

2-14.

$$U = 4V$$

$$I = ?$$

$$I = I_1 + I_2 = I_1 U + \sqrt{\frac{U}{R_2}} = 6A$$

2-15.

$$I = k U^2$$

$$k = 0.1 \text{ mA/V}^2 = 1 \cdot 10^{-4} \text{ A/V}^2$$

$$R = 2000 \Omega$$

$$U = 2.5V$$

$$I = ?$$

$$P = ?$$

$$I_1 = k U^2 = 6.25 \cdot 10^{-4} A$$

$$I_2 = \frac{U}{R} = 1.25 \cdot 10^{-3} A$$

$$I = I_1 + I_2 = 1.875 \cdot 10^{-3} A$$

$$P = UI = 4.6875 \cdot 10^{-3} W$$

2-16.

$$U = k I^{0.5} = 2 \sqrt{I}$$

$$k = 1 \text{ V/A}^{0.5}$$

$$R = 1 \Omega$$

$$I = 2A$$

$$U = ?$$

$$U_1 = k \sqrt{I} = 1.41V$$

$$U_2 = IR = 2A$$

$$U = U_1 + U_2 = 3.41V$$

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11.1

1-1.

$$R_1 = 10 \Omega$$

$$I_1 = 1A$$

$$R_2 = 2.5 \Omega$$

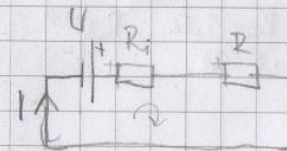
$$I_2 = 2A$$

$$a) I_{KS} = ?$$

$$b) U_{PH} = ?$$

$$c) R_i = ?$$

$$d) P = ? R = 2.5, 5, 10 \Omega$$



$$U = I R_i + I_1 R_1$$

$$U = I_2 R_i + I_2 R_2$$

$$I_1 R_i - I_2 R_i = I_2 R_2 - I_1 R_1$$

$$R_i = \frac{I_2 R_2 - I_1 R_1}{I_1 - I_2} = 5 \Omega$$

$$U = I_1 R_i + I_1 R_1$$

$$U = 15V = U_{PH}$$

$$I_{KS} = \frac{U}{R_i} = 3A$$

$$d) I_1 = \frac{U}{R_i + R} = 2A \quad P_1 = I^2 R = 10W$$

$$I_2 = 1.5A$$

$$P_2 = 11.25W$$

$$I_3 = 1A$$

$$P_3 = 10W$$

1-3.

