

1. a) $\frac{1}{C_{12}} = \frac{1}{C_1} + \frac{1}{C_2}$ (4)

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$$C_N = C_{12} + C_3 \quad (4)$$

b) $Q_3 = C_3 U$ (3)

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$$Q_1 = Q_2 \quad \text{ali} \quad U_1 = U_2 = \frac{U}{2} \quad (3)$$

$$Q_1 \text{ in } Q_2 \quad (4)$$

c) + (7)

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$$\Sigma \vec{M} = J \alpha \quad (2)$$

$$J = \frac{ml^2}{12} \quad (2)$$

$$|\vec{M}_r| = F_r r \quad (2)$$

$$r = \frac{l}{2} \quad (1)$$

$$F_r = g x \quad (1)$$

$$x = \frac{l}{2} \sin \varphi \quad (3)$$

$$J \ddot{\varphi} = - g_1 \frac{l^2}{4} \sin \varphi - g_2 \frac{l^2}{4} \sin \varphi \quad (5) \quad (\text{Napajini predznaki: } (-2))$$

$$\sin \varphi \approx \varphi \quad (3) \rightarrow (\text{Lamo napisano brez uporabe } (1))$$

↳ $M = F_r \sin \varphi$ ne velja
kot pravilna uporaba

$$\omega^2 = 3 \frac{g_1 + g_2}{m} \quad (4)$$

(Pravilno razbrano ω ,
ampak napajine enote (3))

$$t_0 = \frac{2\pi}{\omega} \quad (1)$$

Rezultat (1)

$$3.) \quad W_{ep} = W_k \quad (2)$$

$$eU_0 = \frac{1}{2} m v_0^2 \quad (2)$$

$$\Rightarrow v_0 = \sqrt{\frac{2eU_0}{m}} \quad (3)$$

$$v_x: \quad v_0 \rightarrow v_x$$

$$a_x = 0$$

$$v_y:$$

$$F = eE = e \cdot \frac{U}{d} \quad (2)$$

$$a_y = \frac{F}{m} \quad (3)$$

$$t = \frac{l}{v_x} \quad (2)$$

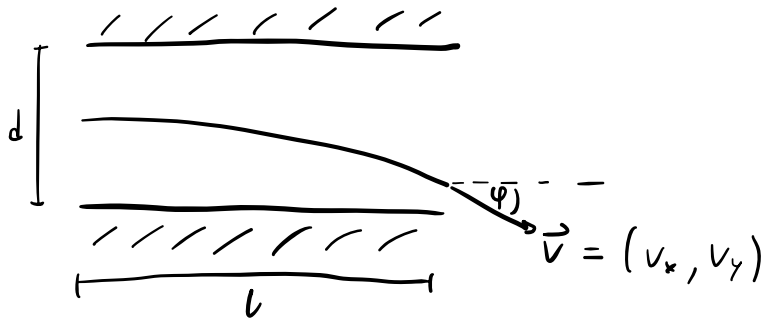
$$v_y = a_y \cdot t = \frac{F}{m} \cdot t = \frac{eU}{m d} \cdot \frac{l}{v_x}$$

$$\tan \varphi = \frac{v_y}{v_x} = \frac{eU l}{m d v_x \cdot v_x} = \frac{eU l}{m d v_0^2} \quad (2) = \frac{\cancel{e} U l \cancel{m}}{\cancel{\mu} d \cdot 2 \cancel{e} U_0} = \frac{U l}{2 d U_0}$$

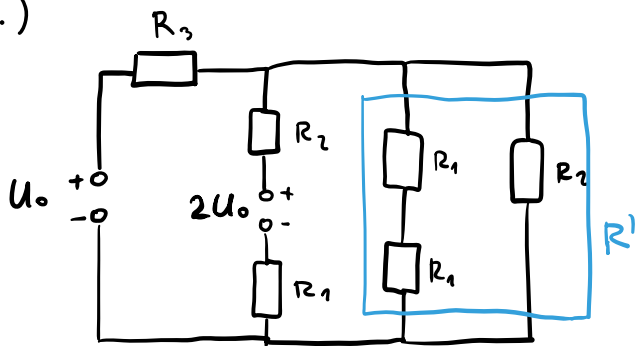
$v_x = v_0$

$$\Rightarrow U = U_0 \frac{2d}{l} \tan \varphi = 10^4 \text{ V} \cdot \frac{2 \cdot 4 \cdot 10^{-3} \text{ m}}{5 \cdot 10^{-3} \text{ m}} \cdot \frac{1}{\sqrt{3}} \approx 9240 \text{ V} \quad (2)$$

(3)

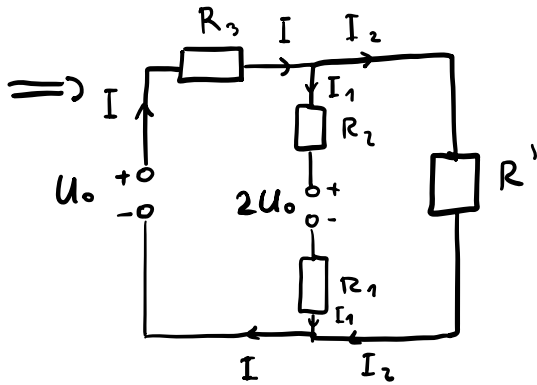


4.)



$$\frac{1}{R'} = \frac{1}{R_2} + \frac{1}{R_1 + R_1} \quad (3)$$

$$R' = \frac{R_1 R_2}{R_1 + \frac{R_2}{2}} = 1 \Omega \quad (2)$$



(5) ... ALI PODOBEN RAZMISLEK

1. KZ: (1) $I = I_1 + I_2$ (2)

2. KZ: (2) $U_0 - IR_3 - I_1 R_2 - 2U_0 - I_1 R_1 = 0$

(3) $U_0 - IR_3 - I_2 R' = 0$ (3)

$$(-I_2 R' + I_1 R_1 + 2U_0 + I_1 R_2 = 0)$$

IŠĆEMO I:

(3): $I = \frac{U_0 - I_2 R'}{R_3}$

(1): $I_2 = I - I_1$

(2): $I_1 = \frac{U_0 - IR_3 - 2U_0}{R_1 + R_2} = -\frac{U_0 + IR_3}{R_1 + R_2}$

(2) → (1): $I_2 = I + \frac{U_0 + IR_3}{R_1 + R_2}$

(2) → (1) → (3): $I = \frac{U_0 - IR' - \frac{R'}{R_1 + R_2} (U_0 + IR_3)}{R_3}$

5. a) $F = \frac{e_1 e_2}{4\pi\epsilon_0 r^2}$ (1)

7 $\lambda = \frac{e}{l} = \frac{e}{R\varphi_0}$ (2) (1) na $\lambda = \frac{e}{R}$

$e_2 = \lambda d$ (1)

$F = \frac{e' e}{4\pi\epsilon_0 R^3 \varphi_0}$ is pravem kotelstu (2)

$F = 9,51 \text{ N}$ (1)

b)

18 Imen (1) (2) $F_x = 0$, (2) $F_y < 0$

$de_2 = \lambda R d\varphi$ (3) (2) je parametrizacija po dl)

Projekcija zaradi vektorske vrste $F_{e,y} = F_e \sin\varphi / \cos\varphi$ (2)

Pravilno nastavljen integral (5)

$F_{e,y} = \frac{e' e}{4\pi\epsilon_0 R^2 \varphi_0} \int_{\pi/6}^{5\pi/6} \cos\varphi d\varphi$

Pravilno poravnani integral (3)

Rezultat (1)
