

Prueba electrotecnica

2º L

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(4)

$$R_2 = 16 \Omega$$

$$R_1 = 4 \Omega$$

$$R_3 = 10 \Omega$$

$$R_4 = 20 \Omega$$

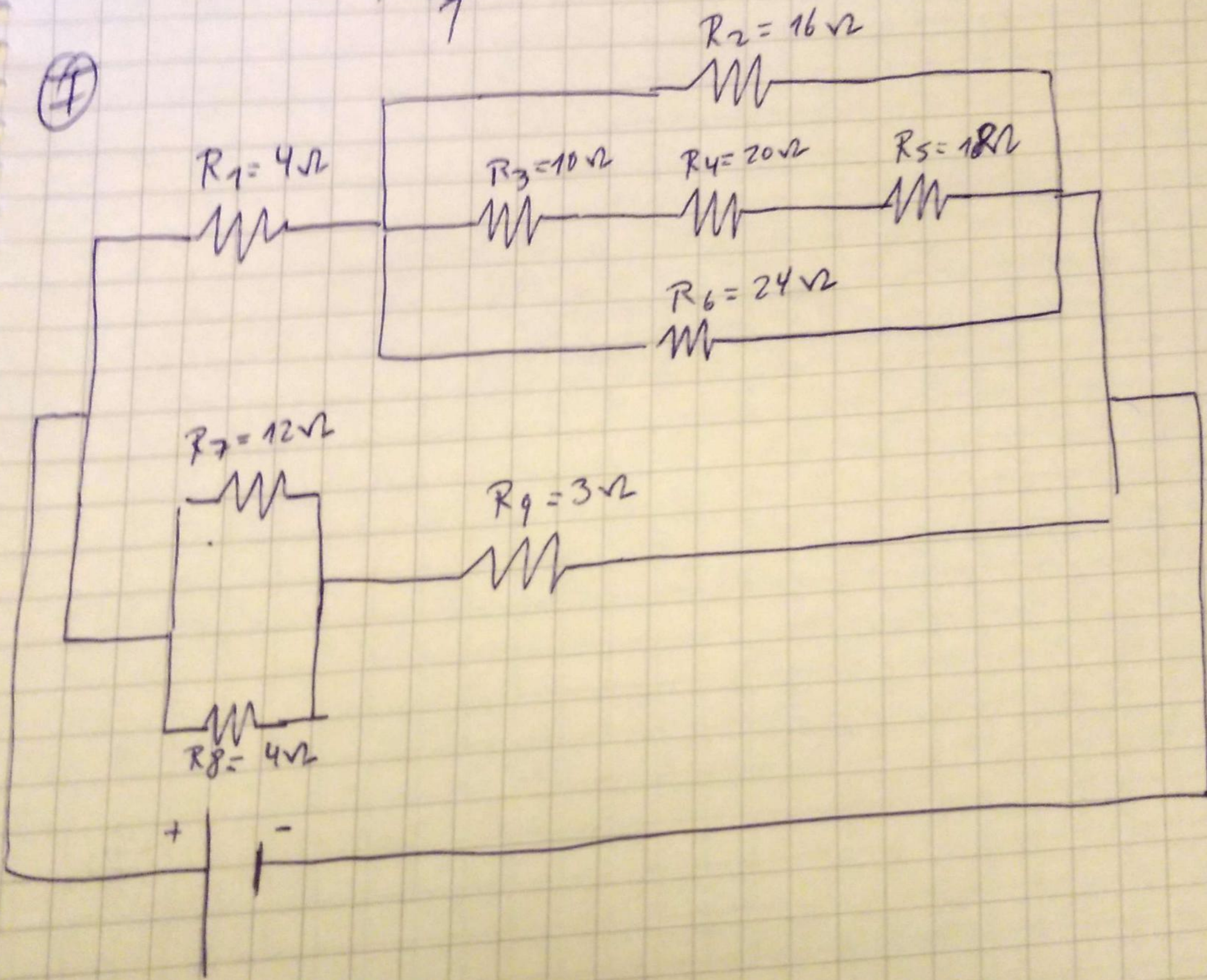
$$R_5 = 18 \Omega$$

$$R_6 = 24 \Omega$$

$$R_7 = 12 \Omega$$

$$R_9 = 3 \Omega$$

$$R_8 = 4 \Omega$$



②

1) $R_3 + R_4 + R_5 = 10 + 20 + 18 = \boxed{48 \Omega} R_A$

2) $R_2 \parallel R_A + R_6 = \frac{1}{\frac{1}{16} + \frac{1}{48} + \frac{1}{24}} = \boxed{8 \Omega} R_B$