$$I_A = 2A$$

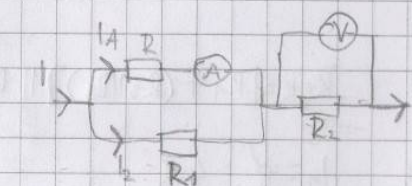
$$U = 18V$$

$$a) R = ?$$

$$b) I = ?$$

$$c) P = ?$$

$$R_1 = R_2 = 3 \Omega$$



$$I = \frac{U}{R_i} = 6A$$

$$R_{OK} = (R \parallel R_1) + R_2 = 5 \Omega$$

$$P = I^2 R_{OK} = 180W$$

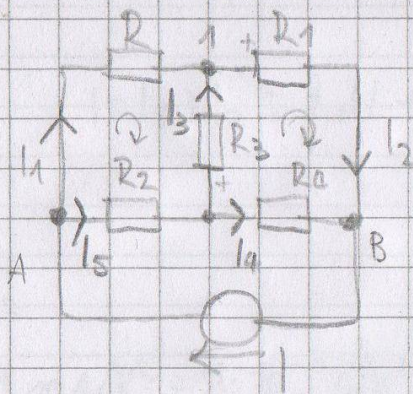
$$I = I_1 + I_2$$

$$I_2 = 4A$$

$$U_{R1} = U_R = I_2 R_1 = 12V$$

$$R = \frac{U_R}{I_A} = 6 \Omega$$

1-5.
 $R = ?$
 $I = ?$
 $U = ?$



$$R_1 = 2\Omega \quad R_2 = 1\Omega \quad R_3 = 1\Omega \quad R_4 = 7\Omega$$

$$I_1 = 2A \quad I_2 = 10A$$

$$I_2 = I_1 + I_3$$

$$I_3 = 8A$$

$$I_4 R_4 = I_3 R_3 + I_2 R_1$$

$$I_4 = \frac{I_3 R_3 + I_2 R_1}{R_4} = 4A$$

$$I = I_2 + I_4 = 14A$$

$$I = I_1 + I_5$$

$$I_5 = 12A$$

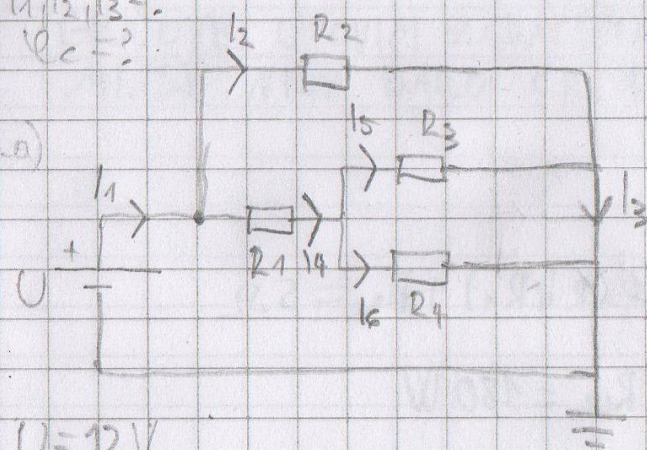
$$I_1 R = I_3 R_3 + I_5 R_2$$

$$R = \frac{I_3 R_3 + I_5 R_2}{I_1} = 10\Omega$$

$$U_{AB} = I_4 R_4 + I_5 R_2 = 40V$$

1-6.

$I_1, I_2, I_3 = ?$
 $U_c = ?$



$$R_{0K} = [R_1 + (R_3 \parallel R_4)] \parallel R_2 = 3\Omega$$

$$I_1 = \frac{U}{R_{0K}} = 4A$$

$$I_1 = I_2 + I_4$$

$$I_4 = 2A$$

$$I_5 = I_6 = I_4 \cdot \frac{1}{2} = 1A$$

$$I_3 = I_2 + I_5 = 3A$$

$$U = 12V$$

$$R_1 = 4\Omega$$

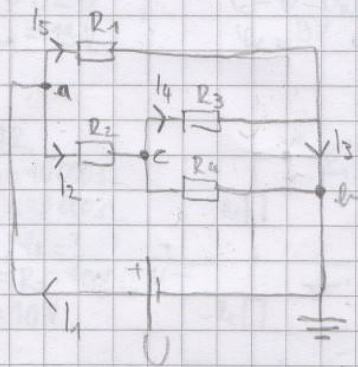
$$R_2 = 6\Omega$$

$$R_3 = 4\Omega$$

$$R_4 = 4\Omega$$

$$I_2 = \frac{U}{R_2} = 2A$$

6-)



$$\begin{aligned} R_1 &= 6\Omega \\ R_2 &= 3\Omega \\ R_3 &= 6\Omega \\ R_4 &= 6\Omega \\ U &= 12V \end{aligned}$$

$$R_{\text{eq}} = [R_2 + (R_3 \parallel R_4)] \parallel R_1 = 3\Omega$$

$$I_1 = \frac{U}{R_{\text{eq}}} = 4A$$

$$R_{34} = R_3 \parallel R_4 = 3\Omega$$

$$U_{R2} = U_{R34} = \frac{U}{2} = 6V$$

$$U_{R34} = U_{R3} = U_{R4}$$

$$I_4 = \frac{U_{R3}}{R_3} = 1A$$

$$I_2 = \frac{U_{R2}}{R_2} = 2A$$

$$I_3 = I_4 + I_5 = 3A$$

$$U_{R1} = U$$

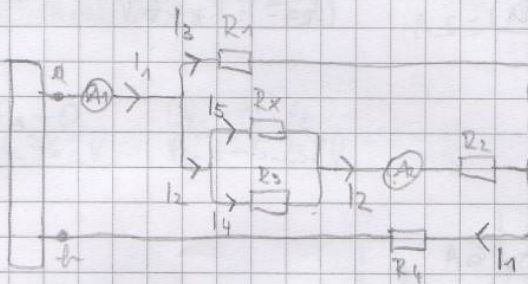
$$I_5 = \frac{U}{R_1} = 2A$$

$$\begin{aligned} U_{R3} &= U_c - 0 \\ U_c &= +6V \end{aligned}$$

1-7.

