

Ex. 5.219.

$$l = 1,6 \text{ m}$$

$$R^* = 0,4 \Omega/\text{m}$$

$$\alpha = 1 \text{ m}$$

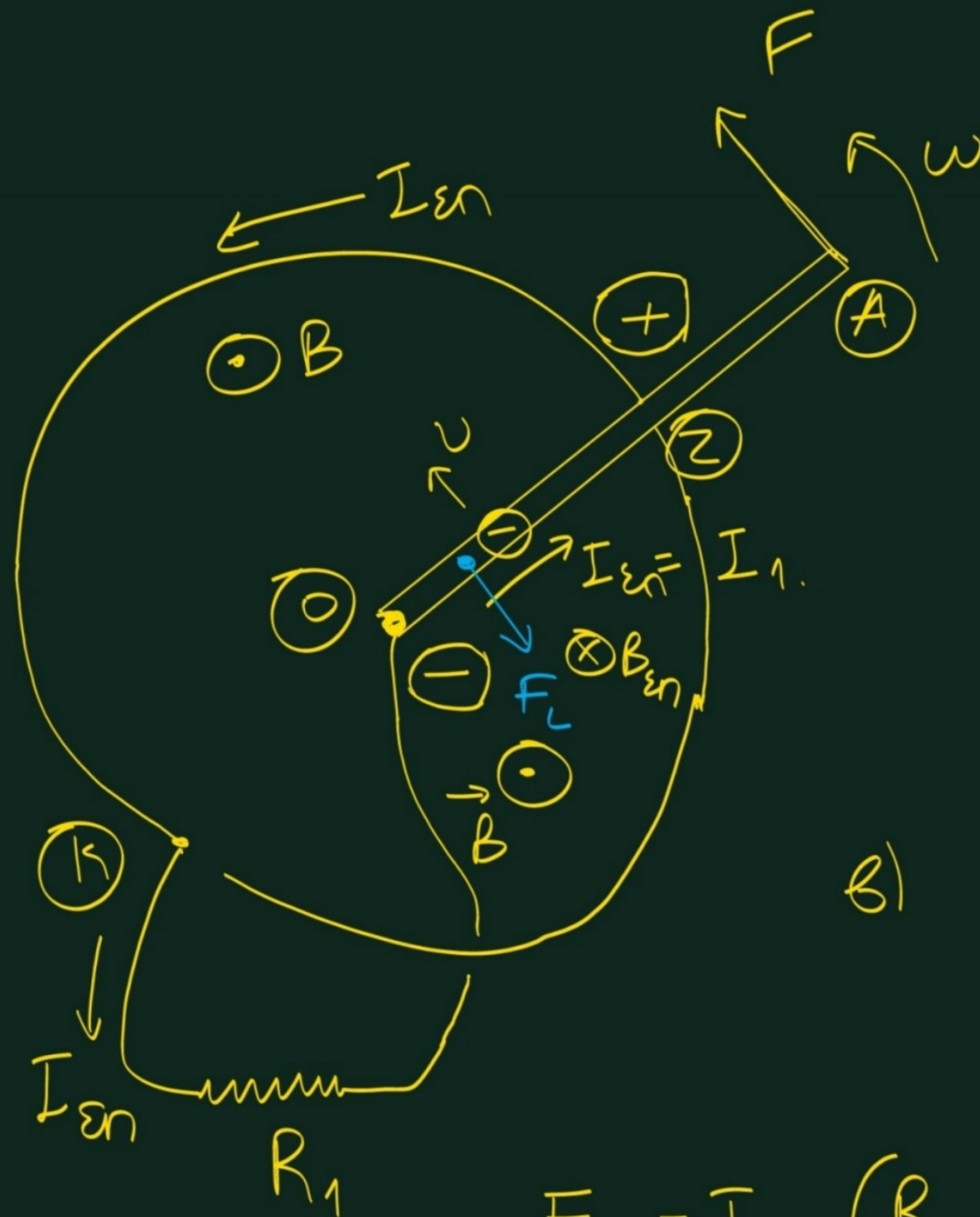
$$R_1 = 0,1 \Omega$$

$$OZ = \alpha$$

$$OA = l$$

$$V_1 = 0,2 \text{ Volt}$$

$$B = 2 \text{ T}$$



$$a) V_1 = I_1 \cdot R_1 \Rightarrow$$

$$0,2 = I_1 \cdot 0,1 \Rightarrow I_1 = 2 \text{ A.}$$

$$F_L = B \cdot OZ \cdot I_1 \Rightarrow$$