3) $R_1 + R_B = 4 + 8 = \boxed{12 \Omega} R_C$

4) $R_7 \parallel R_8 = \frac{1}{\frac{1}{12} + \frac{1}{4}} = \boxed{3 \Omega} R_D$

5) $R_9 + R_D = 3 + 3 = \boxed{6 \Omega} R_E$

6) $R_C \parallel R_E = \frac{1}{\frac{1}{12} + \frac{1}{6}} = \boxed{4 \Omega}$

$\boxed{R_T = 4 \Omega}$

(4)

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(II)

$$R_3 + R_4 = 1000 + 800 = 1800 \Omega \quad R_A$$

$$R_A \parallel R_5 = \frac{1}{\frac{1}{1800} + \frac{1}{500}} = 353,84 \Omega \quad R_B$$

$$R_B + R_6 + R_7 = 353,84 + 1000 + 2000 = 3353,84 \Omega \quad R_C$$

$$R_C \parallel R_8 = \frac{1}{\frac{1}{3353,84} + \frac{1}{1000}} = 780,40 \Omega \quad R_D$$

$$R_D + R_9 + R_{10} = 780,40 + 1000 + 700 = 2480,4 \Omega \quad R_E$$

$$R_E \parallel R_{11} = \frac{1}{\frac{1}{2480,4} + \frac{1}{500}} = 404,90 \Omega \quad R_F$$

$$R_F + R_{12} = 404,90 + 500 = 904,90 \Omega \quad R_G$$

$$A) R_T = 904,90 \Omega \quad I_T = \frac{10V}{904,90 \Omega} = 0,011 A$$

$$B) V_{R_8} = I_T \cdot R_8 = 0,011 A \cdot 1000 \Omega = 11 V$$

$$C) V_{R_4} = I_T \cdot R_4 = 0,011 A \cdot 800 \Omega = 8,8 V$$

$$d) I_{R_3} = I_T = 0,011 A$$

(4)

$$\bullet R_2: [R = 500\Omega] \quad [I = 0,036\text{ A}]$$

$$V = 0,036 \cdot 500$$

$$V = 18\text{ volt}$$

$$\bullet R_{10}: [R = 800\Omega] \quad I = \frac{22}{800}$$

$$[I = 0,027\text{ A}]$$

$$V = 40 - 18,$$

$$[V = 22\text{ volt}]$$

$$\star R_1 + R_8 + R_9 = [V = 22]$$

$$[R = 2700]$$

$$I_T = \frac{22}{2700} = [0,00814\text{ A}]$$

$$\bullet R_1: [R = 1000\Omega] \quad [I = 0,00814\text{ A}]$$

$$V = 0,00814 \cdot 1000$$

$$[V = 8,14\text{ volt}]$$

$$\bullet R_9: [R = 700\Omega] \quad [I = 0,00814\text{ A}]$$

$$[V = 5,69\text{ volt}]$$

$$\star R_2 + R_9 + R_8 + R_1 = [40\text{ V}]$$

$$18 + 5,69 + R_8 + 8,14 = 40\text{ V} \Rightarrow [R_8 = 8,17\text{ volt}]$$

$$\bullet R_8: [R = 1000\Omega] \quad I = \frac{8,17}{1000}$$

$$[V = 8,17\text{ volt}]$$

$$[I = 0,00817\text{ A}]$$

$$\star R_6 + R_5 + R_7 = V = 8,17\text{ volt}$$

$$[R_T = 3800] \quad I = \frac{8,17}{3800} = [0,00215\text{ A}]$$

$$V = 0,00215 \cdot 1000$$

$$\bullet R_6: [R = 1000\Omega] \quad [I = 0,00215\text{ A}] \quad [V = 2,15\text{ volt}]$$

$$\bullet R_7: [R = 2000\Omega] \quad [I = 0,00215\text{ A}] \quad [V = 4,3\text{ volt}]$$

$$\star R_2 + R_9 + R_7 + R_5 + R_6 + R_1 = 40\text{ V}$$

$$18 + 5,69 + 4,3 + R_5 + 2,15 + 8,14 = 40 \Rightarrow [R_5 = 40 - 38,18]$$

$$[R_5 = 1,72\text{ V}]$$

④

$$\cdot R_5: R = 800 \Omega \quad I = \frac{1,72}{800} \quad [V = 1,72 \text{ volt}]$$

$$[I = 0,00215 \text{ A}]$$

$$\star R_3 + R_4 = [V = 1,72]$$

$$[R_7 = 1800 \Omega] \quad I = \frac{1,72}{1800} = [0,000955 \text{ A}]$$

$$\cdot R_3: R = 1000 \Omega \quad [I = 0,000955 \text{ A}] \quad [V = 0,955 \text{ volt}]$$

$$\cdot R_4: R = 800 \Omega \quad [I = 0,000955 \text{ A}] \quad [V = 0,764 \text{ volt}]$$

