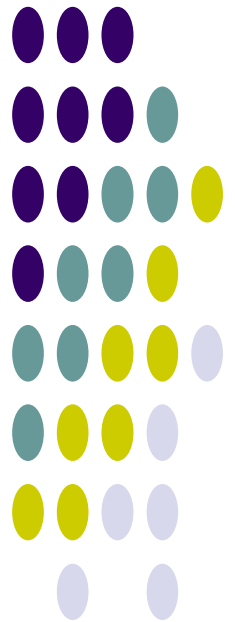


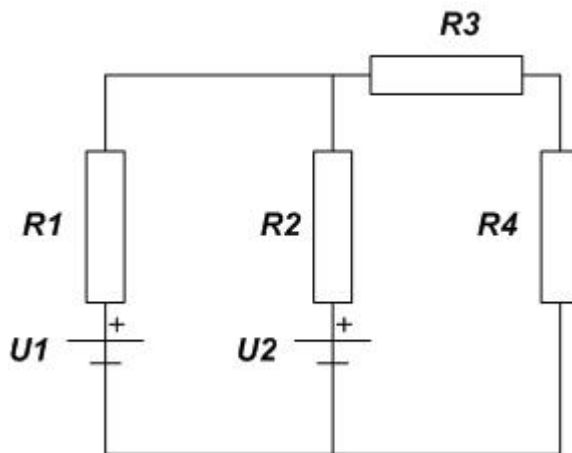
Istosmjerna struja 3

- Ohmov zakon
- Spajanje otpornika
- Strujni i naponski izvori
- II. Kirchhoffov zakon

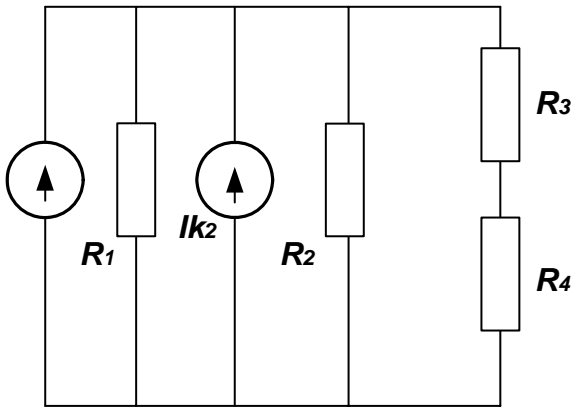


1. zadatak

Odredi kolika se snaga troši na otporu $R4$ ako su zadani elementi mreže spojeni prema slici: $U1=U2=12V$, $R1=0,2\Omega$, $R2=0,3\Omega$, $R3=0,1\Omega$, $R4=0,2\Omega$.



Rješenje zadatka



$$I_1 = U_1 / R_1 = 12 / 0,2 = 60A$$

$$I_2 = U_2 / R_2 = 12 / 0,3 = 40A$$

$$1/R_{uk} = 1/R_1 + 1/R_2 = R_{uk} = 0,12\Omega$$

$$I_{uk} = I_1 + I_2 = 100A$$

$$U_{uk} = I_{uk} \cdot R_{uk} = 100 \cdot 0,12 = 12V$$

$$R_{34} = R_3 + R_4 = 0,3\Omega$$

$$I_4 = U_{uk} / R_{uk} + R_3 + R_4 = 28.57A$$

$$P_4 = I_4^2 \cdot R_4 = 163.26W$$

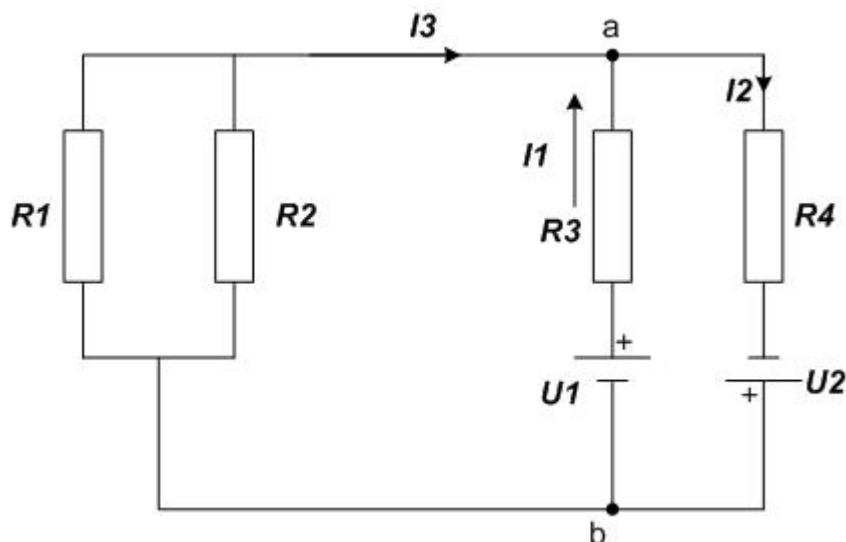




2. zadatak

Zadane su vrijednosti za napone izvora i otpore spojene prema shemi na slici. Treba odrediti:

- struje grane (I_1, I_2, I_3) i
- razvijene snage na radnim otporima.



