Chapter 6

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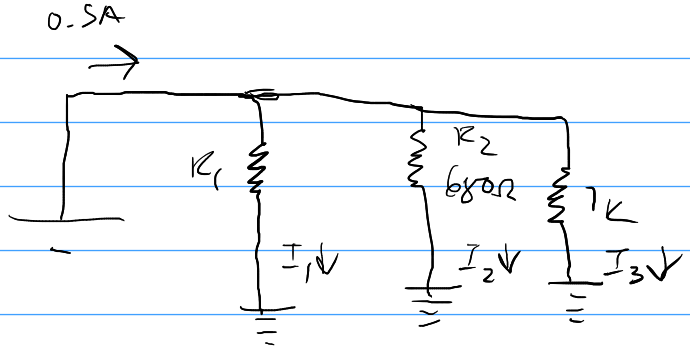
b)



$500\,mA = I_1 + I_2 + 100\,mA$

$I_2 = \frac{100}{680}$ $\qquad I = I_1 + I_2 + I_3$

$I_3 = \frac{100}{1K} = 100\,mA$

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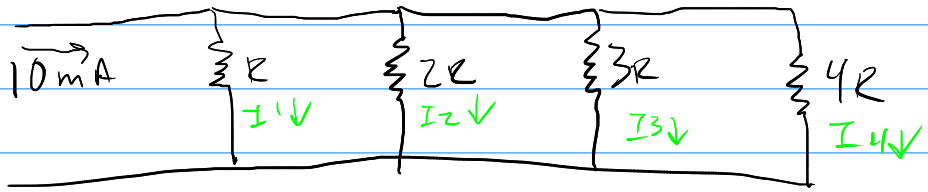


$10mA = I_1 + I_2 + I_3 + I_4$

$I_1 = \frac{\epsilon}{R}$ $\qquad I_2 = \frac{\epsilon}{2R}$ $\qquad I_3 = \frac{\epsilon}{3R}$ $\qquad I_4 = \frac{\epsilon}{4R}$

$I_3 = \frac{\epsilon}{3R} = \frac{1}{3}\frac{\epsilon}{R} = \frac{1}{3} I_1$ $\qquad I_4 = \frac{1}{4} I_1$

$10mA = I_1 + \frac{1}{2} I_1 + \frac{1}{3} I_1 + \frac{1}{4} I_1$

$= I_1 \left(1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}\right)$

$R_i \perp R$

$I_1 = \frac{R_T}{R} 10mA$

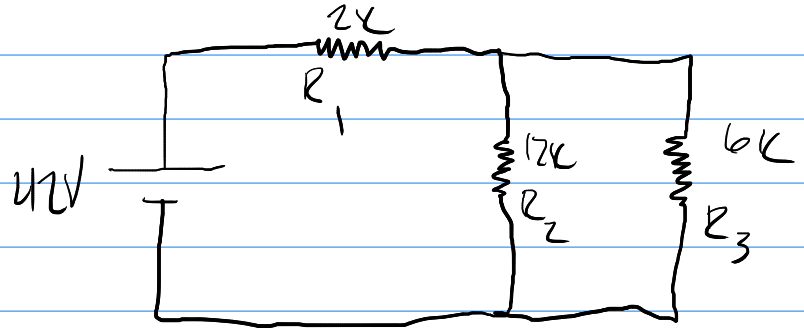
Chapter 7

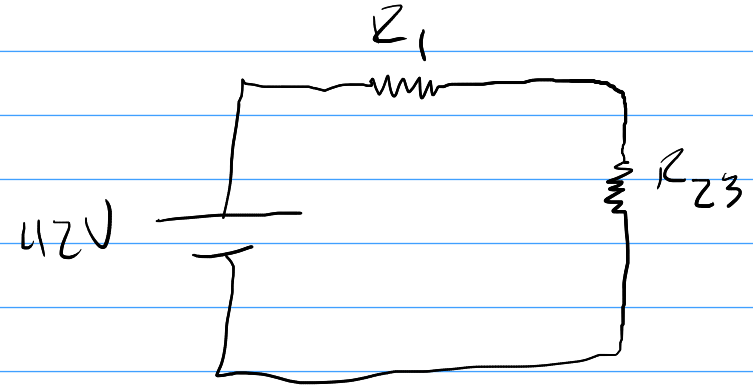
Series Parallel Circuits

Circuits that contain both series of Parallel circuit configuration.

