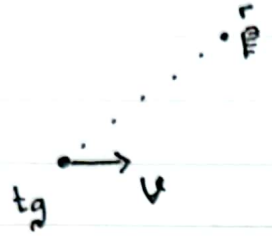
No. Senin, 27/05/2024

Date

Kalisma

MEDAN MAGNET

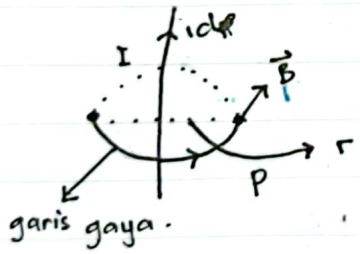
1. Medan magnet oleh muatan bergerak.



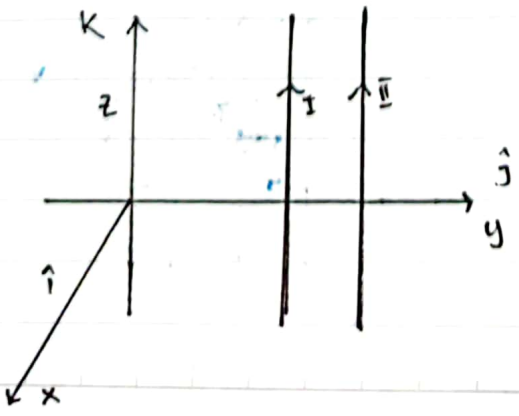
$$\vec{B} = \frac{\mu_0 q v \times \hat{r}}{4\pi \, 4\pi \, r^2}$$

$$= \frac{\mu_0 q v}{4\pi r^2} \sin\theta .$$

2. $\vec{B}$ oleh arus listrik

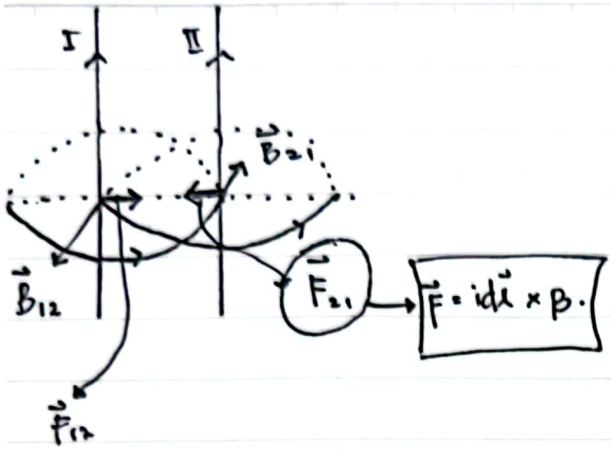


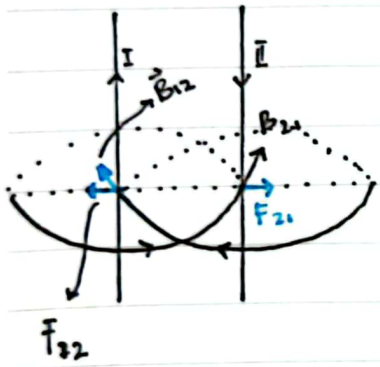
$$\vec{B} = \frac{\mu_0}{4\pi} \frac{Id\vec{l} \times \hat{r}_0}{r^2}$$

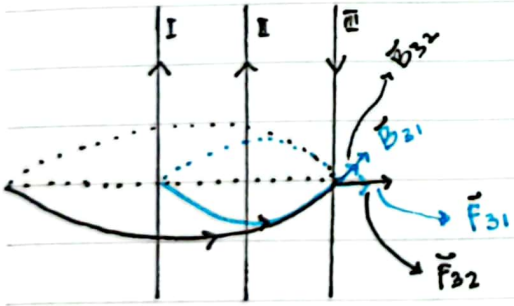


$$\vec{B} = \frac{\mu_0}{4\pi} \frac{Id\vec{l}\hat{k} \times}{r^2}$$

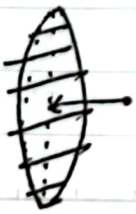
$$= \frac{\mu_0}{4\pi} \frac{Idl}{r^2} \sin\theta \, (-\hat{i})$$

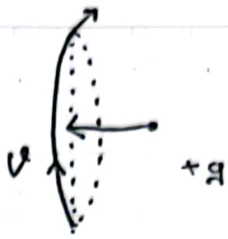


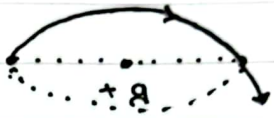


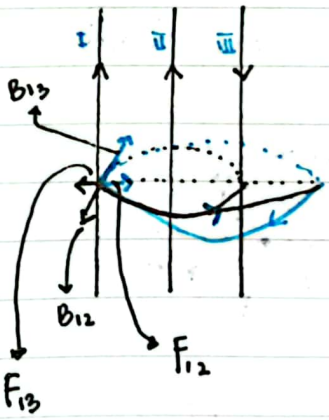


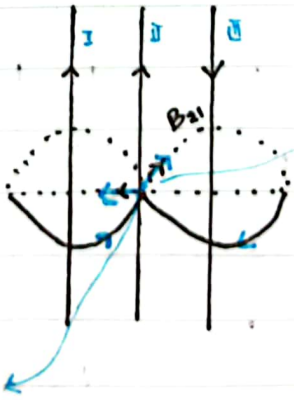
Medan magnet selalu menyinggung garis gaya.











