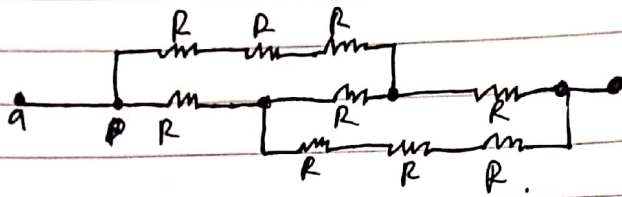


"Ujian akhir Semester"

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1. Perhatikan gambar.



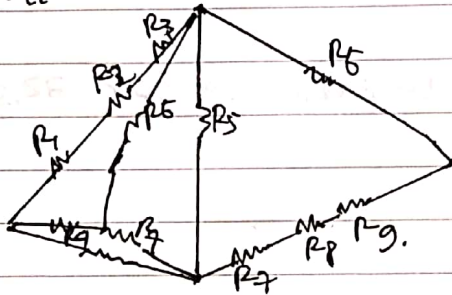
Jika $R = 5 \text{ ohm}$ dan terpasang seperti pada gambar diatas, hitung:

a. Hambatan Pengganti.

b. Jika $V_{ab} = 10 \text{ Volt}$ bagaimana arus pada setiap hambatan pada rangkaian diatas?

- Dik: $R = 5$.

$V_{ab} = 10 \text{ Volt}$.



$$\begin{aligned} a. R_a &= \frac{(R_1 + R_2 + R_3) R_4}{(R_1 + R_2 + R_3) + R_4 + R_5} \\ &= \frac{(5 + 5 + 5) 5}{(5 + 5 + 5) + 5 + 5} \\ &= \frac{75}{25} = 3 \text{ ohm.} \end{aligned}$$

$$\begin{aligned} R_b &= \frac{(R_1 + R_2 + R_3) \cdot R_1}{(R_1 + R_2 + R_3) + R_4 + R_5} \\ &= \frac{(5 + 5 + 5) \cdot 5}{(5 + 5 + 5) + 5 + 5} \\ &= \frac{75}{25} = 3 \text{ ohm.} \end{aligned}$$

$$\begin{aligned} R_c &= \frac{R_4 \cdot R_5}{(R_1 + R_2 + R_3) + R_4 + R_5} \\ &= \frac{5 \cdot 5}{(5 + 5 + 5) + 5 + 5} \\ &= \frac{25}{25} = 1 \Omega. \end{aligned}$$

Jadi hambatan total / hambatan pengganti adalah.

$$\begin{aligned} R_{total} &= R_a + R_p \\ &= 3 + \frac{10}{3} \end{aligned}$$

$$\bullet R_{b5} = R_b + R_5 = 3 + 5 = 8 \text{ ohm.}$$

$$\bullet R_{c789} = R_c + R_7 + R_8 = 1 + 5 = 6 \text{ ohm.}$$

$$R_{total} = \frac{25}{3} \Omega.$$

$$R_{total} = 8,3 \Omega.$$

$$\bullet \frac{1}{R_p} = \frac{1}{R_{b5}} + \frac{1}{R_{c789}}$$

$$= \frac{1}{8} + \frac{1}{16}$$

$$= \frac{2+1}{16}$$

$$\frac{1}{R_p} = \frac{3}{16} \quad R_p = \frac{16}{3}$$

②. $I = \frac{V}{R_{\text{tot}}}$

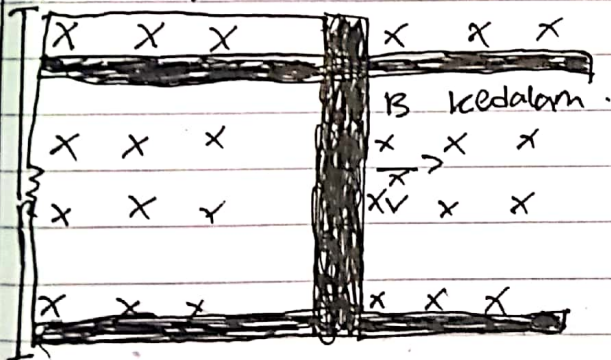
Plot

$$= \frac{10}{8,3} = 1,2 \text{ A.}$$

2. perhatikan gambar rangkaian multisimpal dibawah ini, bagaimana arus mengalir pada setiap simpal?

$$dx = v dt.$$

$$I \leftarrow x \rightarrow$$



Jelaskan bagaimana arus bisa mengalir pada kumparan?