The analysis of series-Parallel DC network with single source usually requires that resistance "seen" by the source (R_T) be determined by combining series of parallel elements until a single equivalent resistance vs rains.

Example: Find all currents





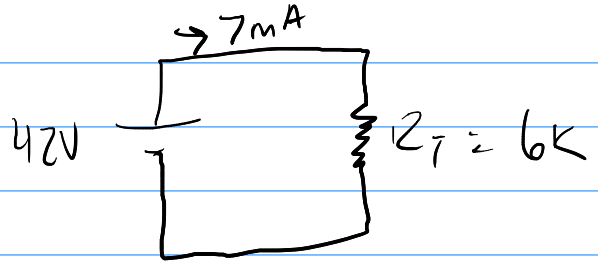
$R_T = 2K + 4K = 6K$

$$R_{23} = \frac{R_2 R_3}{R_2 + R_3}$$

$$\frac{(12K)(6K)}{12K + 6K}$$

$$= 4K$$

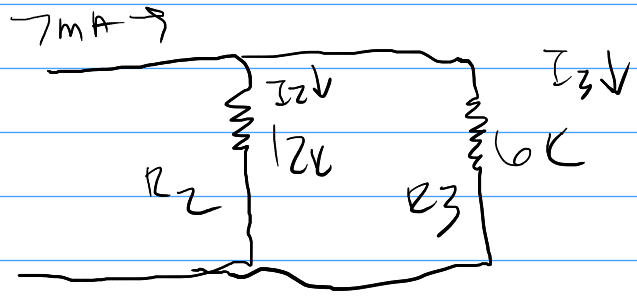
$$I = \frac{42V}{6K} = 7mA$$



$$V_{R_1} = I \cdot R_1 = (7mA)(2K) = 14V$$

$$V_{R_{23}} = I \cdot R_{23} = (7mA)(4K) = 42V - 14V = 28V$$

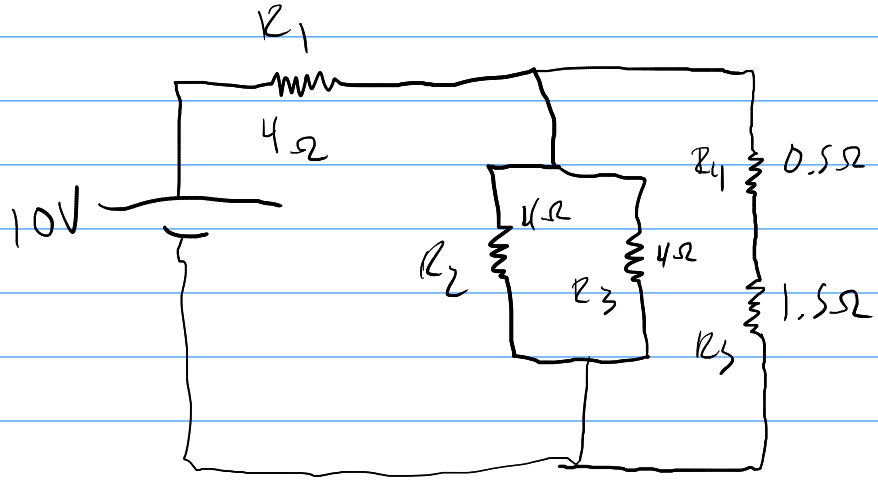
$$I_2 = \frac{28V}{12K} \qquad I_3 = \frac{28V}{6K}$$