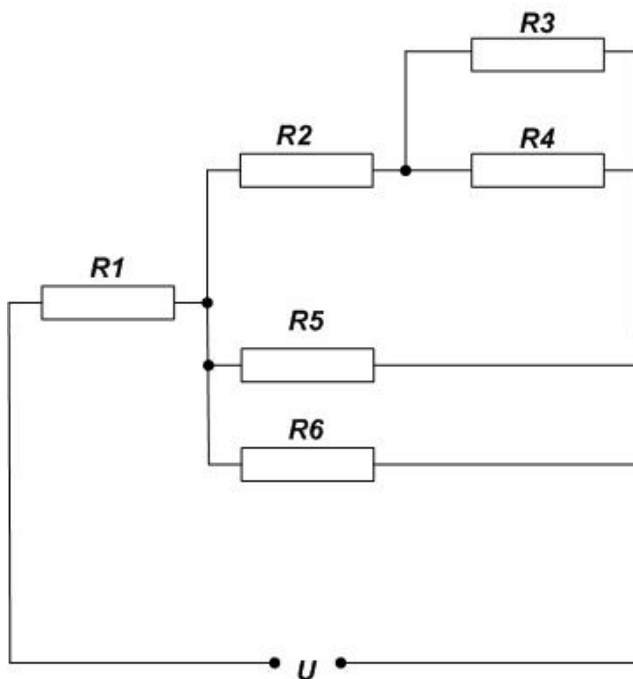
$U_1=150\text{V}$
 $U_2=120\text{V}$
 $R_1=4\Omega$
 $R_2=12\Omega$
 $R_3=6\Omega$
 $R_4=3\Omega$

Kako bi odredili struje grana, treba naći napon između a i b.

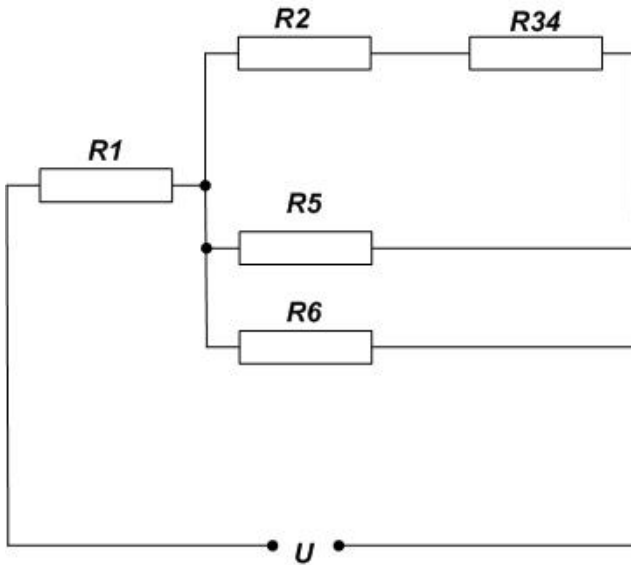


3. zadatak

Zadan je krug prema shemi na slici. Zadano je $R_1=1\Omega$, $R_2=6\Omega$, $R_3=9\Omega$, $R_4=3\Omega$, $R_5=11\Omega$, $R_6=3\Omega$, te $I_2=4A$. Treba odrediti napon izvora U , te struje I_1 , I_3 , I_4 , I_5 i I_6 .



Rješenje zadatka



$$U_2 = I_2 \cdot R_2 = 24\text{V}$$

$$R_{34} = \frac{R_3 \cdot R_4}{R_3 + R_4} = \frac{9 \cdot 3}{9 + 3} = 2.25\Omega$$

$$U_{34} = I_2 \cdot R_{34} = 9\text{V}$$

$$U_5 = U_2 + U_{34} = 33\text{V}$$

$$U_6 = 33\text{V}$$

$$I_5 = \frac{U_5}{R_5} = \frac{33}{11} = 3\text{A}$$

$$I_{56} = I_5 + I_6 = 14\text{A}$$

$$I_1 = I_2 + I_{56} = 18\text{A}$$

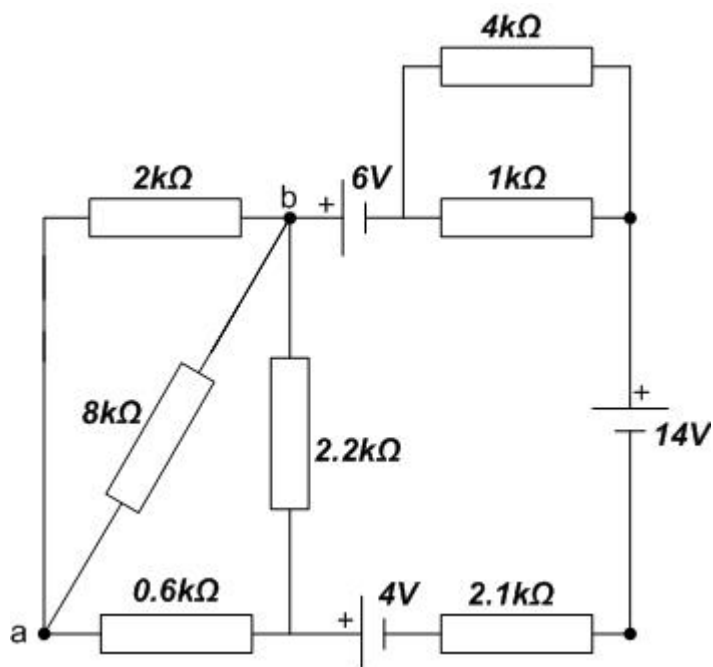
$$I_6 = \frac{U_6}{R_6} = \frac{33}{3} = 11\text{A}$$

