Module name: **Electrical Circuits 1**
Module ID: **IS-FEE-10070W**
Module type: **Class**
Semester: **winter 2024/2025**
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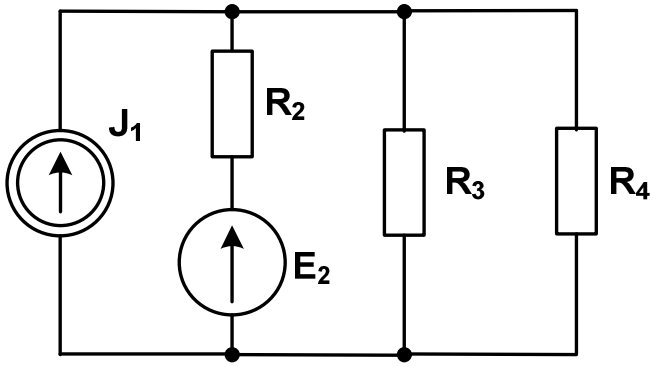
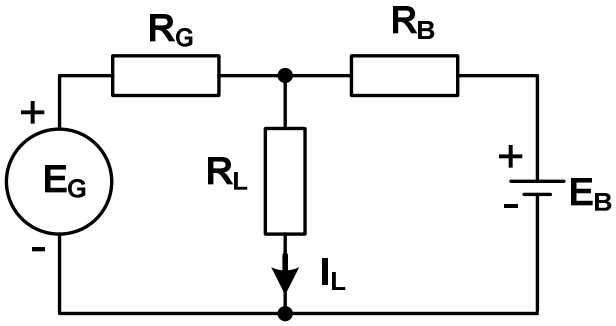
Class 03 (21.10.2024)

1. What should be the minimum power rating of the resistor **R_4** in the circuit shown in the figure?

   J_1 = 1 A, E_2=10 V, R_2 = R_3 = R_4 = 2 Ω

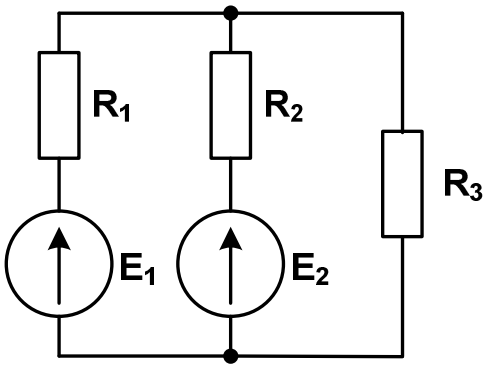


2. An automobile generator with an internal resistance of R_G = 0.2 Ω develops an open-circuit voltage of E_G = 16 V. The storage battery has an internal resistance of R_B = 0.1 Ω and an open-circuit voltage of E_B = 12.8 V. Both sources are connected in parallel to a load R_L = 1 Ω. Determine the load current I_L.



3. Make a power balance for the circuit shown in the figure (i.e., the power provided by the batteries equals the sum of the power dissipated by the resistances).

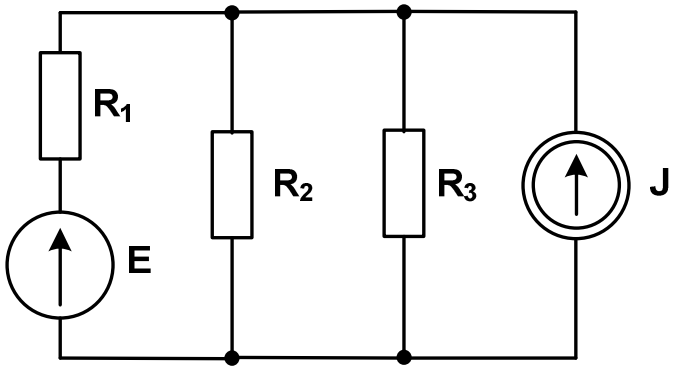
   E_1 = 10 V, R_1 = 4 Ω, E_2 = 12 V, R_2 = 2 Ω, R_3 = 10 Ω



4. Calculate the currents in all branches of the circuit shown in the figure using the **superposition principle**.

E = 4 V, J = 1 A,

$R_1 = 1\ \Omega$, $R_2 = 2\ \Omega$, $R_3 = 2\ \Omega$



5. An automobile generator with an internal resistance of $R_G = 0.2\ \Omega$ develops an open-circuit voltage of $E_G = 16$ V. The storage battery has an internal resistance of $R_B = 0.1\ \Omega$ and an open-circuit voltage of $E_B = 12.8$ V. Both sources are connected in parallel to a load $R_L = 1\ \Omega$. Determine the load current I_L using the **superposition principle**.