$$\begin{aligned} I_1 &= 3A \\ I_2 &= 1A \\ R_x &=? \end{aligned}$$

$$\begin{aligned} R_1 &= 10\Omega \\ R_2 &= 5\Omega \\ R_3 &= 45\Omega \\ R_4 &= 8\Omega \end{aligned}$$



$$\begin{aligned} I_1 &= I_2 + I_3 \\ I_3 &= 2A \end{aligned}$$

$$U_{R1} = I_1 R_1 = 30V$$

$$U_{R2} = I_2 R_2 = 5V$$

$$\begin{aligned} U_{R1} &= U_{R2} + U_{R3/x} \\ U_{R3/x} &= 15V \end{aligned}$$

$$I_4 = \frac{U_{R3}}{R_3} = \frac{1}{3}A$$

$$\begin{aligned} I_2 &= I_4 + I_5 \\ I_5 &= \frac{2}{3}A \end{aligned}$$

$$R_x = \frac{U_{R3/x}}{I_5} = 22.5\Omega$$

1-8.

$$R_t = 100$$

$$100 = R + \frac{(R+100)R}{R+100+R}$$

$$100 = R + \frac{R^2 + 100R}{2R + 100}$$

$$200R + 10000 = 2R^2 + 100R + R^2 + 100R$$

$$R = \sqrt{\frac{10000}{3}} = 57.74\Omega$$

1-9.

$$R = 57.735 \Omega$$

$$R_k = R + \frac{R}{2} = 86.6 \Omega$$

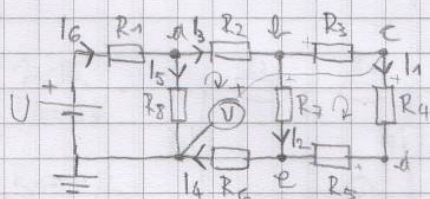
$$R_0 = R + R = 115.47 \Omega$$

$$\sqrt{R_k R_0} = 100$$

1-10.

$$U = ?$$

$$\varphi_a, \varphi_b, \varphi_c, \varphi_d, \varphi_e = ?$$



$$R_1 = 5 \Omega \quad R_2 = 1 \Omega \quad R_3 = 1 \Omega \quad R_4 = 3 \Omega \quad R_5 = 2 \Omega$$

$$R_6 = 2 \Omega \quad R_7 = 3 \Omega \quad R_8 = 5 \Omega \quad I_1 = 1 \text{ A}$$

$$U_{R4} = I_1 R_4 = 3 \text{ V} \quad U_{R5} = I_1 R_5 = 2 \text{ V} \quad U_{R3} = I_1 R_3 = 1 \text{ V}$$

$$I_2 R_7 = I_1 (R_3 + R_4 + R_5)$$

$$I_2 = \frac{I_1 (R_3 + R_4 + R_5)}{R_7} = 2 \text{ A} \quad U_{R7} = I_2 R_7 = 6 \text{ V}$$

$$I_3 = I_1 + I_2 = 3 \text{ A}$$

$$I_4 = I_1 + I_2 = 3 \text{ A}$$

$$U_{R2} = I_3 R_2 = 3 \text{ V}$$

$$U_{R6} = I_4 R_6 = 6 \text{ V}$$

$$U_{R8} = U_{R2} + U_{R7} + U_{R6} = 15 \text{ V}$$

$$I_6 = I_3 + I_5 = 6 \text{ A}$$

$$I_5 = \frac{U_{R8}}{R_8} = 3 \text{ A}$$

$$U_{R1} = I_6 R_1 = 30 \text{ V}$$

$$U = U_{R1} + U_{R8} = 45 \text{ V}$$

$$U_{R8} = \varphi_a - 0$$

$$\varphi_a = 15 \text{ V}$$

$$U_{R2} = \varphi_a - \varphi_b$$

$$\varphi_b = 12 \text{ V}$$

$$U_{R3} = \varphi_b - \varphi_c$$

$$\varphi_c = 11 \text{ V}$$

$$U_{R4} = \varphi_c - \varphi_d$$

$$\varphi_d = 8 \text{ V}$$

$$U_{R5} = \varphi_d - \varphi_e$$

$$\varphi_e = 6 \text{ V}$$

1-11.

