No.

Date :

Dida. Paseyo 053 - 019

1.

$I_1 = 5A$

$I_2 = 6A$

$c = 0.1\ m$

$a = 0.15\ m$

$l = 0.40\ m$

1. $F_{21} = F_{AD} = I_2 (AD \times \frac{\mu_0 I_1}{2\pi c} (-\hat{i}))$

$= 10.000 \cdot \frac{2\pi \cdot 10^{-7} \cdot 5}{2\pi \cdot 0.1} (-\hat{i})$

$= 45 \cdot 10^{-6} (-\hat{i})\ N$

2. $F_{21} = F_{BC} = I_2 L_{BC} \times \frac{\mu_0 I_1}{2\pi (a+c)} (\hat{i})$

$= 10 \cdot 0.45 \cdot \frac{2\pi \cdot 10^{-7} \cdot 5}{2\pi (0.25)}$

$= 18 \cdot 10^{-6} (\hat{i})\ N$

$F_{total} = F_{AB} + F_{BC}$

$= -45 \cdot 10^{-6} (\hat{i}) + 18 \cdot 10^{-6} \cdot (\hat{i})$

$= -27 \cdot 10^{-6}\ \hat{i}$ (newton)

$|F| = \sqrt{(27 \cdot 10^{-6})^2}$

$= 27 \cdot 10^{-6}\ N$

3. $F_{21} = F_{AB} = I_2 \int_c^{c+a} dx \cdot \frac{\mu_0 I_1}{2\pi x} (\hat{j})$

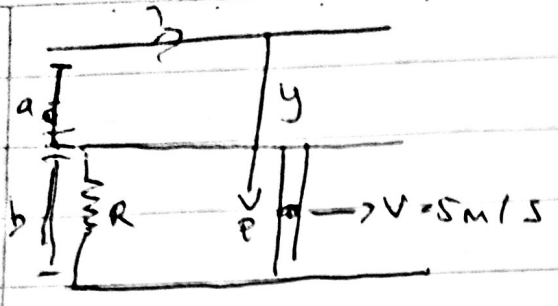
$= I_2 \frac{\mu_0 I_1}{2\pi} \int_c^{c+a} \frac{1}{x} dx (\hat{j})$

$= I_2 \frac{\mu_0 I_1}{2\pi} \ln\left(\frac{c+a}{c}\right) (\hat{j})$

$= 10 \cdot \frac{2 \cdot 4\pi \cdot 10^{-7} \cdot 5}{2\pi} \ln\left(1 + \frac{0.15}{0.1}\right) (\hat{j}) = 28 \cdot 10^{-7} (\hat{j})\ N$

Date :

2.

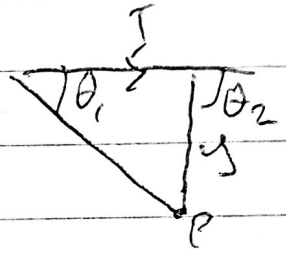


Tida Prasetyo
053 - 019

$a = 1cm \quad b = 19cm$

$V = 5 m/s$

$I = 100 A$



a) $B = \frac{\mu_0 I}{2L} \times \frac{1}{4\pi}$

$B = \frac{\mu_0 I}{4\pi a} (\cos\theta_1 - \cos\theta_2)$

$= \frac{4\pi \cdot 10^{-4} \cdot 100 A}{4\pi \cdot 10,5} (1 - 0)$

$y = 9,5 + 1 = 10,5$

$\theta_1 = 0$

$\theta_2 = 90$

$B = 9,5 \cdot 10^{-7} T$

b) $\mathcal{E} = -BLV$

$= 9,5 \cdot 10^{-7} \cdot 5 \cdot 20$

$= -950 \cdot 10^{-7}$ Volt

c) $I = -\frac{\mathcal{E}}{R}$

$I = \frac{950 \cdot 10^{-7}}{R} A$