Verification

$$V_7 = V_2 + V_{10} = 18 + 22 = [40 \text{ V}]$$

$$V_2 + V_9 + V_7 + V_4 + V_3 + V_6 + V_1 = 40 \text{ V}$$

$$18 + 5,69 + 4,3 + 0,764 + 0,955 + 2,15 + 8,14 = [39,99]$$

$$I_7 = I_{10} + I_8 + I_5 + I_3 =$$

$$0,027 + 0,00817 + 0,00215 + 0,000955 = [0,038]$$

③

⑤

$$R_9 + R_1 + R_4 = 1000 + 800 + 1000 = (2800 \Omega) R_A$$

$$R_A \parallel R_5 = \frac{1}{\frac{1}{2800} + \frac{1}{4000}} = (1647,05 \Omega) R_B$$

$$R_B + R_6 + R_8 = 1647,05 + 1000 + 1000 = (3647,05 \Omega) R_C$$

$$R_C \parallel R_2 = \frac{1}{\frac{1}{3647,05} + \frac{1}{1000}} = (784,80 \Omega) R_D$$

$$R_D + R_3 + R_7 = 784,80 + 800 + 1000 = (2584,80 \Omega)$$

$$A) R_T = (2584,81 \Omega) \quad I_T = \frac{40}{2584,80} = (0,0155 A)$$

$$B) V_3 = (12,4 \text{ volt})$$

$$C) V_1 = (2,304 \text{ volt})$$

$$d) I_5 = (0,00202 A)$$

$$R_3 = R = 800 \Omega \quad I = 0,0155 A$$

$$V = 0,0155 \cdot 800$$

$$V = 12,4 \text{ volt}$$

$$R_7: R = 1000 \Omega \quad I = 0,0155 A$$

$$V = 0,0155 \cdot 1000$$

$$V = 15,5 \text{ volt}$$

$$\star R_7 + R_2 + R_3 = 40 V$$

$$R_2 = 12,1 V$$

$$R_2: R = 1000 \Omega \quad I = \frac{12,1}{1000}$$

$$I = 0,0121 A$$

$$V = 12,1 \text{ volt}$$

$$\star R_6 + R_8 + R_5 = V = 12,1$$

$$R = 6000 \Omega$$

$$I = \frac{12,1}{6000} = 0,00201 A$$

$$V = 0,00201 \cdot 1000$$

$$R_6: R = 1000 \Omega \quad I = 0,00201 A \quad V = 2,01 \text{ volt}$$

$$R_8: R = 1000 \Omega \quad I = 0,00201 A \quad V = 2,01 \text{ volt}$$

$$\star R_2 + R_8 + R_5 + R_6 + R_3 = 40 V$$

$$15,5 + 2,01 + R_5 + 2,01 + 12,4 = 40 V$$

$$R_5 = 8,08 V$$

$$R_5: R = 4000 \Omega \quad I = \frac{8,08}{4000}$$

$$V = 8,08 \text{ volt}$$

$$I = 0,00202 A$$

$$\star R_9 + R_1 + R_4 = 8,08 \text{ k}\Omega$$

$$R = 2800$$

$$I = \frac{5,08}{2800} = 0,00288 \text{ A}$$

$$\bullet R_9: R = 1000 \Omega$$

$$I = 0,00288 \text{ A}$$

$$V = 0,00288 \cdot 1000$$

$$V = 2,88 \text{ volt}$$

$$\bullet R_1: R = 500 \Omega$$

$$I = 0,00288 \text{ A}$$

$$V = 0,00288 \cdot 500$$

$$V = 1,44 \text{ volt}$$

$$\bullet R_4: R = 1000 \Omega$$

$$I = 0,00288 \text{ A}$$

$$V = 0,00288 \cdot 1000$$

$$V = 2,88 \text{ volt}$$

Verhalen

$$V_7 = V_2 + V_3 = 15,5 + 12,4 = 27,9$$

$$V_2 + V_8 + V_4 + V_1 + V_9 + V_6 + V_3 =$$

$$15,5 + 2,01 + 2,88 + 2,304 + 2,88 + 2,01 + 12,4 = 39,984$$

$$I_7 = I_2 + I_5 + I_1 = 0,0121 + 0,00202 + 0,00288$$

$$= 0,017 \text{ A}$$