$$I = ?$$

$$U = ?$$

$$\varphi_a, \varphi_b, \varphi_c, \varphi_d = ?$$

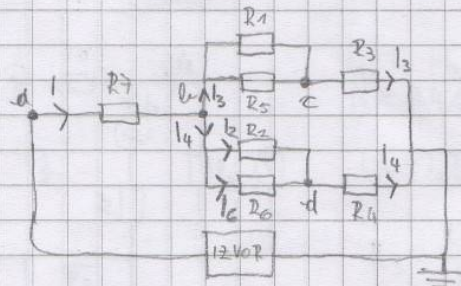
$$R_1 = 6 \Omega \quad R_2 = 10 \Omega$$

$$R_3 = 3 \Omega \quad R_4 = 10 \Omega$$

$$R_5 = 3 \Omega \quad R_6 = 10 \Omega$$

$$R_7 = 1 \Omega$$

$$I_4 = 1 \text{ A}$$



$$R_1 = R_6 \Rightarrow I_2 = I_6 = \frac{1}{2} I_4 = 0.5 \text{ A}$$

$$U_{R2} = U_{R6} = I_6 R_6 = 5 \text{ V}$$

$$U_{R4} = I_4 R_4 = 10 \text{ V}$$

$$U_{R4} = \varphi_d - 0$$

$$\varphi_d = 10 \text{ V}$$

$$U_{R2} = \varphi_b - \varphi_c$$

$$\varphi_b = 15 \text{ V}$$

$$I = I_3 + I_4 = 4 \text{ A}$$

$$U_{R7} = I R_7 = 4 \text{ V}$$

$$U = U_{R7} + \varphi_b = 19 \text{ V}$$

$$R_{135} = R_3 + (R_1 \parallel R_5) = 5.5 \Omega$$

$$\varphi_b - 0 = U_{R1} + U_{R3} = 15 \text{ V}$$

$$U_{R1} = \varphi_b \cdot \frac{R_1 \parallel R_5}{R_{135}} = 6 \text{ V} = U_{R5}$$

$$U_{R3} = 9 \text{ V} \quad I_2 = \frac{U_{R3}}{R_3} = 3 \text{ A}$$

$$\varphi_a - 0 = U$$

$$\varphi_a = 10V$$

$$\varphi_c - 0 = U_{R3}$$

$$\varphi_c = 9V$$

1-12.

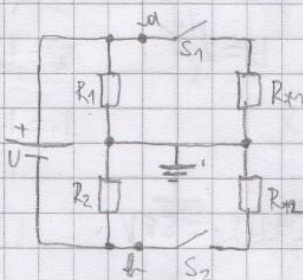
$$R_{x1} = 10000\Omega$$

$$R_{x2} = 20000\Omega$$

$$\varphi_a, \varphi_b = ?$$

$$R_1 = R_2 = 1000\Omega$$

$$U = 10V$$



a) OTVORENE SKLOPKE

$$U_{R1} = U_{R2} = \frac{U}{2} = 5V$$

$$U_{R1} = \varphi_a - 0$$

$$\varphi_a = 5V$$

$$U_{R2} = 0 - \varphi_b$$

$$\varphi_b = -5V$$

b) S1 ZATVORENA, S2 OTVORENA

$$U_{11} = U \frac{R_1 \parallel R_{x1}}{(R_1 \parallel R_{x1}) + R_2} = 4.762V$$

$$U_{R2} = U \frac{R_2}{(R_1 \parallel R_{x1}) + R_2} = 5.238V$$

$$U_{11} = \varphi_a - 0$$

$$\varphi_a = 4.762V$$

$$U_{R2} = 0 - \varphi_b$$

$$\varphi_b = -5.238V$$

c) ZATVORENE SKLOPKE

$$U_{11} = U \frac{R_1 \parallel R_{x1}}{(R_1 \parallel R_{x1}) + (R_2 \parallel R_{x2})} = 4.884V$$

$$U_{12} = U \frac{R_2 \parallel R_{x2}}{(R_1 \parallel R_{x1}) + (R_2 \parallel R_{x2})} = 5.116V$$

$$U_{11} = \varphi_a - 0$$

$$\varphi_a = 4.884V$$

$$U_{12} = 0 - \varphi_b$$

$$\varphi_b = -5.116V$$

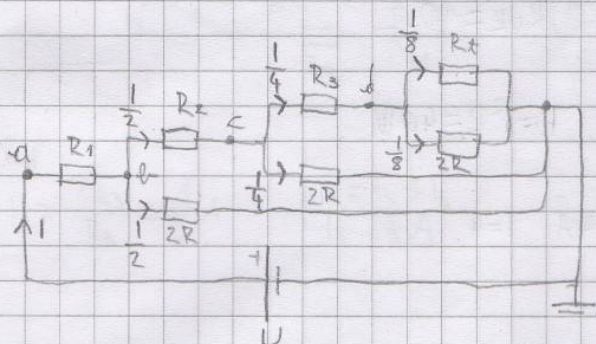
1-13.