$$U_1 = I_1 \cdot R_1 = 18\text{V}$$

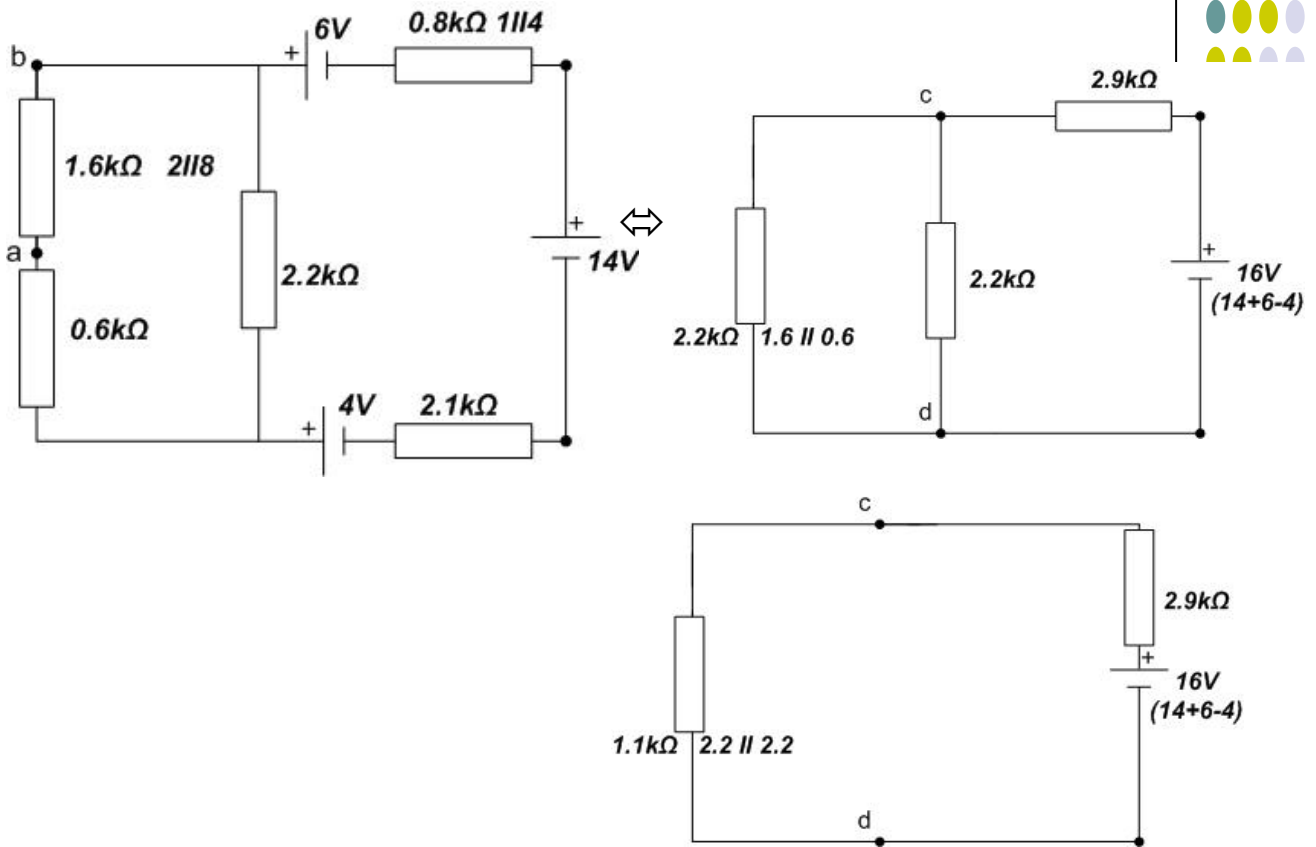
$$U_{uk} = U_1 + U_{56} = 51\text{V}$$

4. zadatak

Odredite napon između točaka a i b sa slike:



Nadomjesna shema



$$I' = 16 / (1.1k\Omega + 2.9k\Omega) = 4mA$$

$$U_{cd} = I' \cdot 1.1k\Omega = 4.4V$$

$$I = U_{cd} / (1.6k\Omega + 0.6k\Omega) = 2mA$$

$$U_{ab} = I \cdot 1.6k\Omega = 3.2V$$