

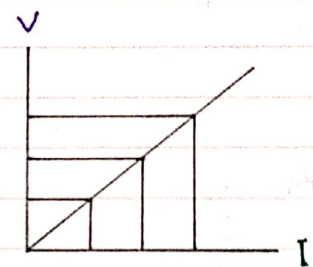
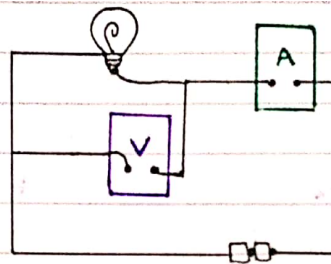
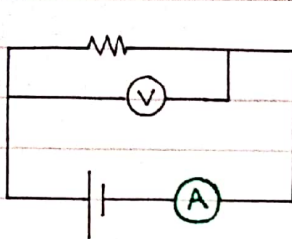
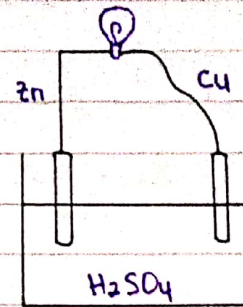
"Elektrodinamika"

1. Hukum Ohm
2. Rangkaian Listrik

Pembahasan :

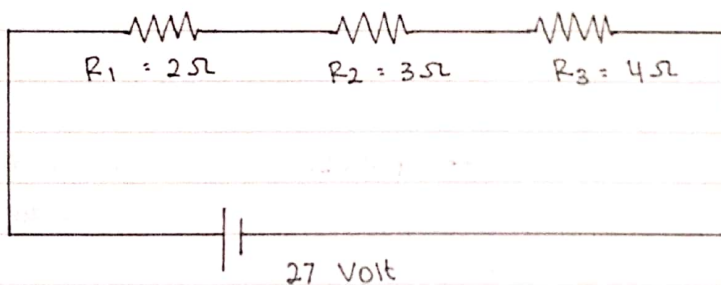
$$J = \frac{\delta E}{AC}$$

$$\rightarrow V = IR$$



$$V = I \cdot R$$

* Seri



$$R_t = R_1 + R_2 + R_3$$

$$= 2\Omega + 3\Omega + 4\Omega$$

$$= 9\Omega$$

$$I = \frac{V}{R} = \frac{27}{9} = 3A$$

$$R_1 \rightarrow I = 3A$$

$$R_2 \rightarrow I = 3A$$

$$R_3 \rightarrow I = 3A$$

$$V = I \cdot R$$

$$V = I \cdot R_1$$

$$= 3A \cdot 2\Omega$$

$$= 6 \text{ Volt}$$

$$V = I \cdot R_2$$

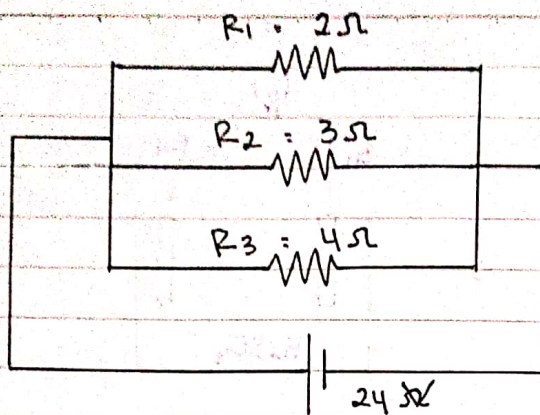
$$= 3A \cdot 3\Omega$$

$$= 9 \text{ Volt}$$

$$V = I \cdot R_3$$

$$= 3A \cdot 4\Omega = 12 \text{ Volt}$$

+ Paralel



$$R_t = \frac{1}{\frac{1}{R_t}} = \frac{1}{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}}$$

$$= \frac{12 + 8 + 6}{24}$$

$$= \frac{26}{24}$$

$$R_t = \frac{13}{12} \Omega$$

$$I = \frac{V}{R} \rightarrow I = \frac{24}{\frac{13}{12}} = 26 \text{ A}$$

+ R₁

$$I = \frac{V}{R_1}$$

$$= \frac{24 \text{ V}}{2 \Omega}$$

$$= 12 \text{ A}$$

$$V = 24 \text{ Volt}$$

+ R₂

$$I = \frac{V}{R_2}$$

$$= \frac{24 \text{ V}}{3 \Omega}$$

$$= 8 \text{ A}$$

$$V = 24 \text{ Volt}$$

+ R₃

$$I = \frac{V}{R_3}$$

$$= \frac{24 \text{ V}}{4 \Omega}$$

$$= 6 \text{ A}$$

$$V = 24 \text{ Volt}$$

→ Seri : - arus sama
- tegangan berbeda

→ Paralel : - arus berbeda
- tegangan sama

+ Daya ($P = \frac{V^2}{R}$)

