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Quiz 2 Fisika 2 (kelas 1)

(1) Dik: $N = 100$ lilitan.
$A = 60 \times 80 = 4800\,cm^2$.
$f = 300$ rpm $= 5$ Hz
$B = 0{,}5\,T$

Dit: a) $\mathcal{E}$?
b) A agar $\mathcal{E} = 150$ V ?

Jawab:

a) $\mathcal{E} = N \cdot B \cdot A \cdot \omega \cdot \sin\theta$

$= 100 \cdot \frac{1}{2} \cdot 4800 \cdot 10^{-4} \cdot 2 \cdot \frac{22}{7} \cdot 5$

$= 754{,}3$ V

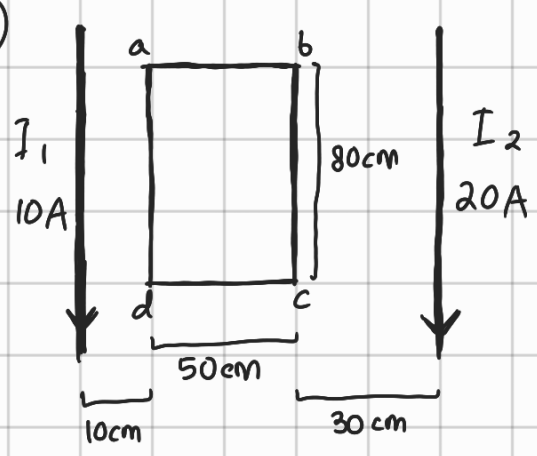
b) $\mathcal{E}' = N \cdot B \cdot A' \cdot \omega$

$150 = 100 \cdot \frac{1}{2} \cdot A' \cdot 2 \cdot \frac{22}{7} \cdot 5$

$21 = 220\,A'$

$A' = 0{,}095\,m^2$.

(2)



Dit: a) Φ abcd akibat I_1?
b) Φ abcd akibat I_2?
c) Φ abcd total?

Jawab:

a) $d\Phi = \frac{\mu_0 i}{2\pi x} l\,dx$

$\Phi = \int_a^b \frac{\mu_0 i l}{2\pi} \frac{dx}{x} = \frac{\mu_0 i l}{2\pi} \ln \frac{x_2}{x_1}$

$\Phi_1 = \frac{4\pi \cdot 10^{-7} \cdot 10 \cdot 80 \cdot 10^{-2}}{2\pi} \ln \frac{60}{10} = 16 \cdot 10^{-7} \ln 6$ Wb

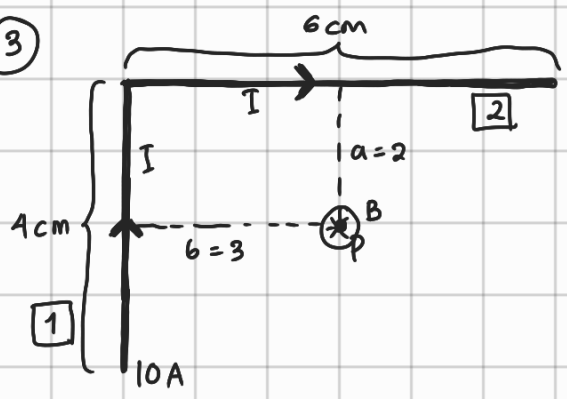
b) $\Phi_2 = \frac{4\pi \cdot 10^{-7} \cdot 10 \cdot 80 \cdot 10^{-2}}{2\pi} \ln \frac{80}{30} = 16 \cdot 10^{-7} \ln \frac{8}{3}$ Wb

c) $\Phi = \Phi_1 - \Phi_2$

$= 16 \cdot 10^{-7} \ln 6 - 16 \cdot 10^{-7} \ln \frac{8}{3}$

$= 16 \cdot 10^{-7} \left(\ln 6 - \ln \frac{8}{3} \right)$ Wb

③



Dit: a) Besar dan arah B di P?

b) q_h ⊕ ke kanan $v = 5 \times 10^4$ m/s, F?

Jawab:

a) Sesuai kaidah tangan kanan,

arah B masuk ke dalam bidang ⊗

* oleh kawat 1 (vertikal)

$$B_1 = \frac{\mu_0 i_1}{2\pi b} = \frac{4\pi \cdot 10^{-7} \cdot 10}{2\pi \cdot 3 \cdot 10^{-2}} = \frac{2}{3} \cdot 10^{-4} \text{ T}$$

* oleh kawat 2 (horizontal)

$$B_2 = \frac{\mu_0 i_2}{2\pi a} = \frac{4\pi \cdot 10^{-7} \cdot 10}{2\pi \cdot 2 \cdot 10^{-2}} = 10^{-4} \text{ T}$$

* Total

$B = B_1 + B_2$

$= 0{,}67 \cdot 10^{-4} + 10^{-4} = 1{,}67 \cdot 10^{-4}$ T

b) $F = q_h v \cdot B \sin\theta$

$= q_h \cdot 5 \cdot 10^4 \cdot 1{,}67 \cdot 10^{-4} \sin 90°$

$= 8{,}35 q_h$ N