a) $R_{VK} = ?$

b) $\varphi_a = ?$

$$\varphi_d = 1V$$

$$R_1 = R_2 = R_3 = R$$



$$R_{VK} = R_1 + 2R \parallel (R_2 + 2R \parallel (R_3 + R_4 \parallel 2R))$$

$$= R_1 + 2R \parallel (R_2 + 2R \parallel (R_3 + R))$$

$$= R_1 + 2R \parallel (R_2 + R)$$

$$= R_1 + R = 2R$$

$$U_{R4} = \varphi_d - 0 = 1V$$

$$\frac{1}{8} = \frac{U_{R4}}{R_4}$$

$$U_{R1} = 1R_1 = \frac{4}{R} \cdot R = 4V$$

$$U_{R2} = \frac{1}{2}R_2 = \frac{2}{R} \cdot R = 2V$$

$$1 = \frac{8}{2R} = \frac{4}{R}$$

$$U_{R3} = \frac{1}{4}R_3 = \frac{1}{R} \cdot R = 1V$$

$$\varphi_a = U_{R1} + U_{R2} + U_{R3} + U_{R4} = 8V$$

1-14.

$U_V = 16V$

$U = ?$

$R_1 = 3\Omega$

$R_2 = 3\Omega$

$R_3 = 1\Omega$

$R_4 = 10\Omega$

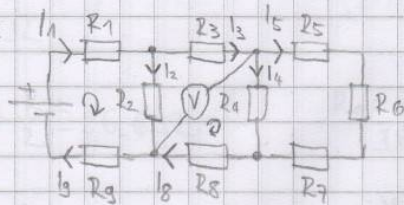
$R_5 = 6\Omega$

$R_6 = 3\Omega$

$R_7 = 1\Omega$

$R_8 = 3\Omega$

$R_9 = 7\Omega$



$R_5 + R_6 + R_7 = R_4 \Rightarrow I_4 = I_5 = 1A$

$I_2 R_2 = I_3 R_3 + I_4 R_4 + I_5 R_5$

$I_2 R_2 = 18V$

$I_2 = 2A$

$I_3 = I_2 + I_5 = 4A$

$I_1 = I_2 + I_3 = 4A$

$R_{45678} = R_8 + R_4 \parallel (R_5 + R_6 + R_7) = 8\Omega$

$I_3 = I_8 = \frac{U_V}{R_{45678}} = 2A$

$U = I_1 R_1 + I_2 R_2 + I_3 R_3 = 58V$

1-15.