$$F_L = B \alpha \cdot I_1 \Rightarrow$$

$$F_L = 2 \cdot 1 \cdot 2 \Rightarrow F_L = 4 \text{ N}$$

$$I_{en} = I_1 = 2 \text{ A.}$$

$$b) R_{OZ} = R^* \cdot OZ = 0,4 \cdot 1 = 0,4 \Omega$$

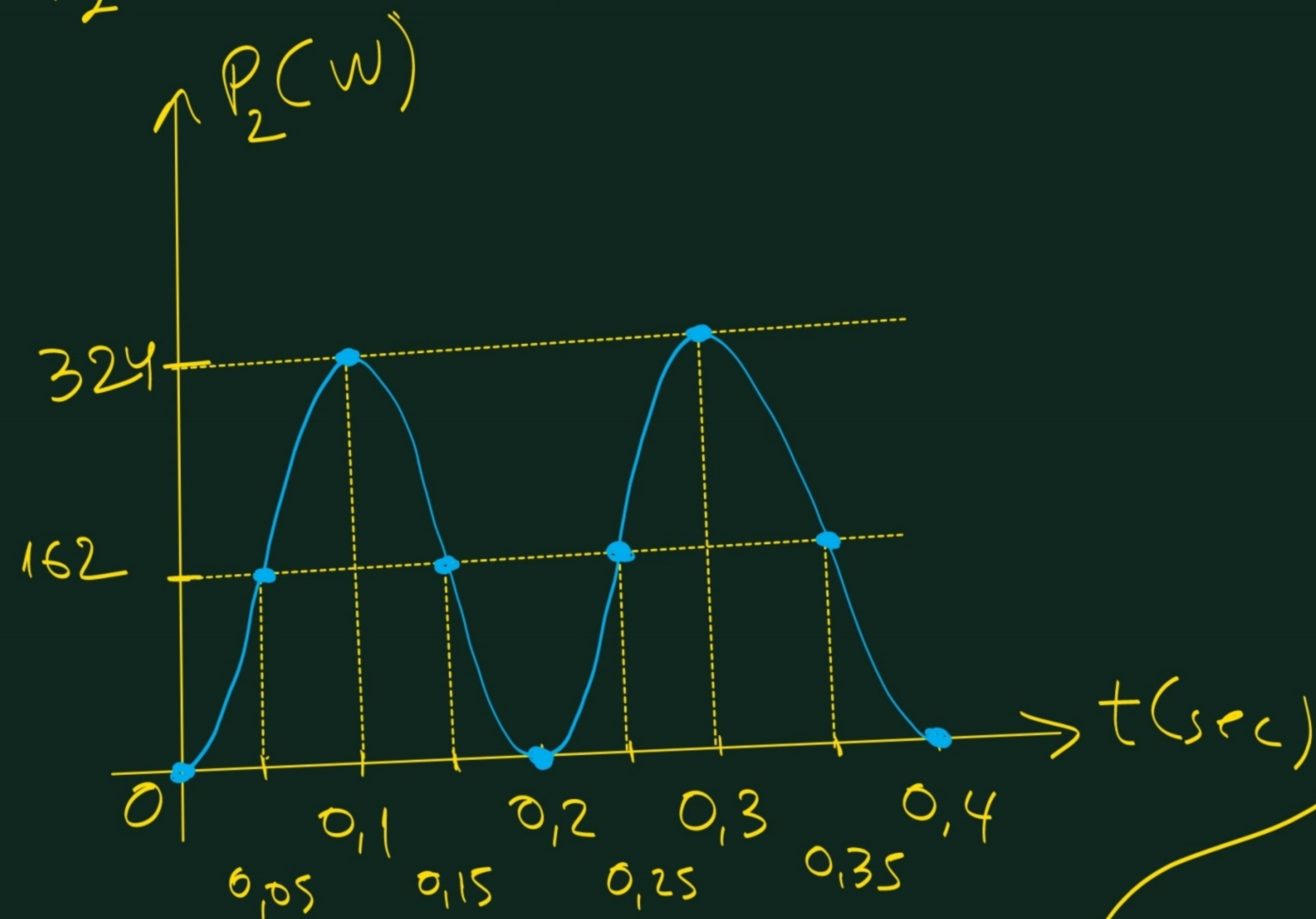
$$R_1 = 0,1 \Omega$$

$$E_{en} = I_{en} (R_{OZ} + R_1) \Rightarrow E_{en} = 2 \cdot (0,4 + 0,1) \Rightarrow$$
$$E_{en} = 1 \text{ Volt}$$