+ R₁

$$P = \frac{V^2}{R_1}$$

$$= \frac{(24 \text{ V})^2}{2}$$

$$= 288 \text{ W}$$

+ R₂

$$P = \frac{V^2}{R_2}$$

$$= \frac{(24 \text{ V})^2}{3 \Omega}$$

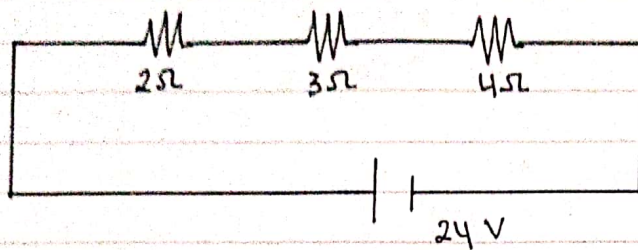
$$= 192 \text{ W}$$

+ R₃

$$P = \frac{V^2}{R_3}$$

$$= \frac{(24 \text{ V})^2}{4 \Omega}$$

$$= 144 \text{ W}$$



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

$$= \frac{24V}{9\Omega}$$

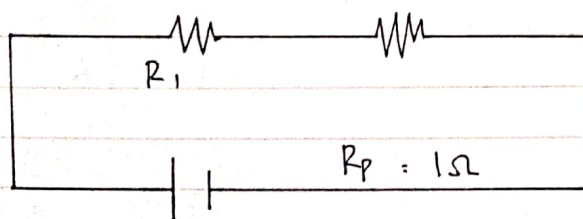
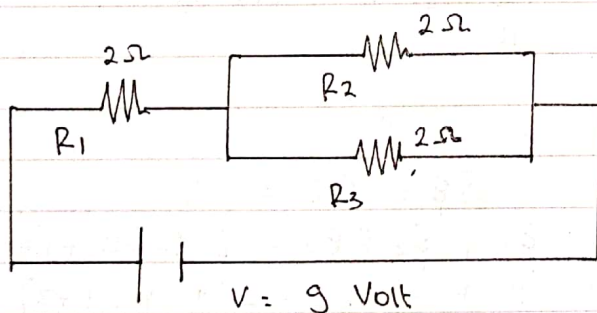
$$I = 2,67 \text{ A}$$

$\dagger R_1 \rightarrow I = 2,67 \text{ A}$	$V = I \cdot R_1$ $= 2,67 \text{ A} \cdot 2\Omega$ $V = 5,34 \text{ Volt}$	$P = I^2 \cdot R_1$ $= (2,67)^2 \cdot 2\Omega$ $P = 14,25 \text{ W}$
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$\dagger R_2 \rightarrow I = 2,67 \text{ A}$	$V = I \cdot R_2$ $= 2,67 \text{ A} \cdot 3\Omega$ $V = 8,01 \text{ Volt}$	$P = I^2 \cdot R_2$ $= (2,67)^2 \cdot 3\Omega$ $P = 21,38 \text{ W}$
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$\dagger R_3 \rightarrow I = 2,67 \text{ A}$	$V = I \cdot R_3$ $= 2,67 \text{ A} \cdot 4\Omega$ $V = 10,68 \text{ Volt}$	$P = I^2 \cdot R_3$ $= (2,67 \text{ A})^2 \cdot 4\Omega$ $P = 28,51 \text{ W}$
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$\dagger$ Campuran



• Paralel

$$R_p = \frac{1}{\left(\left(\frac{1}{R_2}\right) + \left(\frac{1}{R_3}\right)\right)}$$

$$= \frac{1}{\left(\left(\frac{1}{2}\right) + \left(\frac{1}{2}\right)\right)}$$

$$R_p = 1 \Omega$$

• Seri

$$R_t = R_1 + R_p$$

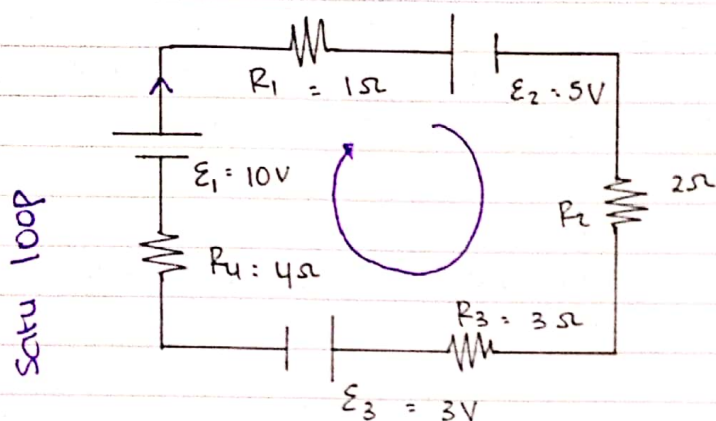
$$= 2\Omega + 1\Omega$$

$$R_t = 3\Omega$$

$$\begin{aligned} \text{+ } R_1 &\rightarrow V = I \cdot R_1 \\ &= 3 \text{ A} \cdot 2 \Omega \\ V &= 6 \text{ Volt} \end{aligned}$$