$U_V = 6V$

$R_1 = 4\Omega$

$R_2 = 2\Omega$

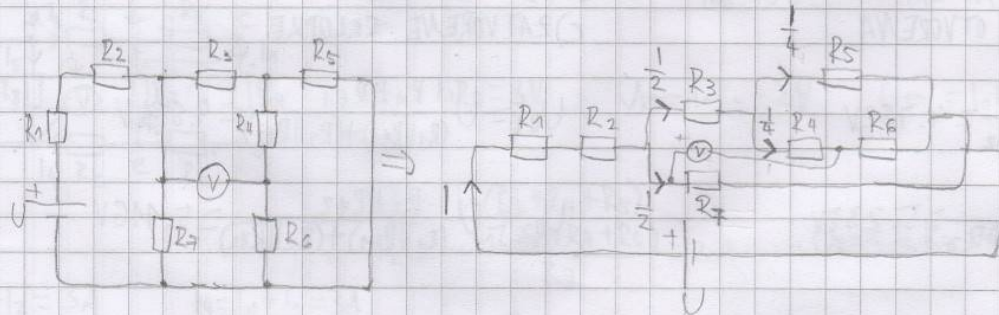
$R_3 = 3\Omega$

$R_4 = 6\Omega$

$R_5 = 10\Omega$

$R_6 = 4\Omega$

$R_7 = 8\Omega$



$U_V = -U_{R6} + U_{R7}$
 $= -\frac{1}{4} I_{R6} + \frac{1}{2} I_{R7}$

$R_{UK} = R_1 + R_2 + R_7 \parallel (R_3 + R_5 \parallel (R_4 + R_6))$

$R_{UK} = 10\Omega$

$6 = -1 + 4I$
 $I = 2A$

$P = I^2 R = 40W$

AKO PRIKLJUČIMO STRUJNI IZVOR OD 4A $I = 4$

$U_V = -U_{R6} + U_{R7}$

$= -\frac{1}{4} I_{R6} + \frac{1}{2} I_{R7}$

$= 12V$

1-16.

$I_1 = 1A$

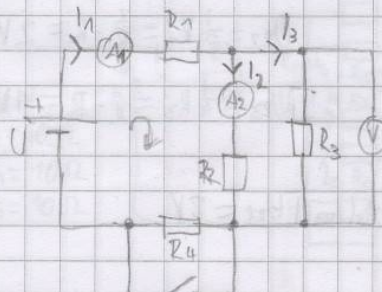
$I_2 = 0.6A$

$U_V = 6V$

$U = 12V$

$R_4 = 6\Omega$

$R_1, R_2, R_3 = ?$



$I_1 = I_2 + I_3$
 $I_3 = 0.4A$

$U_V = I_3 R_3 = I_2 R_2$

$R_3 = \frac{U_V}{I_3} = 15\Omega$

$R_2 = \frac{U_V}{I_2} = 10\Omega$

$U = I_1 R_1 + I_2 R_2$

$R_1 = \frac{U - I_2 R_2}{I_1}$

$R_1 = 6\Omega$

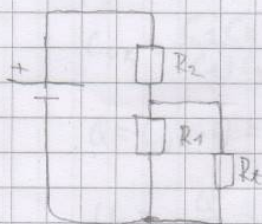
$R_{UK} = R_1 + (R_2 \parallel R_3) + R_4 = 18\Omega$

$I_{R1} = \frac{U}{R_{UK}} = 0.667A$

$U_V = I_{R2} \cdot R_2 = 4V$

$I_{R2} = I_{R1} \cdot \frac{R_3}{R_2 + R_3} = 0.4A$

1-17.
 $R_1 = 55 \Omega$
 $d = 0.3 \text{ m}$
 $R = 55 \Omega$
 $x = ?$
 a) $U_x = 0.25U$
 b) $U_x = 0.5U$
 c) $U_x = 0.75U$



