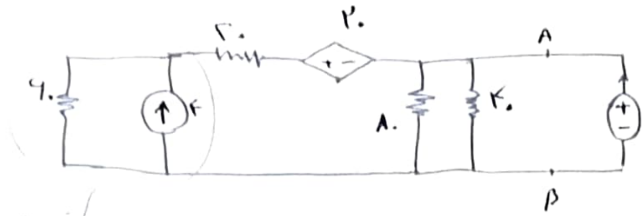
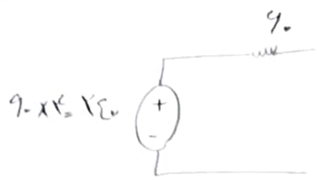
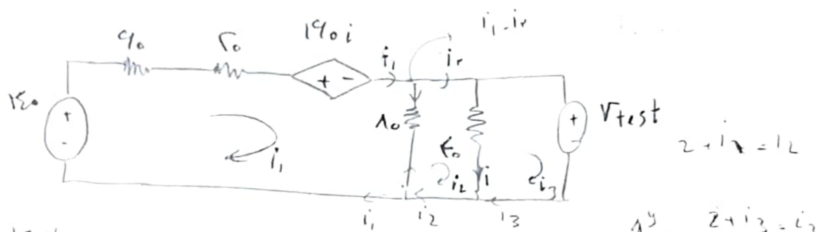
شهرزاد [illegible] ، ۸۱۰۱۰۰۲۷۲

①







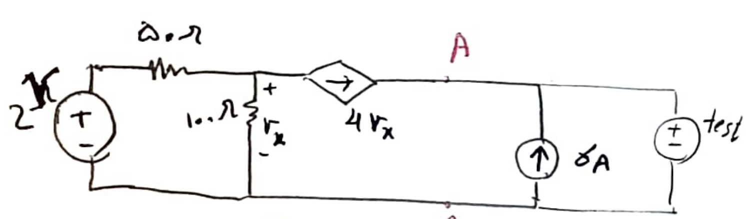
① KVL مش: $-140 + 80i + 190i + 80(i_1 - i_2) = 0$

② KVL مش: $40(i_2 - i_3) + 80(i_2 - i_1) = 0$ → حل معادلات → $-i_3 = +i_{test} = -556000$

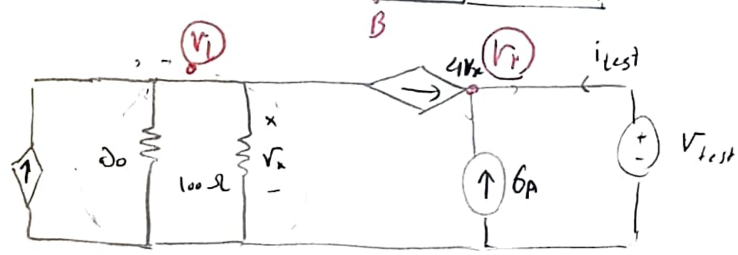
③ KVL مش: $V_{test} + 40(i_3 - i_2) = 0$

$V_{test} = (10)\, i_{test} + (30)$ → $R_{th} = 10\,\Omega$, $V_{th} = 30\,\Omega$

② [illegible]



$\frac{2}{50} = 0.04$



$R_T = \frac{100 \times 50}{150} = 100/3$

بدون تحلیل گره

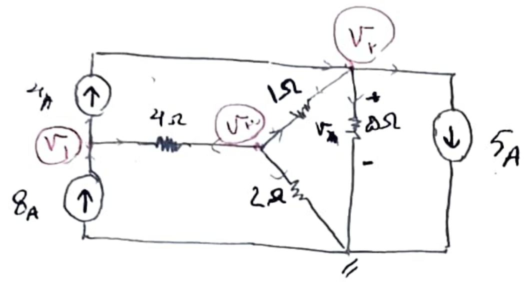
V_1 در KCL → $-0/02 + \frac{V_1}{100/3} + 4V_x = 0$ → $V_1 = 0/0099$

V_2 در KCL → $-4V_x - 4 - i_{test} = 0$ → $i_{test} = -4/039$

$V_x = V_1 = 0/0099$

سؤال ۳ (ولتاژ ۲):

الف - تحلیل گره:



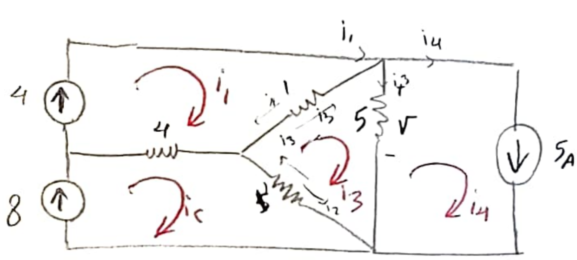
V_1 در KCL → $-8 + 4 + \frac{V_1 - V_3}{4} = 0$

V_2 در KCL → $-4 + \frac{V_2 - V_3}{1} + \frac{V_2 - 0}{5} + 5 = 0$

V_3 در KCL → $\frac{V_3 - V_2}{1} + \frac{V_3 - V_1}{4} + \frac{V_3 - 0}{2} = 0$

با متلب → $V = V_2 = 3/125$ ولت

ب - تحلیل مش:

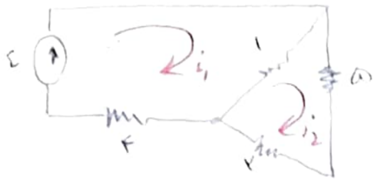


$i_1 = 4A$
$i_2 = 8A$
$i_4 = 5A$

در مش ولتاژ KVL → $(1)(i_3 - i_1) + 5(i_3 - i_4) + 2(i_3 - i_2) = 0$

$8i_3 = 4 + 25 + 16 \rightarrow i_3 = 45/8 = 3/125$

ج - جمع آثار: هر بار یکی از منابع را نگه داریم
از منابع دیگر صرف نظر کنیم
(منابع مستقل)



$i_1 = 4\,A$

KVL: $1(i_2 - i_1) + 5 i_2 + 2 i_2 = 0$

$8 i_2 = 4 \rightarrow \boxed{i_2 = 0.5}$

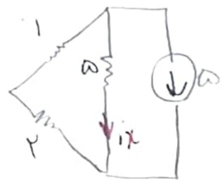
$\boxed{V = (5)\, i_2 = 5 \times 0.5 = 2.5}$ (I)

$i_1 = 8\,A$

KVL: $1 i_2 + 5 i_2 + 2(i_2 - i_1) = 0$

$\boxed{i_2 = 2\,A}$

$\boxed{V_2 = 5 i_2 = 10\ (V)}$ (II)



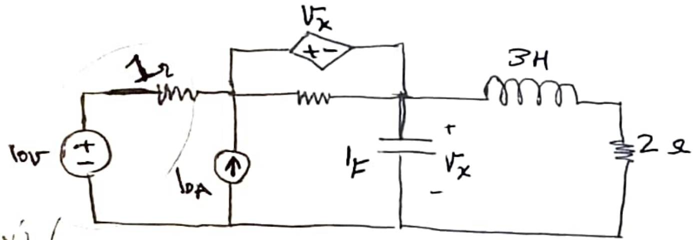
$i_x = \frac{3}{3+5} \times (-5) = -15/8$

$\boxed{V = 5 \cdot i_x = 5 \times -15/8 = -75/8\ (V)}$ (III)

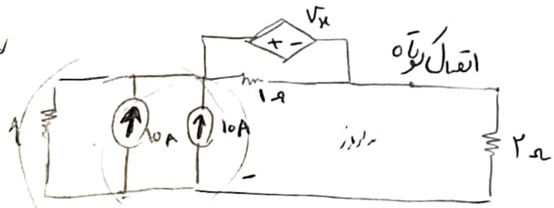
(III), (II), (I) جمع $\longrightarrow$ $\boxed{10 + 2.5 + -75/8 = 3.125}$

(4)

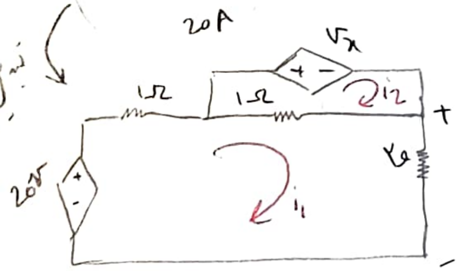
در حالت ماندگار داریم:
- خازن ← مدار باز
- سلف ← اتصال کوتاه.



تبدیل منبع



تبدیل منبع



تحلیل مش

KVL①: $-20 + (1) i_1 + (1)(i_1 - i_2) + 2 i_1 = 0$

KVL②: $V_x + 1(i_2 - i_1) = 0$

ساده کردن $\rightarrow$ $4 i_1 - i_2 = 20$, $i_1 + i_2 = 0$ $\Rightarrow$ $\boxed{i_1 = 4}$, $V_x = 8$, $i_1 = 4$

ولتاژ خازن — جریان سلف