

Pertemuan 10

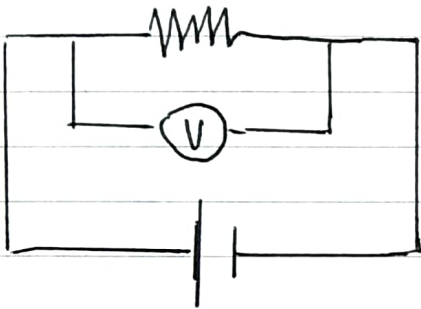
Elektrodinamika

Tugas Praktikum secara berkelompok

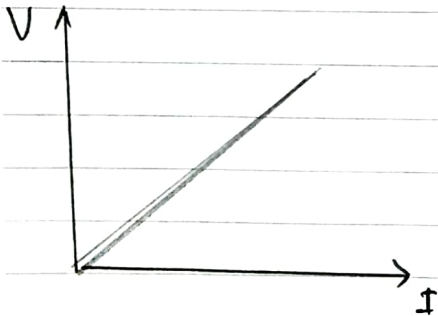
1. Lampu LED yg tidak dipakai
2. Korek api.

Pada Elektrodinamika terdapat :

1. Hukum ohm
2. Rangkaian listrik

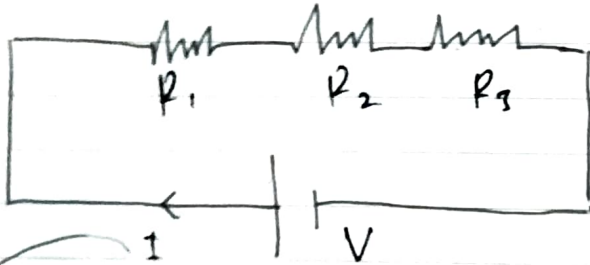


$$V = I \cdot R \text{ (Hubungan antara } V, I, \text{ dan } R.)$$



Hubungan V dan I dan R (tetap) pada hukum ohm.

1) Rangkaian listrik seri.



jika lampu disusun sama, maka hambatannya sama. pada Rangkaian Seri dimana:

$$I_{R1} = \frac{V}{(R_1 + R_2 + R_3)}$$

$$I_{R2} = \frac{V}{(R_1 + R_2 + R_3)}$$

$$I_{R3} = R_{\text{total}}$$

Pada Rangkaian Seri ~~Arus~~ akan bernilai sama yaitu R_{total} .

Pada tegangan R_1 yaitu: $V_{R1} = I \cdot R_1$

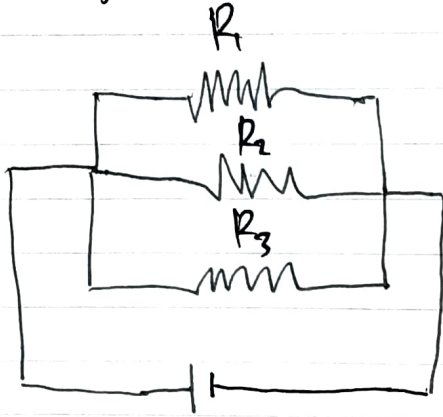
$$V_{R1} = \frac{V}{(R_1 + R_2 + R_3)} \cdot R_1$$

dimana pada Rangkaian Seri :

$$I = \frac{V}{R_1 + R_2 + R_3}$$

$$I = R_1 + R_2 + R_3$$

b.) Rangkaian Paralel (tegangan di R_1, R_2, R_3 sama dengan sumber)



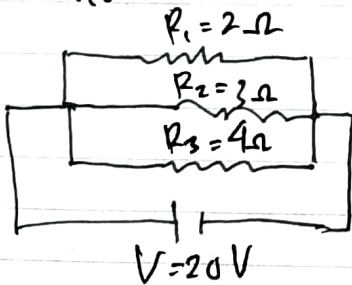
$$V_{R_1} = V_{R_2} = V_{R_3} = V$$

$$I_{R_1} = \frac{V}{R_1} \quad I_{R_2} = \frac{V}{R_2} \quad I_{R_3} = \frac{V}{R_3}$$

$$I = \frac{V}{R_t}$$

$$\frac{1}{R_t} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

Contoh =



ditanya: 1.) R_{total} 2.) Arus R_1 3.) Arus R_2

Penyelesaian:

$$\begin{aligned} 1.) \frac{1}{R_t} &= \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \\ &= \frac{6}{12} + \frac{4}{12} + \frac{3}{12} \\ &= \frac{13}{12} = \frac{12}{13} \end{aligned}$$

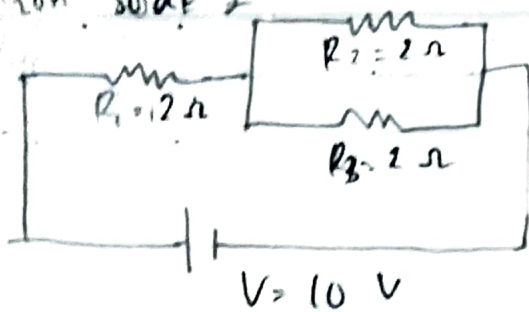
$$I = \frac{V}{R_t} \Rightarrow I = \frac{\frac{20}{\frac{12}{13}}}{\frac{12}{13}}$$

$$= 21,78 \Omega$$

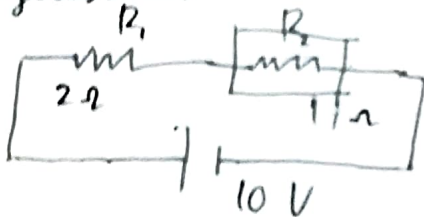
$$2.) I_{R_1} = \frac{V}{R_1} = \frac{20}{2} = 10$$

$$3.) I_{R_2} = \frac{V}{R_2} = \frac{20}{3} = 6,6$$

Contoh soal 2



Pemecahan:



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

$$\frac{1}{R_p} = \frac{2}{2}$$

$$R_p = 1 \Omega$$

$$I = \frac{10}{3} = 3.3 \text{ A}$$

$$R_t = R_1 + R_p = 2 + 1 = 3 \Omega$$

$$I_t = \frac{V}{R_t} = \frac{10}{3} = 3.33 \text{ A}$$

$$I_{R_1} = 3.33 \text{ A}$$

$$I_{R_p} = 3.33 \rightarrow V_{R_p} = R_p \cdot I$$

$$= 1.33$$

$$= 3.3 \text{ Volt}$$

$$I_{R_2} = I_{R_3} = \frac{V_{R_p}}{R_2}$$

$$= \frac{3.33}{2}$$

maka $I_2 = I_3$ Lebih terang dibanding-
kan I_1 lebih redup.