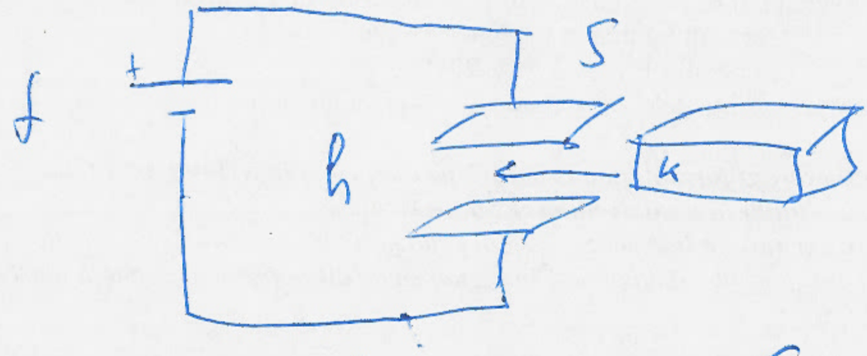
(1)

12 - 9 - 2019

P-1




$$C_0 = \varepsilon \frac{S}{h}$$

$$q_{IN} = C_0 f$$

$$C_{FIN} = \varepsilon_0 k \frac{S}{h} = kC_0$$

$$q_{FIN} = C f$$

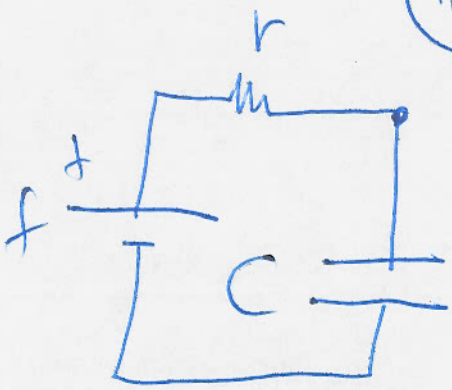
$$q_{FLUSSO} = \Delta q = q_{FIN} - q_{IN} = C f - C_0 f =$$

$$= k C_0 f - C_0 f = C_0 f (k-1)$$

2



INIZ.



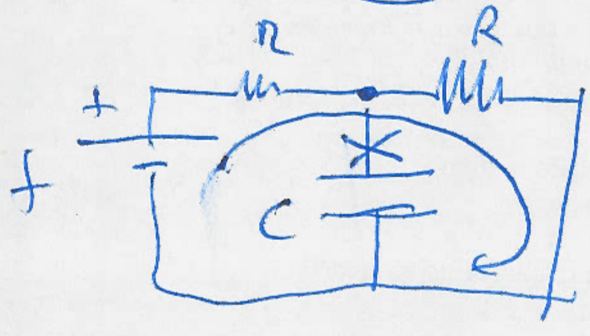

$$E_{erogata} = E_{Resis} + E_C$$
$$= 2E_C$$

$$E_C = \frac{E_{erogata}}{2} = \frac{1}{2} C f^2 \rightarrow C = \frac{E_{erogata}}{f^2}$$

$$E_R = \int_0^{+\infty} P_R \cdot dt = \int_0^{+\infty} R\, i^2\, dt \quad \text{con} \quad i(t) = \frac{f}{R} e^{-\frac{t}{RC}}$$

$$= \int_0^{+\infty} R \frac{f^2}{R^2} e^{-\frac{2t}{RC}} dt = \frac{\cancel{RC} f^2}{\cancel{R} 2} 1 = \frac{1}{2} C f^2$$

FINALE



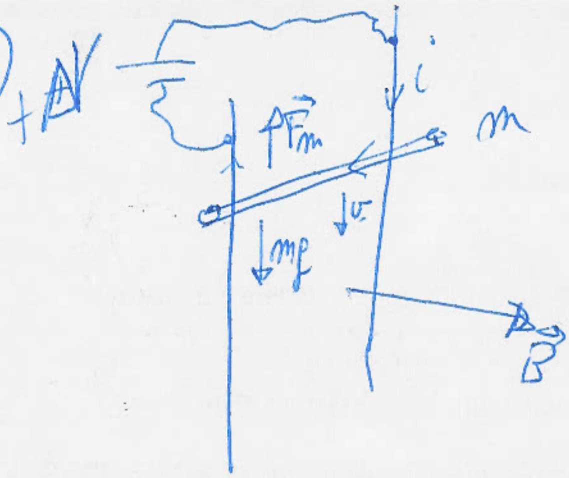

$$i = \frac{f}{R+r} \qquad V_C = Ri$$

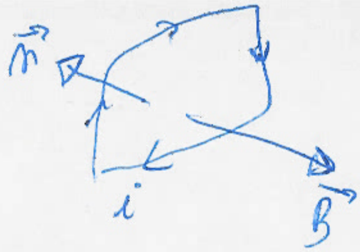
$$V_C = \frac{Rf}{R+r}$$

$$E_{C_f} = \frac{1}{2} C V_C^2$$

$$\Delta E_C = \frac{1}{2} C V_C^2 - \frac{1}{2} C f^2 = \frac{1}{2} C (V_C^2 - f^2)$$

(3)




P-3

INIZ. $\boxed{v=0 \quad \Delta V = V_0}$

$F_m = i b B = mg$ UGUAGLIO I MODULI

$i = mg/bB \Rightarrow V_0 = Ri = Rmg/bB$

FINALE $\Delta V = V_0/2 = \frac{Rmg}{2bB}$

$v_{a\ regime} = v_{cost} = v_\infty \Rightarrow a_{cc}=0 \Rightarrow \sum \vec F = 0 \quad F_m = mg$

per cui ancora $i_\infty bB = mg \to i_\infty = mg/Bb$

ma $i_\infty = \frac{f_{em}}{R} \to f_{em} = i_\infty R = mgR/Bb \equiv V_0$ !

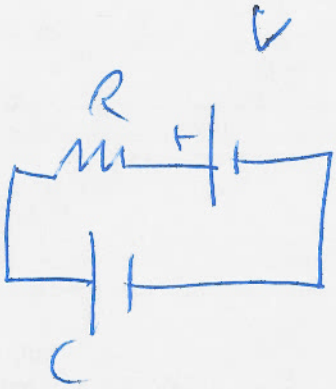
$$f_{em} = \frac{V_0}{2} + \mathcal{E}_i = \frac{V_0}{2} - \frac{d\phi(\vec B)}{dt} = \frac{V_0}{2} + bBv_\infty = V_0$$

$$bBv_\infty = V_0 - \frac{V_0}{2} = \frac{V_0}{2} \qquad v_\infty = \frac{V_0}{2bB} = \frac{Rmg}{2b^2B^2}$$

4

P-4

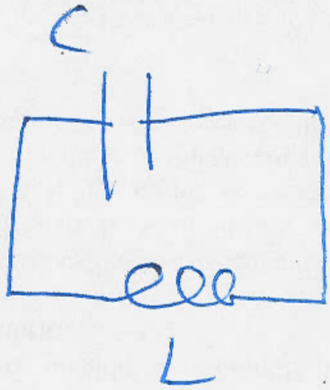
INIT.




a regime $i = 0$

$V_{C_0} = V$

FIN




$\omega = \frac{1}{\sqrt{LC}}$

$$U_{C\,MAX} = \frac{1}{2} C V_{C_0}^2 = U_{L\,MAX} = \frac{1}{2} L i_0^2$$

$$i_0^2 = \frac{C}{L} V_{C_0}^2 = \frac{C}{L} V^2$$

$$i_0 = \sqrt{\frac{C}{L}}\, V$$