$$\begin{aligned} \text{+ } R_2 &\rightarrow V = I \cdot R_2 \\ &= 3 \text{ A} \cdot 1 \Omega \\ V &= 3 \text{ Volt} \end{aligned}$$

$$\begin{aligned} \text{+ } R_3 &\rightarrow R_3 = R_2 \\ V &= 3 \text{ Volt} \end{aligned}$$



$$\mathcal{E}_1 > \mathcal{E}_2 > \mathcal{E}_3$$

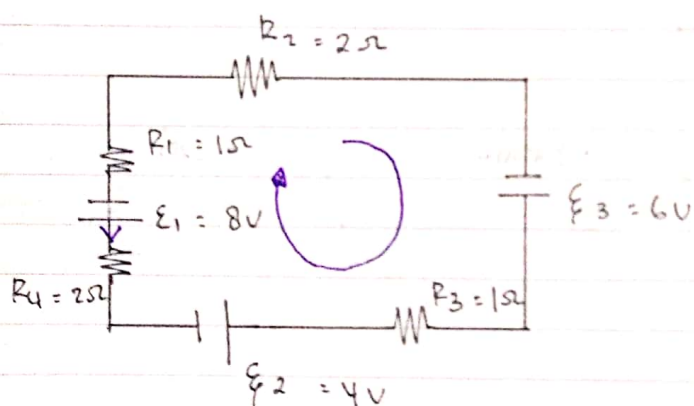
- 1.) Gambar arah arus sesuai dengan besarnya $\mathcal{E}$
- 2.) Gambar loop (searah arus).
- 3.) Jika arah arus searah dengan loop, maka +

$$\sum \mathcal{E} + \sum I \cdot R = 0$$

$$-\mathcal{E}_1 + \mathcal{E}_2 + \mathcal{E}_3 + I(R_1 + R_2 + R_3) = 0$$

$$-10 + 5 + 3 + I(1 + 2 + 3 + 4) = 0$$

$$(-2) + I(10) = \frac{-2}{10} = \frac{-1}{5} = -0,2 \text{ A}$$



$$\sum \mathcal{E} + \sum I \cdot R = 0$$

$$\mathcal{E}_1 + \mathcal{E}_2 + \mathcal{E}_3 - I(R_1 + R_2 + R_3 + R_4) = 0$$

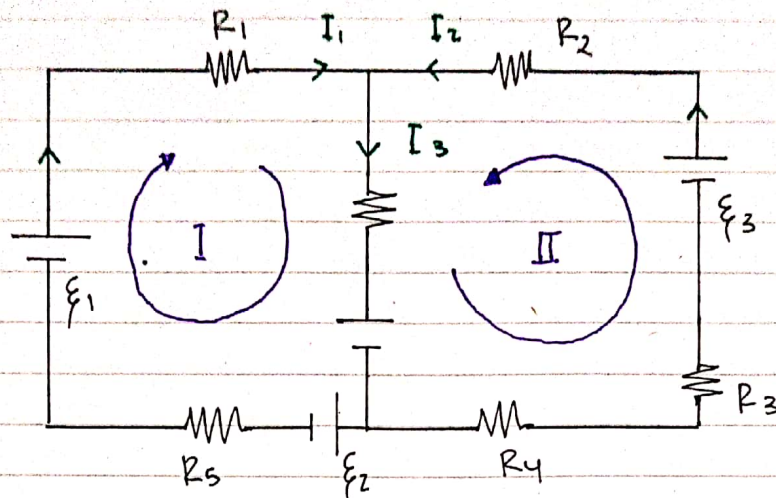
$$8 + 4 - 6 - I(1 + 2 + 1 + 2) = 0$$

$$6 - I(6) = 0$$

$$I = \frac{6}{6}$$

$$I = 1 \text{ A}$$

• 2 LOOP



$$+ \text{loop I} \rightarrow \sum \epsilon + \sum I \cdot R = 0$$

$$- \epsilon_1 + \epsilon_4 + \epsilon_2 + I (R_1 + R_5) + I_3 R_6 = 0$$

$$+ \text{loop II} \rightarrow \sum \epsilon + \sum I \cdot R = 0$$

$$- \epsilon_3 + \epsilon_4 + I_2 (R_2 + R_3 + R_4) + I_3 R_6 = 0$$