

A csoport**1. feladat**

$$U = 3 \text{ V}$$

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

$$P = ? \text{ [W]}$$

$$\underline{P = U \cdot I = 3 \cdot 0,1 = 0,3 \text{ W}}$$

2. feladat

$$P = 1,1 \text{ kW} = 1100 \text{ W}$$

$$I = 5 \text{ A}$$

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

$$\underline{U = \frac{P}{I} = \frac{1100}{5} = 220 \text{ V}}$$

3. feladat

$$R = 1,5 \text{ k}\Omega = 1500 \text{ }\Omega$$

$$P = 0,5 \text{ W}$$

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

$$P = I^2 \cdot R$$

$$\underline{I = \sqrt{\frac{P}{R}} = \sqrt{\frac{0,5}{1500}} = \sqrt{0,000333} = 0,0183 \text{ A} = 18,3 \text{ mA}}$$

4. feladat

$$I_1 = 0,5 \text{ A}$$

$$I_2 = 0,4 \text{ A}$$

$$P_1 = I_1^2 \cdot R$$

$$P_2 = I_2^2 \cdot R$$

$$\frac{P_2}{P_1} = \frac{I_2^2 \cdot R}{I_1^2 \cdot R} = \frac{I_2^2}{I_1^2} = \frac{0,4^2}{0,5^2} = 0,64$$

tehát a teljesítmény az eredeti 64 %-a, azaz a teljesítmény 36 %-kal csökkent.

5. feladat

$$P_{\text{leadott}} = 2 \text{ kW} = 2000 \text{ W}$$

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

$$I = 10 \text{ A}$$

$$\eta = ? \text{ [%]}$$

$$P_{\text{felvett}} = \dot{U} \cdot I = 230 \cdot 10 = 2300 \text{ W}$$

$$\eta = \frac{P_{\text{leadott}}}{P_{\text{felvett}}} = \frac{2000}{2300} = 0,87$$

Tehát a motor hatásfoka 87 %.

B csoport

1. feladat

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

$$I = 0,273 \text{ A}$$

$$P = ? \text{ [W]}$$

$$P = U \cdot I = 230 \cdot 0,273 = \underline{62,79 \text{ W}}$$

2. feladat

$$U = 24 \text{ V}$$

$$P = 50 \text{ W}$$

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

$$I = \frac{P}{U} = \frac{50}{24} = \underline{2,083 \text{ A}}$$

3. feladat

$$R = 1 \text{ M}\Omega = 1000000 \text{ }\Omega$$

$$P = 0,25 \text{ W}$$

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

$$P = \frac{U^2}{R}$$

$$U = \sqrt{P \cdot R} = \sqrt{0,25 \cdot 1000000} = \underline{22,361 \text{ V}}$$

4. feladat

$$U_1 = 24 \text{ V}$$

$$U_2 = 20 \text{ V}$$

$$P_1 = \frac{U_1^2}{R}$$

$$P_2 = \frac{U_2^2}{R}$$

$$\frac{P_2}{P_1} = \frac{\frac{U_2^2}{R}}{\frac{U_1^2}{R}} = \frac{U_2^2 \cdot R}{U_1^2 \cdot R} = \frac{U_2^2}{U_1^2} = \frac{20^2}{24^2} = 0,694$$

tehát a teljesítmény az eredeti 69,4 %-a lett, azaz a teljesítmény 30,6 %-kal csökkent.

5. feladat

$$P_{\text{leadott}} = 1,7 \text{ KW} = 1700 \text{ W}$$

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

$$I = 8,696 \text{ A}$$

$$\eta = ? \text{ [%]}$$

$$P_{\text{felvett}} = U \cdot I = 230 \cdot 8,696 = 2000 \text{ W}$$

$$\eta = \frac{P_{\text{leadott}}}{P_{\text{felvett}}} = \frac{1700}{2000} = 0,85$$

Tehát a motor hatásfoka 85 %.

