
ÖVEGES JÓZSEF Fizikaverseny

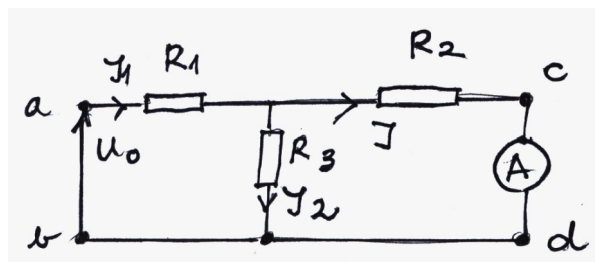
III. forduló

2017. április 8.

VIII. osztály

JAVÍTÓKULCS

I. feladat



$$U_0 = I_1 R_1 + I_2 R_3$$

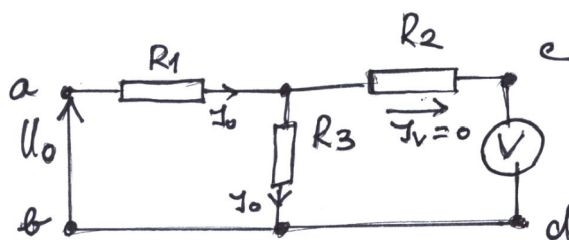
$$R_3 I_2 = R_2 I$$

$$I_1 = I + I_2$$

1 p

1 p

1 p



$$(R_1 + R_3) I_0 = U_0$$

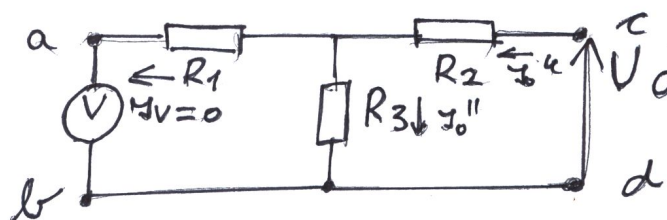
$$R_3 I_0 = U$$

$$U/R_3 = U_0/(R_1 + R_3) \quad U_0/U = (R_1 + R_3)/R_3$$

1 p

1 p

1 p



$$U_0 = I_0'' (R_2 + R_3)$$

$$U = R_3 I_0''$$

$$(R_2 + R_3) R_2 = U_0/U$$

$$R_3 = 2R_2, R_1 = 10 \, \Omega, R_2 = 10 \, \Omega$$

1 p

1 p

1 p

1 p

II. feladat

$$G' + G = F_A \quad 2 \text{ p}$$

$$m_{jég}g + mg = \rho_{vz} \cdot \left(\frac{m_{jég}}{\rho_{jég}} + \frac{m}{\rho_{pb}} \right) \cdot g \quad 3 \text{ p}$$

$$m_{jég} = \frac{m \cdot (\rho_{pb} - \rho_{vz}) \cdot \rho_{jég}}{(\rho_{vz} - \rho_{jég}) \cdot \rho_{pb}} \quad 2 \text{ p}$$

$m_{jég}$ annak maradék jégnek a tömege, melynél a golyó süllyedni kezd.

$$Q = (m_{jég} - m_{jég}) \cdot \lambda = m_{jég} - \frac{m \cdot (\rho_{pb} - \rho_{vz}) \cdot \rho_{jég}}{(\rho_{vz} - \rho_{jég}) \cdot \rho_{pb}} \quad 3 \text{ p}$$

III. feladat

$$a) \rho_1 V_1 g = \rho V'_1 g \Rightarrow V'_1 / V_1 = \rho_1 / \rho = 0,8 \quad 1 \text{ p}$$

$$\rho_2 V_2 g = \rho V'_2 g \Rightarrow V'_2 / V_2 = \rho_2 / \rho = 0,85 \quad 1 \text{ p}$$

$$b) \rho V g = (\rho_1 + \rho_2) L^3 g \Rightarrow V = (\rho_1 + \rho_2) / \rho \cdot L^3 \quad 1 \text{ p}$$

$$f = V / 2L^3 = (\rho_1 + \rho_2) / 2\rho = 0,825 \quad 1 \text{ p}$$

Azonos mindkét esetben az f ! 1 p

$$c) M = 0 \quad 1 \text{ p}$$

$$mgx = (F_A - \rho_2 L^3 g) d \quad 1 \text{ p}$$

$$F_{A1} = F_{A2} = F_A \quad 1 \text{ p}$$

$$F_A = \frac{mg + (\rho_1 + \rho_2) \cdot L^3 \cdot g}{2} \quad 2 \text{ p}$$

$$x = \frac{[m - L^3 \cdot (\rho_2 - \rho_1)] \cdot d}{2m} = 0,75m \quad 1 \text{ p}$$