

ARUS LISTRIK

Elektrodinamika

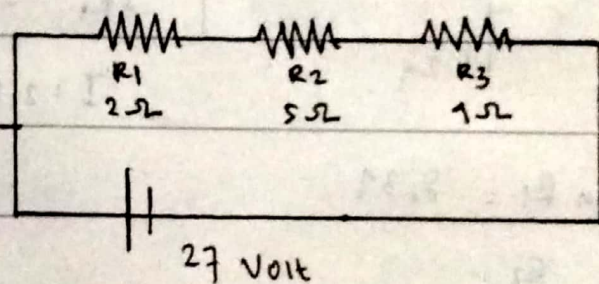
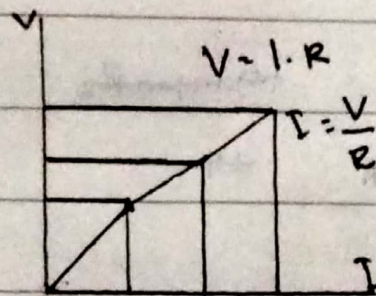
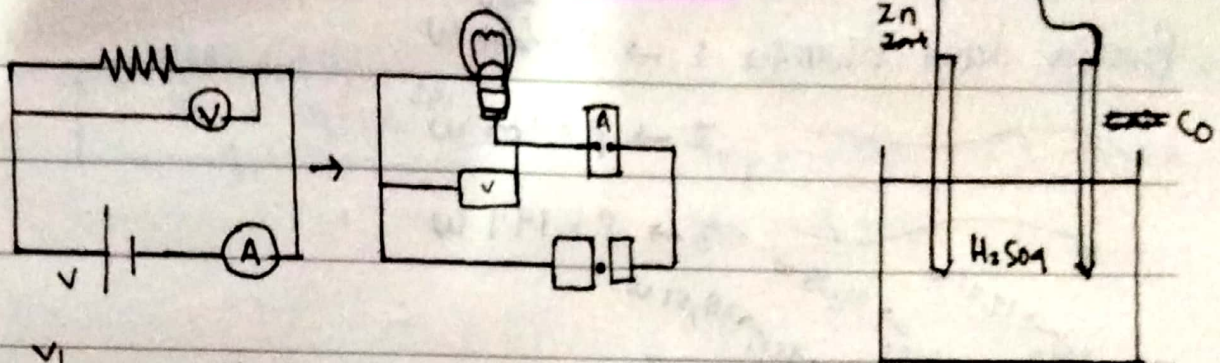
1. Hukum ohm

2. Rangkaian listrik

$$J = \sigma E$$

DC
AC

$$V = IR$$



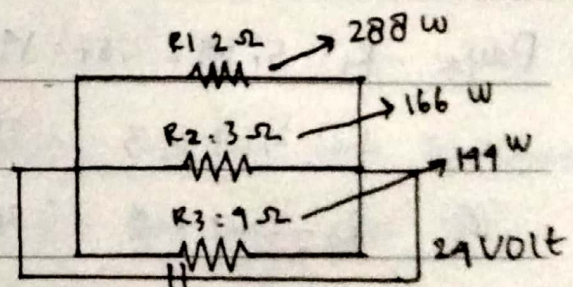
$$R_{total} = 9\Omega$$

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

$$R_1 = 2\Omega$$

$$R_2 = 5\Omega$$

$$R_3 = 1\Omega$$



$$\text{tegangan } R_1 = 24/2 = 12$$

$$R_2 = 24/3 = 8$$

$$R_3 = 24/4 = 6$$

$$\text{Arus} : 26 \rightarrow 12 + 8 + 6 = 26$$

NOTEBOOK

No. Date:

$$R_{\text{total}} = \frac{1}{R_L} \rightarrow \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \quad I = \frac{V}{R}$$

$$\frac{1}{R_L} \rightarrow \frac{12 + 8 + 6}{24} \quad = \frac{24}{12}$$

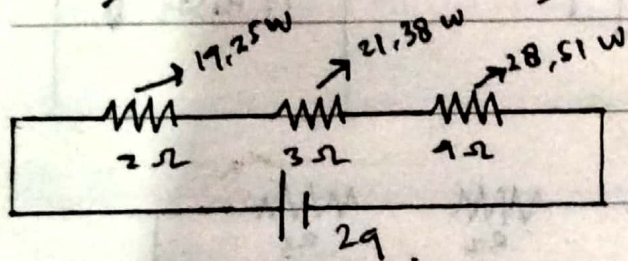
$$\frac{1}{R_L} \rightarrow \frac{26}{24}$$