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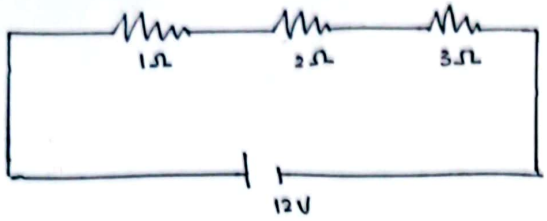
1.



a). Hitung arus pada R_3

b). Hitung tegangan pada R_2.

Jawab:

a). $I_{R_3} = \frac{V}{R_{total}}$

$= \frac{12}{1\Omega + 2\Omega + 3\Omega}$

25

$= \frac{12}{6}$

$= 2\ A.$

b). $V = R.I$

$= 2 \times 6$

$= \frac{12\ V}{3}$

$= 4V$

$\rightarrow I_{R_2} = \frac{V}{R_2}$

$= \frac{12}{6\Omega}$

$= 6\ A$

Jawab:

(a) $R_t = \frac{1}{1} + \frac{1}{2} + \frac{1}{3}$

$= \frac{6+3+2}{6} = \frac{11}{6} = 1.83\ \Omega$

$I_{R_3} = \frac{V}{R}$

15

$= \frac{12}{1.83}$

$= 6.55\ A$

(b). Tegangan R_1, R_2, R_3 } 12 V

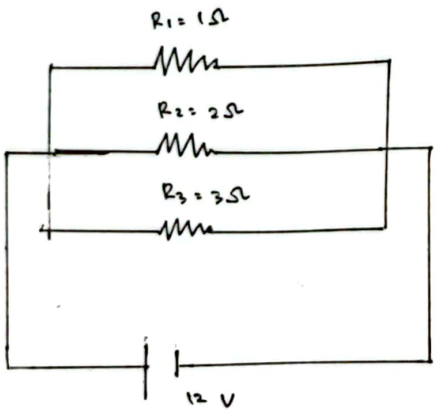
Tegangan R_2

$V_{R_2} = I \times R$

$= 12 \times 1.83$

$= 21.96\ V.$

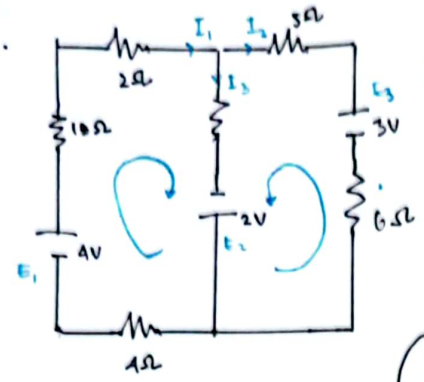
2.



a). Hitung arus pada R_3

b). Hitung tegangan pada R_2

3).



Hitung arus tiap loop (I_1, I_2, I_3)

15

Jawab:

diket:

$E_1 = 4V$ $R_1 = 1\Omega$ $R_5 = 5\Omega$

$E_2 = 2V$ $R_2 = 2\Omega$ $R_6 = 6\Omega$

$E_3 = 3V$ $R_3 = 3\Omega$

$R_4 = 4\Omega$

Loop I_1

$$\sum E + \sum IR = 0$$

$$-\mathcal{E}_1 + \mathcal{E}_2 + I_1(R_1 + R_2 + R_4) + I_3(R_3) = 0$$

$$-4 + 2 + I_1(1 + 2 + 4) + I_3(3) = 0$$

$$-2 + I_1(7) + I_3(3) = 0$$

$$-2 + I_1(10) = 0$$

$$I_1(10) = 2$$

$$I_1 = \frac{2}{10}$$

$$I_1 = 0{,}2\ A.$$

loop I_2

$$\sum \mathcal{E} + \sum IR = 0$$

$$-\mathcal{E}_3 + \mathcal{E}_2 + I_2(R_5 + R_6) + I_3(R_3) = 0$$

$$-3 + 2 + I_2(5 + 6) + I_3(3) = 0$$

$$-1 + I_2(11) + I_3(3) = 0$$

$$-1 + I_2(14) = 0$$

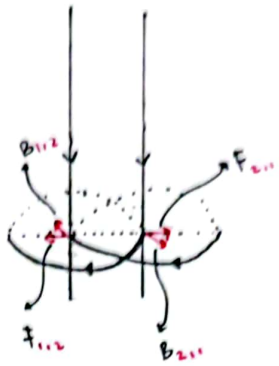
$$I_2(14) = 1$$

$$I_2 = \frac{1}{14}$$

$$I_2 = 0{,}07\ A$$

Arus loop 1 dan 2 adalah 0,2 A dan 0,07 A.

1.



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