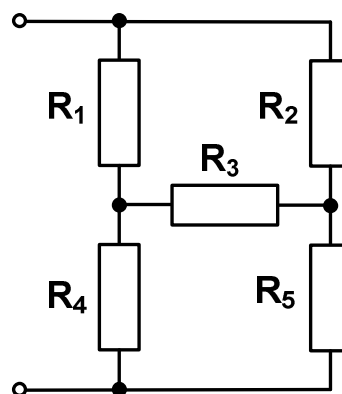


Module name: **Electrical Circuits 1**
 Module ID: **IS-FEE-10070W**
 Module type: **Class**
 Semester: **winter 2024/2025**
 Instructor: **Jarosław Forenc, j.forenc@pb.edu.pl**

Class 02 (14.10.2024)

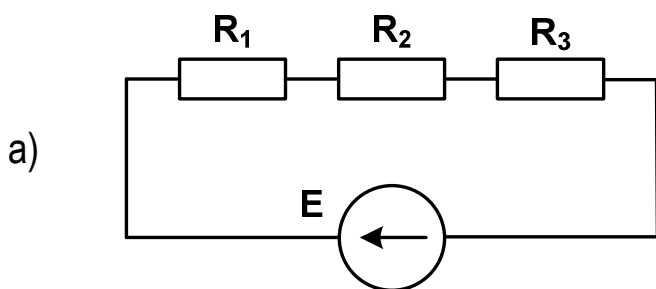
1. Calculate the equivalent resistance of the circuit.

$$R_1 = R_2 = R_3 = R_4 = R_5 = R$$

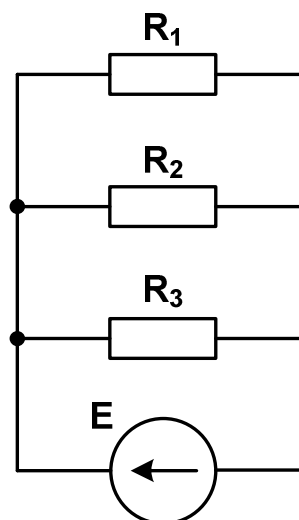


2. Calculate the voltage drops and currents in the branches of the circuit shown in the figures.

$$E = 12 \text{ V}, R_1 = 1 \text{ k}\Omega, R_2 = 5 \text{ k}\Omega, R_3 = 10 \text{ k}\Omega.$$



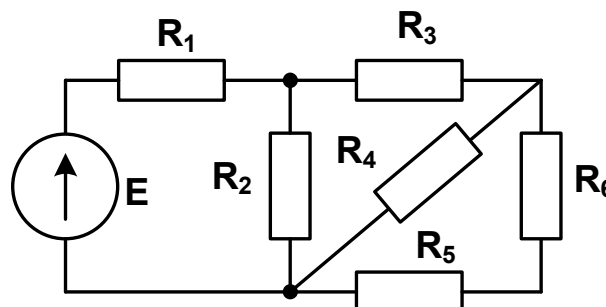
b)



3. The voltage drop across R_6 is 30 V. Calculate the voltage E , the current through the voltage source, and the equivalent resistance of the circuit.

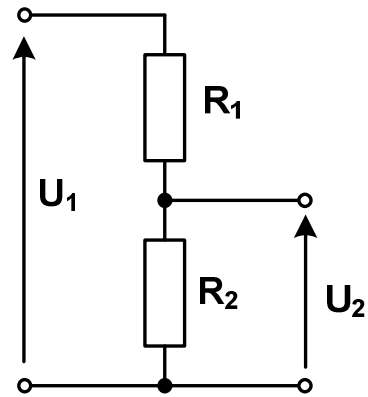
$$R_1 = 2.4 \text{ }\Omega, R_2 = 4 \text{ }\Omega, R_3 = 1 \text{ }\Omega,$$

$$R_4 = 2.5 \text{ }\Omega, R_5 = 2 \text{ }\Omega, R_6 = 3 \text{ }\Omega.$$



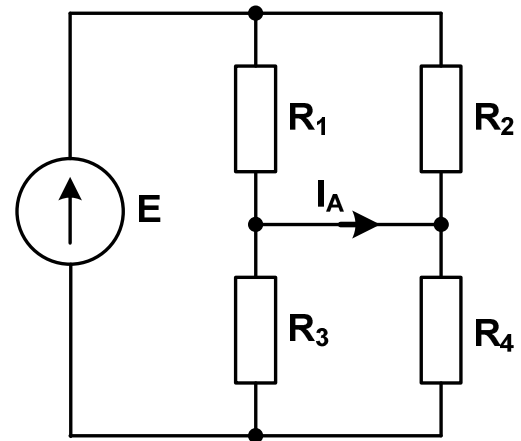
4. Calculate the voltage U_2 for the circuit shown in the figure.

$U_1 = 100 \text{ V}$, $R_1 = 70 \text{ } \Omega$, $R_2 = 30 \text{ } \Omega$.



5. Calculate the current I_A in the circuit presented in the figure.

$E = 120 \text{ V}$, $R_1 = 10 \text{ } \Omega$, $R_2 = 15 \text{ } \Omega$, $R_3 = 60 \text{ } \Omega$,
 $R_4 = 40 \text{ } \Omega$



6. There are 4 bulbs installed in the rear lamp of a car:

- indicator - type: P21W, rated power: $P_1 = 21 \text{ W}$, rated voltage: $U_n = 12 \text{ V}$,
- break light - type: W16W, rated power: $P_2 = 16 \text{ W}$, rated voltage: $U_n = 12 \text{ V}$,
- parking light - type: W5W, rated power: $P_3 = 5 \text{ W}$, rated voltage: $U_n = 12 \text{ V}$,
- reversing light - type: W16W, rated power: $P_4 = 16 \text{ W}$, rated voltage: $U_n = 12 \text{ V}$.

What should be the nominal current of the fuse protecting the car's lamp circuit?

Standard automotive fuses have the nominal currents of $I_n = 1 \text{ A}$; 2 A ; 3 A ; 4 A ; 5 A ; 7.5 A ; 10 A ; 15 A ; 20 A ; 30 A ; 40 A .

