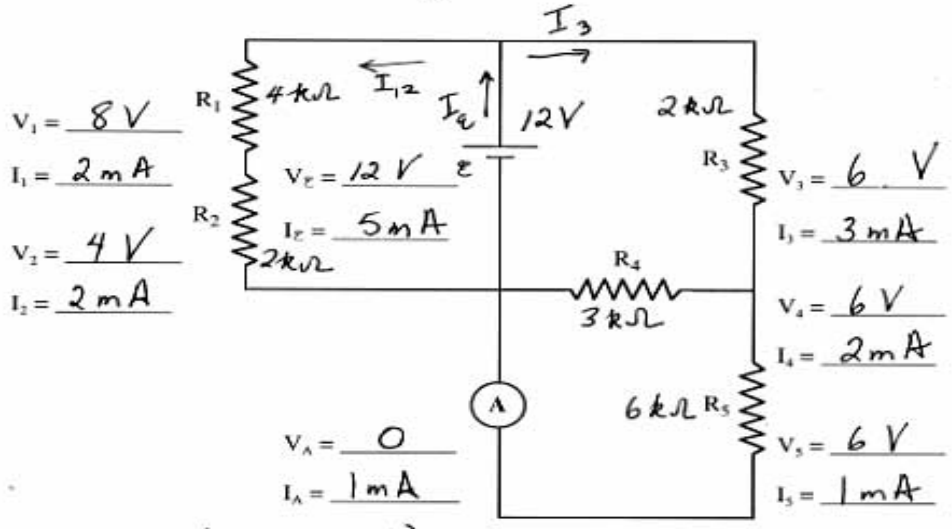
Answers:

$I_\mathcal{E} = I_{12} + I_3 = 2mA + 3mA = 5mA$



(1) R_1 & R_2 in series (same current)

$R_{12} = R_1 + R_2 = 6\,k\Omega$

$I_1 = I_2 = I_{12} = \frac{V_{12}}{R_{12}} = \frac{12\,V}{6\,k\Omega} = 2mA$

$V_1 = I_1 R_1 = 2mA\,(4k\Omega) = 8V$

$V_1 + V_2 = \mathcal{E} \rightarrow V_2 = 12 - 8V = 4V$

(2) ideal ammeter has $R_A = 0$

so $V_A = I_A R_A = 0$

and $I_A = I_5 =$

(3) $R_4 \,//\, R_5$

$\rightarrow R_{45} = \frac{1}{\frac{1}{R_4} + \frac{1}{R_5}} = \frac{1}{\frac{1}{3} + \frac{1}{6}}$

$= \frac{1}{1/2} = 2\,k\Omega$

R_{45} series w/ R_3

$R_{345} = R_3 + R_{45} = 2k\Omega + 2k\Omega$

$= 4\,k\Omega$

$I_3 = I_{45} = I_{345} = \frac{V_{345}}{R_{345}}$

$= \frac{12\,V}{4\,k\Omega} = 3\,mA$

$V_3 = I_3 R_3 = 3mA\,(2k\Omega) = 6V$

$V_4 = V_5 = V_{45} = \mathcal{E} - V_3 = 12 - 6 = 6V$

$I_4 = \frac{V_4}{R_4} = \frac{6V}{3k\Omega} = 2mA$

$I_5 = I_3 - I_4 = 3 - 2mA = 1mA$

(4)

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