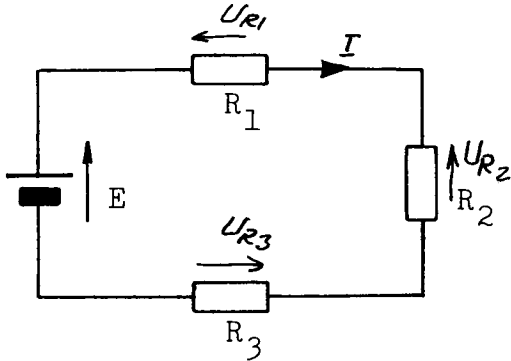


M-ELT 1, jævnstrømskredsløb.

Bestem for hver af de tre kredsløb de anførte strømme og spændinger. Bestem den i hver modstand afsatte effekt samt batteriets afgivne effekt. Påfør strøm- og spændingspile.

Data:  $E = 90 \text{ V}$ ,  $R_1 = 10 \Omega$ ,  $R_2 = 15 \Omega$ ,  $R_3 = 20 \Omega$ .



$$I = \frac{E}{\Sigma R} = \frac{90}{10+15+20} = \frac{90}{45} = 2,00 \text{ A}$$

$$U_{R1} = I \cdot R_1 = 2,00 \cdot 10 = 20 \text{ V}$$

$$U_{R2} = I \cdot R_2 = 2,00 \cdot 15 = 30 \text{ V}$$

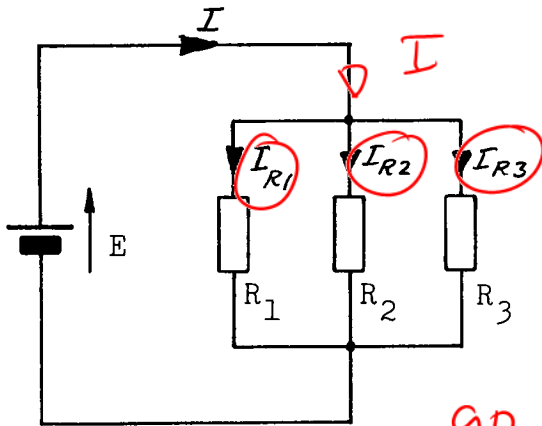
$$U_{R3} = I \cdot R_3 = 2,00 \cdot 20 = 40 \text{ V}$$

$$P_{R1} = I^2 \cdot R_1 = 2,00^2 \cdot 10 = 40 \text{ W}$$

$$P_{R2} = I^2 \cdot R_2 = 2,00^2 \cdot 15 = 60 \text{ W}$$

$$P_{R3} = I^2 \cdot R_3 = 2,00^2 \cdot 20 = 80 \text{ W}$$

$$P = P_{R1} + P_{R2} + P_{R3} = 40 + 60 + 80 = 180 \text{ W}$$



$$I_{R1} = \frac{E}{R_1} = \frac{90}{10} = 9,0 \text{ A}$$

$$I_{R2} = \frac{E}{R_2} = \frac{90}{15} = 6,0 \text{ A}$$

$$I_{R3} = \frac{E}{R_3} = \frac{90}{20} = 4,5 \text{ A}$$

$$I = I_{R1} + I_{R2} + I_{R3} = 9,0 + 6,0 + 4,5 = 19,5 \text{ A}$$

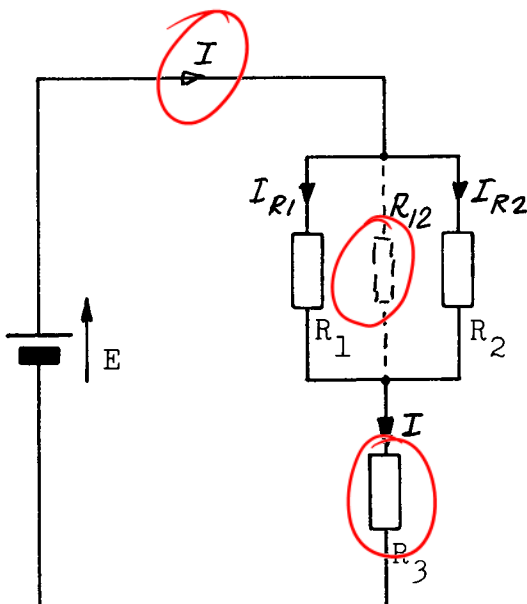
$$P_{R1} = I_1^2 \cdot R_1 = 9,0^2 \cdot 10 = 810 \text{ W}$$

$$P_{R2} = I_2^2 \cdot R_2 = 6,0^2 \cdot 15 = 540 \text{ W}$$

$$P_{R3} = I_3^2 \cdot R_3 = 4,5^2 \cdot 20 = 405 \text{ W}$$

$$P = \Sigma P = 810 + 540 + 405 = 1.755 \text{ W}$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \quad I = \frac{90}{4,6} = 19,5$$



$$1) I = I_{R3} = \frac{E}{R_{12} + R_3} = \frac{90}{6,0 + 20} = 3,46 \text{ A}$$

$$4) I_{R1} = \frac{U_{R1}}{R_1} = \frac{20,8}{10} = 2,08 \text{ A}$$

$$5) I_{R2} = \frac{U_{R2}}{R_2} = \frac{20,8}{15} = 1,38 \text{ A}$$

$$3) U_{R1} = U_{R2} = E - U_{R3} = 90 - 69,2 = 20,8 \text{ V}$$

$$2) U_{R3} = I \cdot R_3 = 3,46 \cdot 20 = 69,2 \text{ V}$$

$$P_{R1} = I_1^2 \cdot R_1 = 2,08^2 \cdot 10 = 43,1 \text{ W}$$

$$P_{R2} = I_2^2 \cdot R_2 = 1,38^2 \cdot 15 = 28,8 \text{ W}$$

$$P_{R3} = I^2 \cdot R_3 = 3,46^2 \cdot 20 = 240,0 \text{ W}$$

$$P = E \cdot I = 90 \cdot 3,46 = 312,0 \text{ W}$$

$$R_{12} = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{10 \cdot 15}{10 + 15} = 6,0 \Omega$$