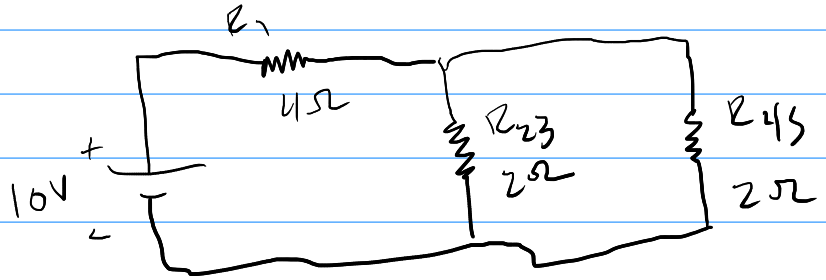


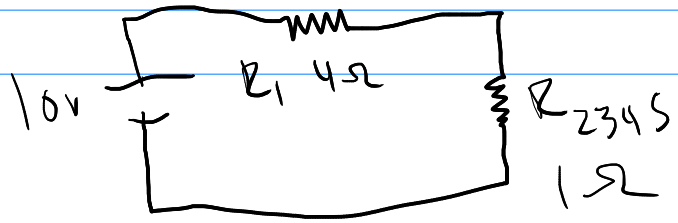
$$I_2 = \frac{6K}{6K+12K}(7mA)$$

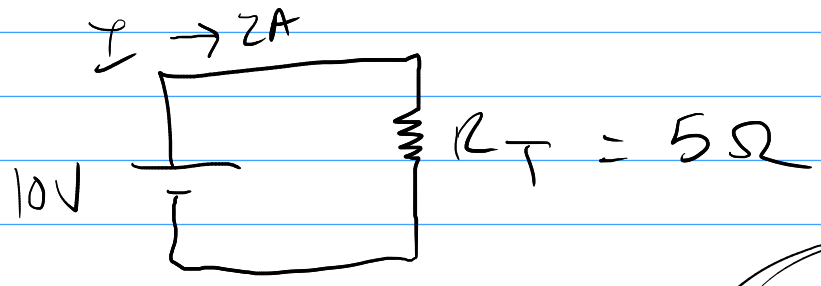
$$I_3 = \frac{12K}{6K+12K}(7mA)$$

$$I_3 = I - I_2$$

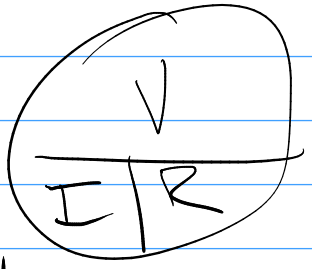








$$I_A = \frac{10V}{5\Omega} = 2A$$



$$V_{R1} = I_A R_1 = (2A)(4\Omega) = 8V$$

$$V_{R2345} = 10 - 8 = 2V \quad \text{KVL}$$

$$= (1\Omega)(2A) = 2V \quad \text{ohm's law}$$

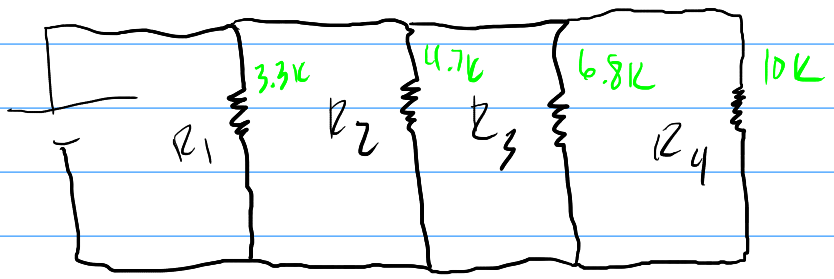
$$I_B = \frac{2V}{2} = 1A$$

$$I_C = \frac{2V}{2} = 1A$$

LAB 9

Parallel circuit

$$R_T = \frac{1}{\frac{1}{3.3K} + \frac{1}{4.7K} + \frac{1}{6.8K} + \frac{1}{10K}} \quad 12V$$



$$R_{12} = \frac{R_1 R_2}{R_1 + R_2}$$

$$R_{123} = \frac{R_{12} \cdot R_3}{R_{12} + R_3}$$

$$R_{1234} = \frac{R_{123} R_4}{R_{123} + R_4}$$

$$I_T = \frac{12}{R_T}$$

$$I_1 = \frac{12}{3.3K} \qquad I_T = I_1 + I_2 + I_3 + I_4$$

$$I_2 = \frac{12}{4.7K}$$

$$I_3 = \frac{12}{6.8K}$$

$$I_4 = \frac{12}{10K}$$