$$P_2(t) = 324 \sin^2(5\pi t) \text{ (SI)}$$

$$T = 0,4 \text{ sec}$$

$$\text{iii) } R_{02} = \frac{R_1 R_2}{R_1 + R_2} = \frac{12 \cdot 4}{12 + 4} = \frac{12 \cdot 4}{16} = \underline{3 \Omega}$$



$$i = i_1 + i_2 = \left(\frac{V}{R_1} + \frac{V}{R_2} \right)$$

$$= \frac{V}{R_{02}} = \frac{V}{R_{02}} \sin(\omega t) =$$

$$i = \frac{36}{3} \sin(5\pi t) = 12 \sin(5\pi t) \text{ (SI)}$$

$$A_1 \propto I = 12 \text{ A} \quad I_{\text{eff}} = \frac{I}{\sqrt{2}} = \frac{12}{\sqrt{2}} = 6\sqrt{2} \text{ A}$$

$$\bar{P} = I^2 \cdot R_{02} = (6\sqrt{2})^2 \cdot 3 = 36 \cdot 6 = 216 \text{ Watt}$$

Άσκ. 5.66 βελ. 225.

$$l = 0,5 \text{ m}$$

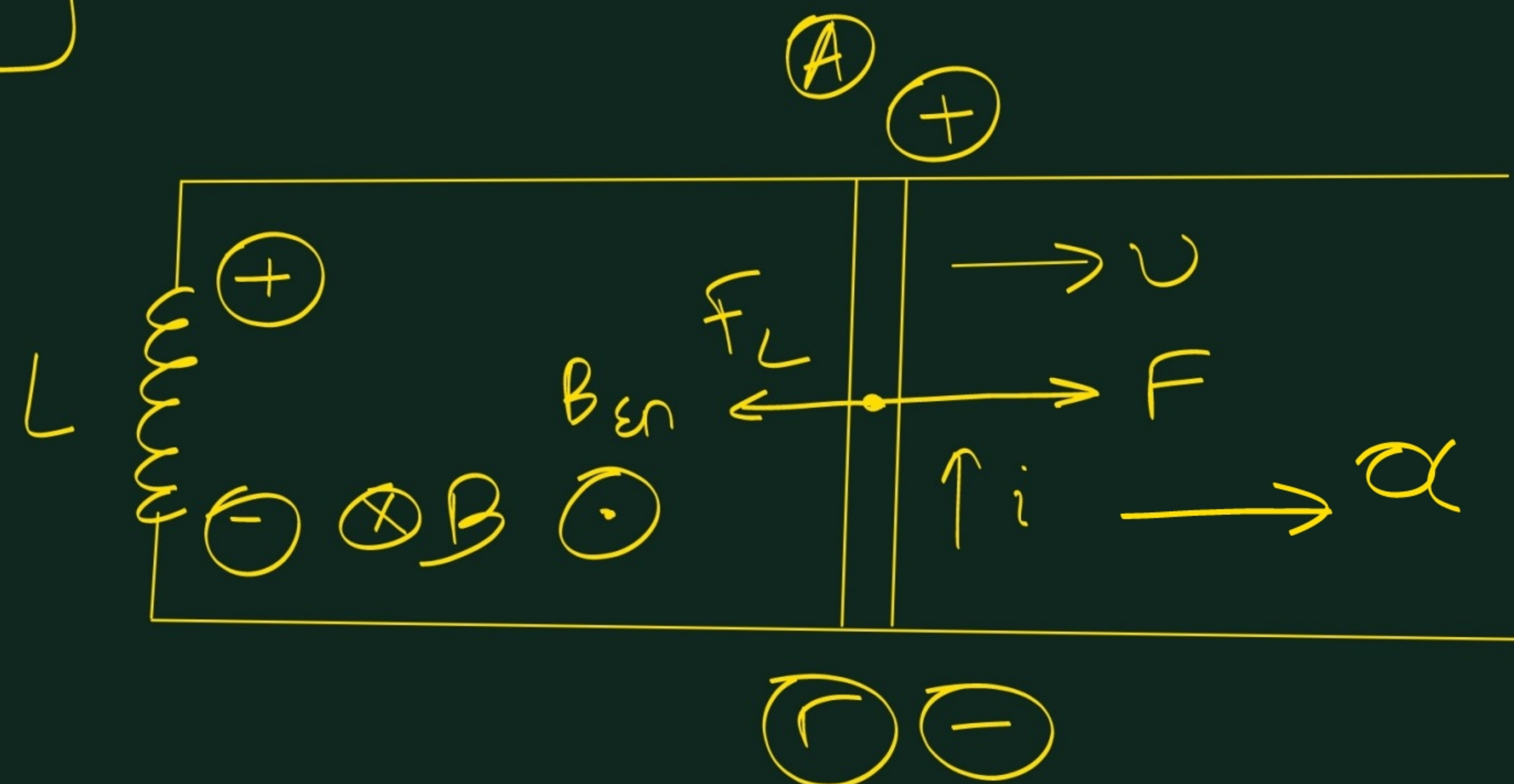
$$L = 25 \cdot 10^{-3} \text{ Henry}$$

$$m = 150 \text{ g} = 0,15 \text{ kg}$$