Gambarkan arah arus pada kumparan tersebut! jika medan magnet 20 Tesla, kecepatan gerakan kawat 10 m/s jauh gerakan kawat 10 m/s, jauh gerakan kawat <1> = 15 m, dan hambatan yg terpasang 10 ohm. berapa besarnya arus dalam terpasang kumparan tersebut?

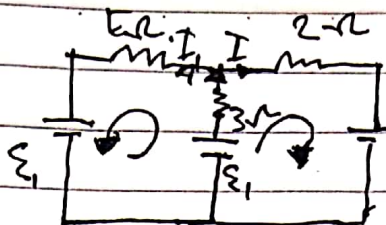


③ · Dik:

$$R_1 = 6 \Omega$$

$$R_2 = 2 \Omega$$

$$R_3 = 3 \Omega$$



Penyelesaian

Hk. kirchof I

$$\sum I_{\text{masuk}} = \sum I_{\text{keluar}}$$

$$I_3 = I_1 + I_2$$

Hk. Kirchof II

$$\text{loop I } \sum \mathcal{E} + \sum IR = 0$$

$$\mathcal{E}_1 - \mathcal{E}_2 + I_1 \cdot 6 + I_3 \cdot 3 = 0$$

$$6 - 12 + 6I_1 + 3(I_1 + I_2) = 0$$

$$-6 + 6I_1 + 3I_1 + 3I_2 = 0$$

$$9I_1 + 3I_2 = 6 \quad (I)$$

$$\text{loop II } \sum \mathcal{E} + \sum IR = 0$$

$$\mathcal{E}_2 - \mathcal{E}_1 + I_2 \cdot 2 + I_3 \cdot 3 = 0$$

$$-12 + 2I_2 + 3(I_1 + I_2) = 0$$

$$-4 + 2I_2 + 3I_1 + 3I_2 = 0$$

$$3I_1 + 5I_2 = 4 \quad (II)$$

$$9I_1 + 3I_2 = 6 \quad \times 1$$

$$3I_1 + 5I_2 = 4 \quad \times 3$$

$$9I_1 + 3I_2 = 6$$

$$9I_1 + 15I_2 = 12$$

$$-12I_2 = -6$$

$$I_2 = 0,5 \text{ A}$$

$$\text{Pada } R_2 = 2 \Omega$$

$$3I_1 + 5I_2 = 4$$

$$3I_1 + 5(0,5) = 4$$

$$3I_1 + 2,5 = 4$$

$$3I_1 = 4 - 2,5$$

$$3I_1 = 1,5$$

$$I_1 = 0,5 \text{ A}$$

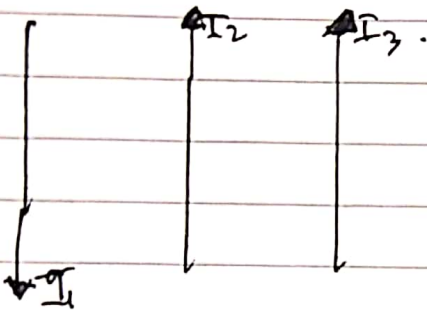
$$\text{Pada } R_1 = 6 \Omega$$

$$R_3 = I_1 + I_2$$

$$= 0,5 + 0,5$$

$$= 1 \text{ A pada } R_3 = 3 \Omega$$

9. Gambar gaya² yang dialami oleh masing² kawat .
Sama besar . kemana arah gerakan kawat 1, 2 dan 3?



Jawab:

