

Ω csoport

1. feladat

$$R = 800 \, \Omega$$

$$U = 230 \, \text{V}$$

$$I = ? \, [\text{A}]$$

$$I = \frac{U}{R} = \frac{230}{800} = \underline{0,288 \, \text{A}}$$

2. feladat

$$R = 100 \, \Omega$$

$$d = 0,08 \, \text{mm}$$

$$\rho_{\text{CU}} = 0,0175 \, \Omega\text{mm}^2/\text{m}$$

$$l = ? \, [\text{m}]$$

$$A = \frac{d^2 \cdot \pi}{4} = \frac{0,08^2 \cdot \pi}{4} = 5,027 \cdot 10^{-3} \, \text{mm}^2$$

$$R = \frac{\rho_{\text{CU}} \cdot l}{A}$$

$$l = \frac{R \cdot A}{\rho_{\text{CU}}} = \frac{100 \cdot 0,005027}{0,0175} = \underline{28,726 \, \text{m}}$$

3. feladat

$$l = 20 \, \text{m}$$

$$d = 1 \, \text{mm}$$

$$I = 300 \, \text{mA} = 0,3 \, \text{A}$$

$$\rho_{\text{AL}} = 0,03 \, \Omega\text{mm}^2/\text{m}$$

$$U = ? \, [\text{V}]$$

$$A = \frac{d^2 \cdot \pi}{4} = \frac{1^2 \cdot \pi}{4} = 0,785 \, \text{mm}^2$$

$$R = \frac{\rho_{\text{AL}} \cdot l}{A} = \frac{0,03 \cdot 20}{0,785} = 0,764 \, \Omega$$

$$U = I \cdot R = 0,3 \cdot 0,764 = \underline{0,229 \, \text{V}}$$

p csoport

1. feladat

$$R = 21 \, \Omega$$

$$I = 0,3 \, \text{A}$$

$$U = ? \, [\text{V}]$$

$$\underline{U = I \cdot R = 0,3 \cdot 21 = 6,3 \, \text{V}}$$

2. feladat

$$R = 100 \, \Omega$$

$$l = 25 \, \text{m}$$

$$\rho_{\text{AL}} = 0,03 \, \Omega\text{mm}^2/\text{m}$$

$$d = ? \, [\text{mm}]$$

$$R = \frac{\rho_{\text{AL}} \cdot l}{A}$$

$$A = \frac{\rho_{\text{AL}} \cdot l}{R} = \frac{0,03 \cdot 25}{100} = 0,0075 \, \text{mm}^2$$

$$A = \frac{d^2 \cdot \pi}{4}$$

$$\underline{d = \sqrt{\frac{A \cdot 4}{\pi}} = \sqrt{\frac{0,0075 \cdot 4}{\pi}} = 0,0977 \, \text{mm}}$$

3. feladat

$$I = 1 \, \text{mA} = 0,001 \, \text{A}$$

$$U = 0,4 \, \text{V}$$

$$\rho_{\text{CU}} = 0,0175 \, \Omega\text{mm}^2/\text{m}$$

$$d = 0,5 \, \text{mm}$$

$$l = ? \, [\text{m}]$$

$$R = \frac{U}{I} = \frac{0,4}{0,001} = 400 \, \Omega$$

$$A = \frac{d^2 \cdot \pi}{4} = \frac{0,5^2 \cdot \pi}{4} = 0,196 \, \text{mm}^2$$

$$R = \frac{\rho_{\text{CU}} \cdot l}{A}$$

$$\underline{l = \frac{R \cdot A}{\rho_{\text{CU}}} = \frac{400 \cdot 0,196}{0,0175} = 4480 \, \text{m}}$$