$$R = 5 \cdot 10^{-2} \Omega$$

$$B = 0,1 \text{ T}$$

$$i = 2t + 3 \text{ (SI)}$$

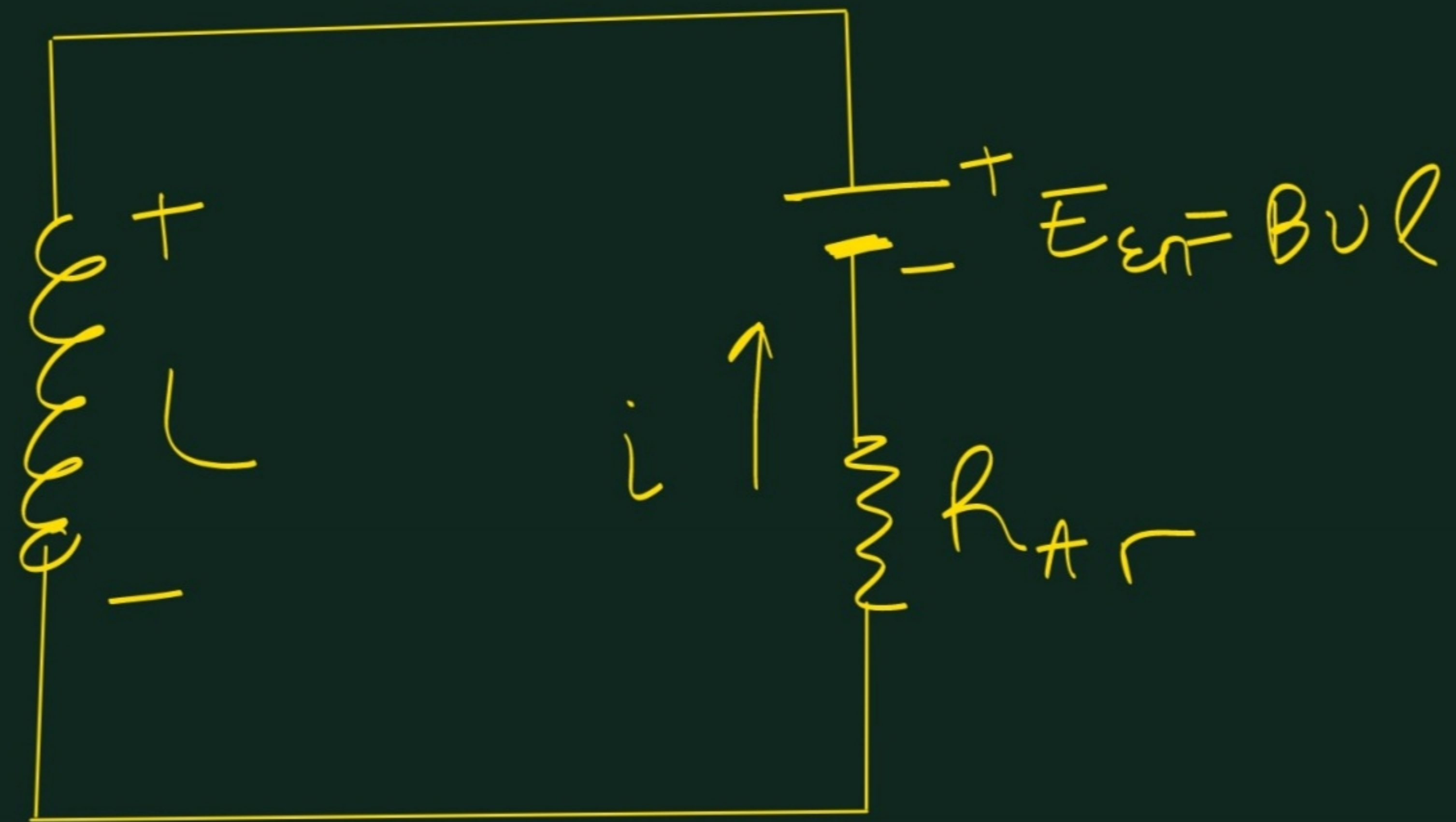


α) Κατ' ανάλυση τυχόν έχουσε:

$$|E_{\text{αυτ}}| = L \frac{|\Delta i|}{\Delta t} = L \frac{|i(t) - i(0)|}{t - 0} = 25 \cdot 10^{-3} \frac{(2t + 3 - (2 \cdot 0 + 3))}{t}$$
$$= 25 \cdot 10^{-3} \cdot 2 = 50 \cdot 10^{-3} = 5 \cdot 10^{-2} \text{ Volt}$$

Άρα: $|E_{\text{αυτ}}| = 0,05 \text{ Volt}$ γε την πολικότητα
που φούνεζα στο σχήμα

β) Έξοδος από συνάρτηση.



$$i(t) = 2t + 3$$

$$\frac{\Delta i}{\Delta t} = \frac{di}{dt} = \frac{i(t) - i(0)}{t - 0} =$$

$$= \frac{2t + 3 - (2 \cdot 0 + 3)}{t - 0} = \frac{2t}{t} = 2 \text{ A/s.}$$

Από το 2^ο κανόνα Kirchhoff (KVL)

$$\text{Έκφραση: } E_{\varepsilon\eta} = i R_{Ar} + V_L \Rightarrow Bu\ell = i(t) \cdot R_{Ar} + |E_{ωτ}| \Rightarrow$$

$$0,1 \cdot v \cdot 0,5 = (2t + 3) \cdot 5 \cdot 10^{-2} + 5 \cdot 10^{-2} \Rightarrow$$

$$v \cdot 5 \cdot 10^{-2} = (2t + 3) \cdot 5 \cdot 10^{-2} + 5 \cdot 10^{-2} \Rightarrow v(t) = 2t + 3 + 1 \Rightarrow v(t) = 2t + 4 \text{ (SI)}$$

$$\gamma) v(t) = 2t + 4 \text{ (SI)}$$

$$\frac{\Delta v}{\Delta t} = \frac{v(t) - v(0)}{t - 0} = \frac{2t + 4 - (2 \cdot 0 + 4)}{t} \Rightarrow$$

$$\frac{\Delta v}{\Delta t} = 2 \text{ m/s}^2$$

δ) Η μινι είναι ομαλά επιταχυνόμενη.

$$F - F_L = ma =$$

$$F - B \cdot l = ma \Rightarrow$$

$$F - 0,1(2t + 3) \cdot 0,5 = 0,15 \cdot 2 \Rightarrow$$

$$\frac{F}{0,1} - \frac{0,1}{1}(2t + 3) \cdot 0,5 = \frac{0,3}{3} \Rightarrow 10F - (2t + 3) \cdot 0,5 = 3 \Rightarrow$$