$$R_1 + R_2 = R$$

$$R_1 = \frac{x}{d} R$$

$$R_2 = \left(1 - \frac{x}{d}\right) R$$

a) $U_x = 0.25U \Rightarrow R_2 = 3(R_1 \parallel R_x)$

$$R_2 = 3 \frac{R_1 R_x}{R_1 + R_x}$$

$$R - R_1 = 3 \frac{R_1 R_x}{R_1 + R_x}$$

$$(R - R_1)(R_1 + R_x) = 3R_1 R_x$$

$$RR_1 + RR_x - R_1^2 - R_1 R_x = 3R_1 R_x$$

$$R_1^2 + R_1(4R_x - R) - RR_x = 0$$

$$R_1 = 16.65 \Omega$$

$$x = \frac{R_1 \cdot d}{R} = 9.1 \text{ cm}$$

b) $U_x = 0.5U \Rightarrow R_2 = R_1 \parallel R_x$

$$R - R_1 = \frac{R_1 R_x}{R_1 + R_x}$$

$$R_1 = 33.99 \Omega$$

$$x = \frac{R_1 \cdot d}{R} = 18.5 \text{ cm}$$

c) $U_x = 0.75U \Rightarrow 3R_2 = R_1 \parallel R_x$

$$3(R - R_1) = \frac{R_1 R_x}{R_1 + R_x}$$

$$3RR_1 + 3RR_x - 3R_1^2 - 3R_1 R_x = R_1 R_x$$

$$3R_1^2 + R_1(4R_x - 3R) - 3RR_x = 0$$

$$R_1 = 46.59 \Omega$$

$$x = \frac{R_1 \cdot d}{R} = 25.4 \text{ cm}$$

1-18.
 $R_1 = 10 \Omega$
 $U = 12 \text{ V}$

$$\text{MAX SINAGT} \Rightarrow R_1 = R_2$$

$$I = \frac{U}{R_1 + R_2} = 0.6 \text{ A}$$

b) $P_{\text{max}} = I^2 R_2 = 3.6 \text{ W}$

c) $P = \frac{1}{2} P_{\text{max}} = 1.8 \text{ W}$

$$P = I^2 R_2 \quad U = I(R_2 + R) \quad I = \frac{U}{R_2 + R}$$

$$P = \left(\frac{U}{R_2 + R}\right)^2 R_2$$

$$P(R_2^2 + 2R_2 R + R^2) = U^2 R_2$$

$$PR_2^2 + R_2(2PR - U^2) + PR^2 = 0$$

$$R_{21} = 58.28 \Omega \quad R_{22} = 1.72 \Omega$$

d) $I_w = \frac{U}{R} = 1.2 \text{ A}$

III.2

2-1.
 $\frac{C_2}{C_1} = ?$

a) $U_2 = U \frac{C_1}{C_1 + C_2}$

b) $U_2 = 9U_2 \frac{C_1}{C_1 + C_2}$

a) $U = 2$
 U_2

$U_2 = 2U_2 \frac{C_1}{C_1 + C_2}$

$C_1 + C_2 = 9C_1$
 $C_2 = 8C_1$

b) $U = 9$
 U_2

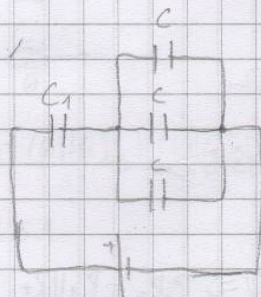
$C_1 + C_2 = 2C_1$

$\frac{C_2}{C_1} = 8$

$C_1 = C_2$

$\frac{C_2}{C_1} = 1$

2-3.
 $C_{\text{ox}} = ?$
 $U_{C1} = ?$
 $C = 10 \text{ nF}$
 $C_1 = 30 \text{ nF}$
 $U = 10 \text{ V}$



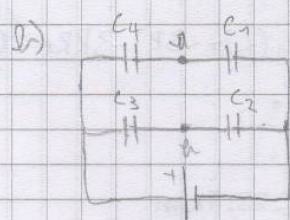
$C_{11} = 3C = 30 \text{ nF}$

$C_{\text{ox}} = \frac{C_1 C_{11}}{C_1 + C_{11}} = 15 \text{ nF}$

$U_{C1} = U \frac{C_1}{C_1 + C_{11}} = 5 \text{ V}$

2-4.
 $U_{\text{ab}} = ?$
 $C_1 = C_2 = 30 \text{ nF}$
 $C_3 = C_4 = 60 \text{ nF}$
 $U = 90 \text{ V}$

$C_1 \cdot C_2 = C_3 \cdot C_4 \Rightarrow \text{MOST U RAVNOTEŽI} \Rightarrow U_{\text{ab}} = 0$



$C_{14} = \frac{C_1 C_4}{C_1 + C_4} = 20 \text{ nF}$

$Q_1 = Q_2 = U C_{14} = 1.8 \cdot 10^{-16}$

$U_{C3} = \frac{Q_1}{C_3} = 60 \text{ V}$ $U_{C4} = \frac{Q_2}{C_4} = 30 \text{ V}$

$C_{23} = \frac{C_2 C_3}{C_2 + C_3} = 20 \text{ nF}$

$U_{\text{ab}} = U_{C3} - U_{C4} = 30 \text{ V}$

2-5.
 $U = 200 \text{ V}$
 $n = 100$
 $W_{\text{ox}} = 0.1 \text{ J}$
 $C_1, C_2 = ?$

$U_{C2} = \frac{U}{n} = 200 \text{ V}$

$U_2 = U \frac{C_1}{C_1 + C_2}$

$W_{\text{ox}} = \frac{C_{\text{ox}} U^2}{2}$

$C_1 + C_2 = \frac{U C_1}{U_2}$

$C_1 + C_2 = \frac{U C_1}{U_2}$

$\frac{C_1 C_2}{C_1 + C_2} = \frac{2 W_{\text{ox}}}{U^2}$

$C_1 U_2 + C_2 U_2 - U C_1 = 0$

$C_1 (U_2 - U) + C_2 U = 0$

$C_1 = \frac{C_2 U}{U - U_2}$

$C_1 = 5.05 \cdot 10^{-10} \text{ F}$

$\frac{C_1 C_2}{U_2} = \frac{2 W_{\text{ox}}}{U^2}$

$C_2 = \frac{2 W_{\text{ox}}}{U U_2}$

$C_2 = 5 \cdot 10^{-8} \text{ F}$

2-6.