$$R = \frac{12}{13} \quad = 26 \text{ A}$$

Berapa daya dilampu 1 $\rightarrow P = 19,25 \text{ W}$

$$2 \rightarrow P = 21,38 \text{ W}$$

$$3 \rightarrow P = 28,51 \text{ W}$$



$$I_{R_1} = \frac{24}{9} \quad \text{tegangan } R_2$$

$$I = 2,67 \text{ A} \quad 24$$

$$\text{tegangan } R_1 = 5,31$$

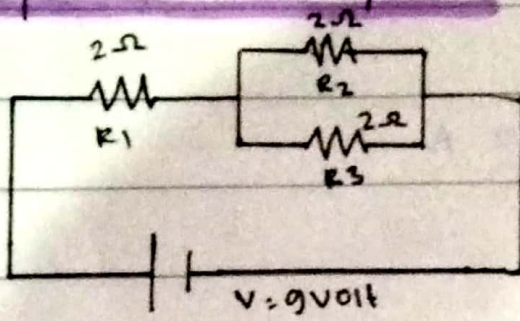
$$R_2 :$$

$$\text{Daya } R_1 = 5,31 \times 2,67 = 14,25 \text{ W}$$

$$R_2 = 2,67 \times 3 = 21,38 \text{ W}$$

$$R_3 = 2,67 \times 1 = 28,51 \text{ W}$$

Campuran Seri dan Paralel

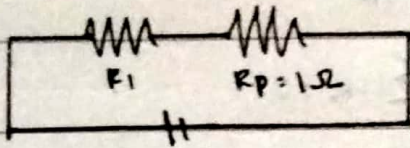


$$R_t = 3\Omega$$

$$I = 3\text{ A}$$

Tegangan $R_p = 3$ $R_1 = 3$ $R_2 = 3$

Arus $R_1 = 3$ $R_2 = 1,5$ $R_3 = 1,5$



$$V_{Rp} = I \cdot R_p \rightarrow 3 \cdot 1 = 3\text{ Volt}$$

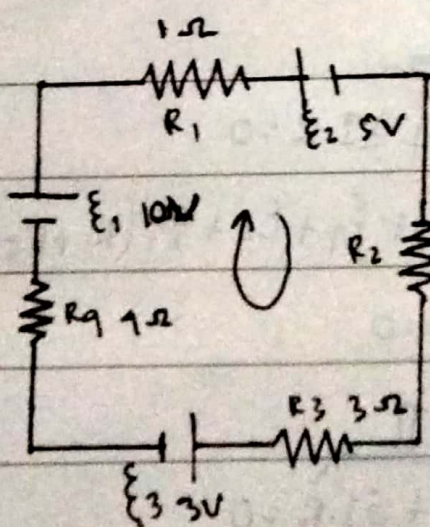
$$V_{R2} = 3\text{ Volt}$$

$$V_{R3} = 3\text{ Volt}$$

$$\text{Arus } R_1 = 3, R_2 = 1,5, R_3 = 1,5$$

Rangkaian Komplek

Hukum Kirchoof



$$E_1 > E_2 > E_3$$

1. gambar asal arus sesuai dgn besarnya E

2. gambar loop sesuka hati ♡

3. jika asal arus searah dgn arah loop maka +

$$\sum E + \sum i \cdot R = 0$$

$$E_1 + E_2 + E_3 + I(R_1 + R_2 + R_3) = 0$$

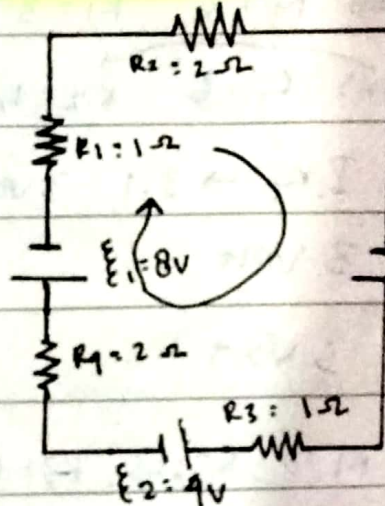
No. Date:

$$\text{Arus } I = 10 \rightarrow -10 + 8 + 3$$

$$= -2$$

$$I = 10' = \frac{2}{10} = \frac{1}{5} = 0,2 \text{ A}$$

Contoh 1 loop



$$\text{Arus : } 1 \text{ A}$$

$$\sum E + \sum I \cdot R = 0$$

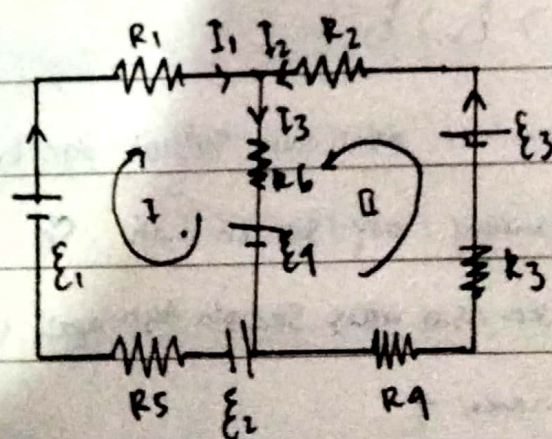
$$E_1 + E_2 - E_3 - I(R_1 + R_2 + R_3) = 0$$

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

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

$$I = \frac{6}{6} = 1 \text{ A}$$

Contoh 2 loop



loop I

$$\sum E + \sum I \cdot R = 0$$

$$-E_1 + E_2 + E_3 + I_1(R_1 + R_5) + I_3 R_6 = 0$$

$$R_6 = 0$$

loop II

$$\sum E + \sum I \cdot R = 0$$

$$-E_3 + E_2 + I_2(R_2 + R_3 + R_4) + I_3 R_6 = 0$$

$$R_6 = 0$$