$$10F = t + 1,5 + 3 \Rightarrow F = 0,1(t + 4,5)$$

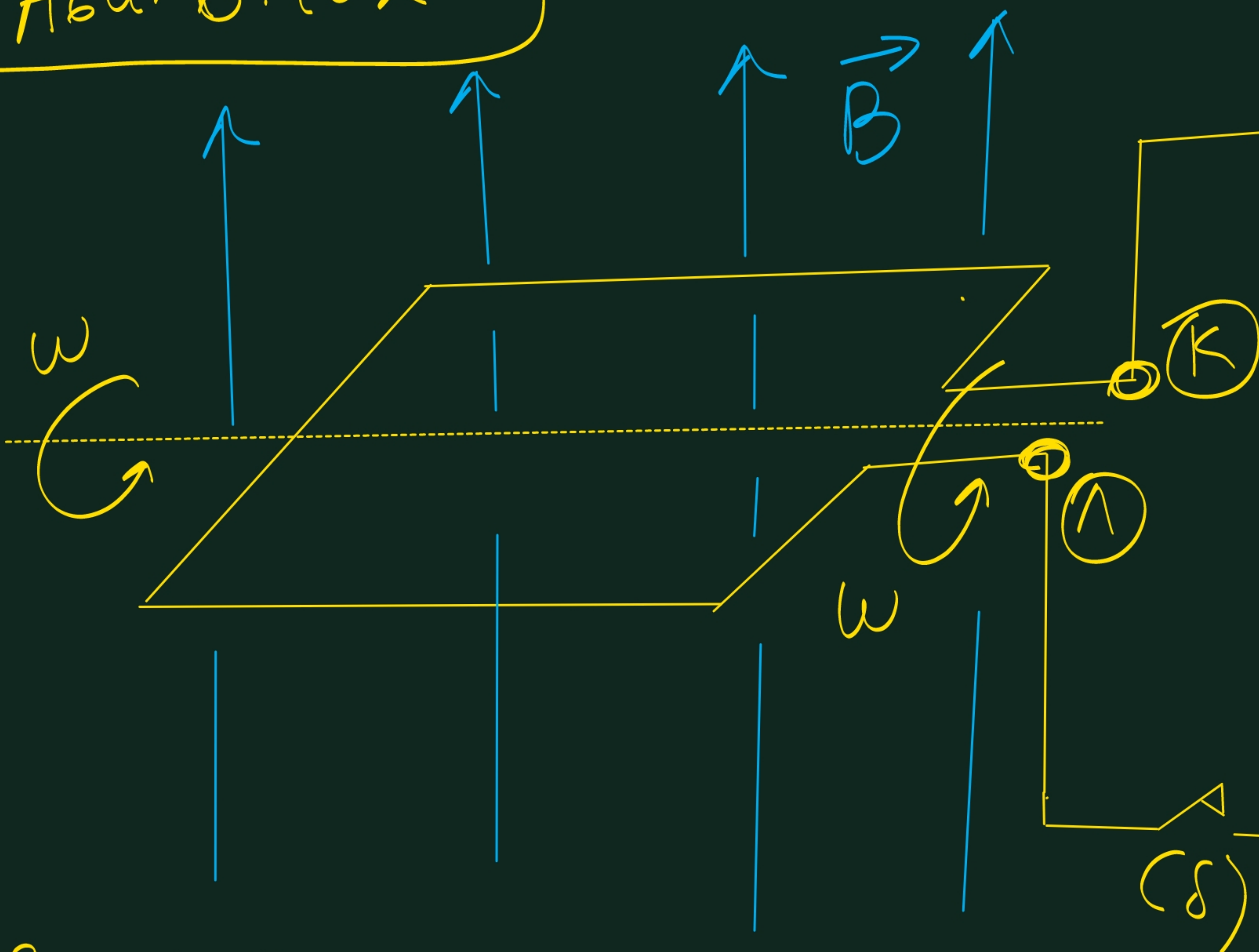
$$P_F = F \cdot v = 0,1(t + 4,5) \cdot (2t + 4) \Rightarrow$$

$$P_F(4) = 0,1 \cdot 8,5 \cdot 12 \Rightarrow$$

$$P_F(4) = 0,1 \cdot 102 \Rightarrow$$

$$P_F = 10,2 \text{ Watt}$$

А64. 6.102.



