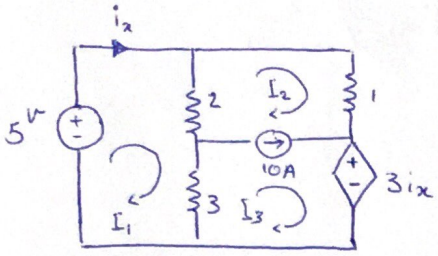
یا لطیف

پاسخ کوییز اول مدار ۱

#1



KVL in I_1 : $-5 + 2(I_1 - I_2) + 3(I_1 - I_3) = 0$

$\Rightarrow \boxed{5I_1 - 2I_2 - 3I_3 = 5}$ (I)

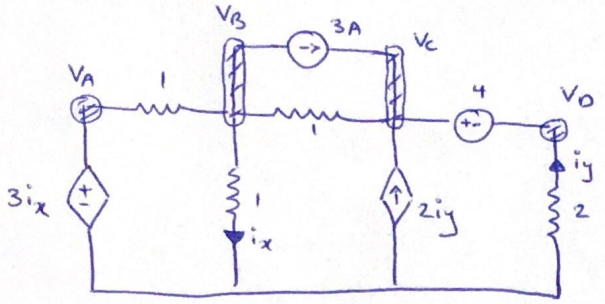
KVL in I_2, I_3 : $1 \times I_2 + 3i_x + 3(I_3 - I_1) + 2(I_2 - I_1) = 0$

$i_x = I_1 \longrightarrow \boxed{3I_2 - 2I_1 + 3I_3 = 0}$ (II)

از طرفی داریم : $\boxed{I_3 - I_2 = 10}$ (III)

$$\longrightarrow \begin{cases} 5I_1 - 2I_2 - 3I_3 = 5 \\ -2I_1 + 3I_2 + 3I_3 = 0 \\ I_3 - I_2 = 10 \end{cases} \Rightarrow \begin{cases} I_1 = 3\ A \\ I_2 = -4\ A \\ I_3 = 6\ A \end{cases}$$

#2



$$\begin{cases} V_A = 3i_x = 3V_B & (I) \\ V_C - V_D = 4 & (II) \end{cases}$$

KCL in V_B : $\frac{V_B - 0}{1} + \frac{V_B - V_A}{1} + \frac{V_B - V_C}{1} + 3 = 0 \xrightarrow{V_A = 3V_B} V_C = 3\ V$

(II) : $V_D = V_C - 4 = 3 - 4 = -1\ V$

KCL in V_C ; V_D : $-3 - 2i_y + \frac{V_C - V_B}{1} + \frac{V_D - 0}{2} = 0 \xrightarrow[i_y = -\frac{V_D}{2}]{V_C = 3} \frac{3}{2} V_D = V_B \Rightarrow V_B = -\frac{3}{2}$

$\xrightarrow{(I)} V_A = 3\left(\frac{-3}{2}\right) = \frac{-9}{2}$