$$C_1 = 2.2 \text{ nF}$$

$$C_2 = 330 \text{ nF}$$

$$C_V = 150 \text{ pF}$$

$$U = 100 \text{ V}$$

$$C_{11} = 480 \text{ nF}$$

$$C_{VK} = \frac{C_1 C_{11}}{C_1 + C_{11}} = 3.94 \cdot 10^{-10}$$

$$Q = C_{VK} \cdot U = 3.94 \cdot 10^{-8}$$

$$U_{11} = \frac{Q}{C_{11}} = 82.1 \text{ V}$$

$$C_{VK} = \frac{C_1 C_2}{C_1 + C_2} = 2.87 \cdot 10^{-10}$$

$$Q = C_{VK} \cdot U = 2.87 \cdot 10^{-8}$$

$$U_{C2} = \frac{Q}{C_2} = 86.36 \text{ V}$$

$$\text{ABSOLUTNA GREŠKA} = U_{11} - U_{C2} = -4.867 \text{ V}$$

$$\text{RELATIVNA} = \left(1 - \frac{U_{11}}{U_{C2}}\right) \cdot 100\% = 5.6\%$$

2-7.

$$a) C_1 = ?$$

$$b) U = ?$$

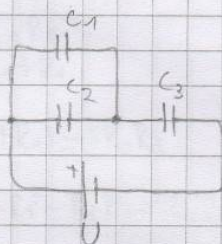
$$c) C_{VK} = ?$$

$$C_2 = 5 \text{ nF}$$

$$C_3 = 1 \text{ nF}$$

$$Q_{C1} = 100 \text{ nC}$$

$$U_{C3} = 20 \text{ V}$$



$$Q_{C3} = U_{C3} \cdot C_3 = 2.2 \cdot 10^{-8}$$

$$Q_{C1} + Q_{C2} = Q_{C3}$$

$$Q_{C2} = 1.2 \cdot 10^{-8}$$

$$U_{C2} = \frac{Q_{C2}}{C_2} = 24 \text{ V} = U_{C1}$$

$$C_1 = \frac{Q_{C1}}{U_{C1}} = 4.17 \cdot 10^{-6} \text{ F}$$

$$U = U_{C2} + U_{C3} = 44 \text{ V}$$

$$C_{VK} = \frac{(C_1 + C_2) C_3}{C_1 + C_2 + C_3} = 4.998 \cdot 10^{-6} \text{ F}$$

2-8.

$$Q_{C4} = ?$$

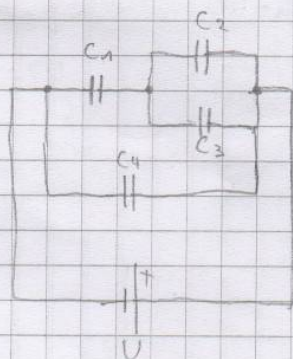
$$Q_1 = 10 \text{ nC}$$

$$C_1 = 1 \text{ nF}$$

$$C_2 = 2 \text{ nF}$$

$$C_3 = 3 \text{ nF}$$

$$C_4 = 4 \text{ nF}$$



$$U_{C1} = \frac{Q_1}{C_1} = 10 \text{ V}$$

$$U_{C4} = U_{C1} + U_{C23} = 12 \text{ V}$$

$$Q_{C4} = U_{C4} \cdot C_4 = 48 \text{ nC}$$

$$U_{C1} \cdot C_1 = U_{C23} \cdot (C_2 + C_3)$$

$$U_{C23} = \frac{U_{C1} C_1}{C_2 + C_3} = 2 \text{ V}$$

2-9.

$$C_1 = 10 \text{ nF}$$

$$U = 10 \text{ V}$$

$$W_{\text{max}} \Rightarrow C_1 = C_2 = 10 \text{ nF}$$

$$U_{C2} = U \cdot \frac{C_1}{C_1 + C_2} = 5 \text{ V}$$

$$W_{\text{max}} = \frac{C_2 U_{C2}^2}{2} = 1.25 \cdot 10^{-7} \text{ J}$$