$$R_n = 4 \Omega$$

$$\omega = 10 \pi \text{ r/s}$$

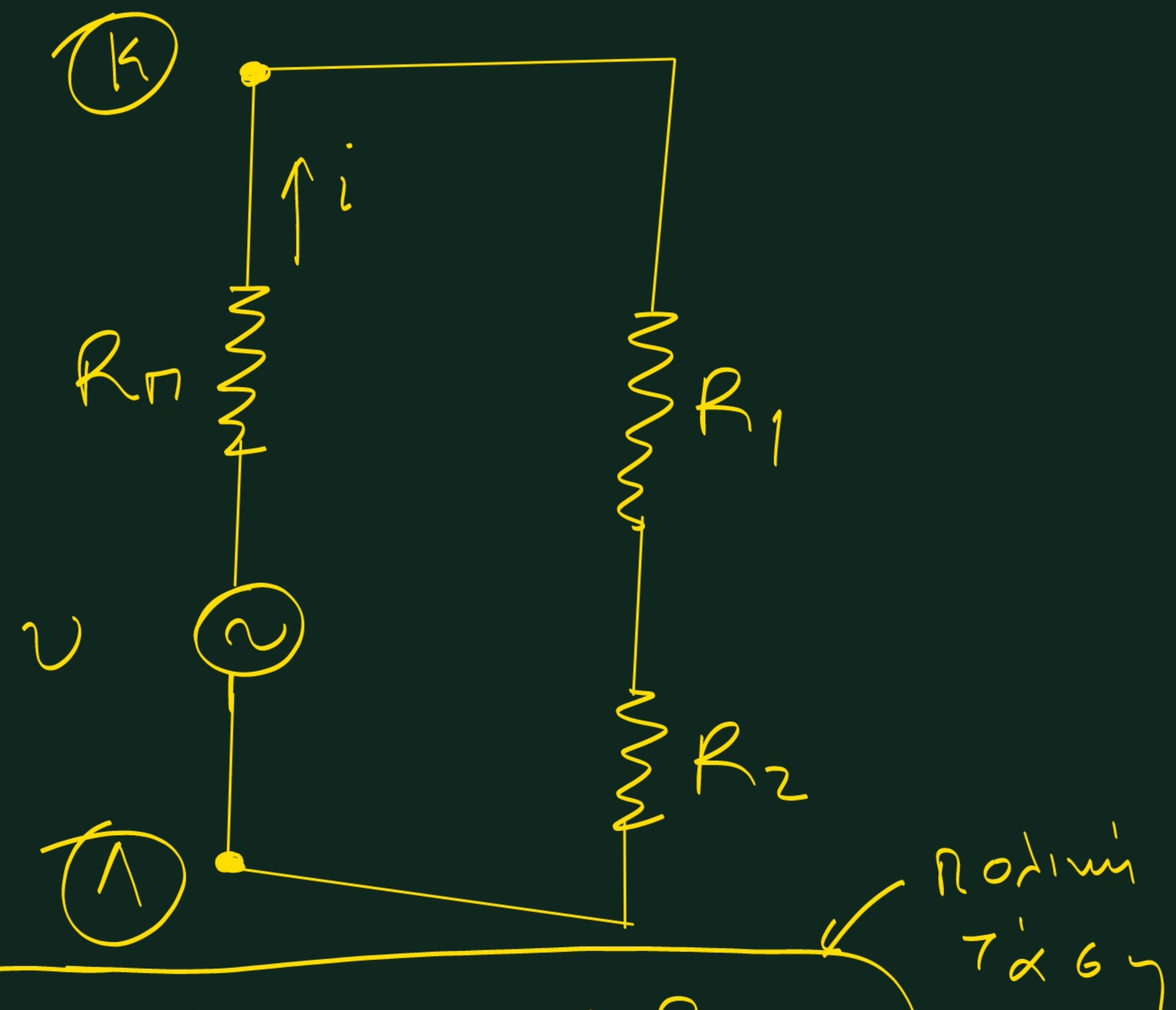
$$V = 30 \text{ Volt}$$

$$V_n = 18 \text{ Volt}$$

$$P_1 = 18 \text{ W}$$

$$R_{\Sigma} = R_n + R_1 + R_2$$

$$(V = N B A \omega)$$



$$V_{KA} = V_n = V - i R_n$$

$$V = V_m \sin \omega t$$

$$i = I_m \sin \omega t$$

$$V_n = V_m \sin \omega t$$

номинал
табл

