

Kuliah. Pert. 10.

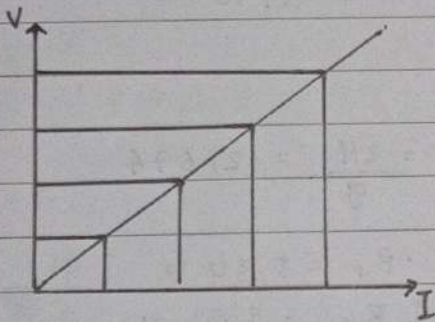
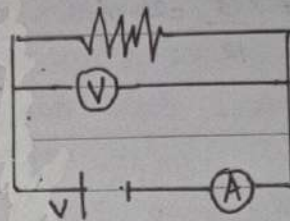
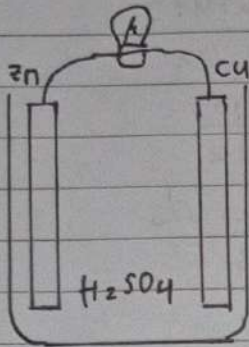
Elektrodinamika.

1. Hukum Ohm
2. Rangkaian listrik

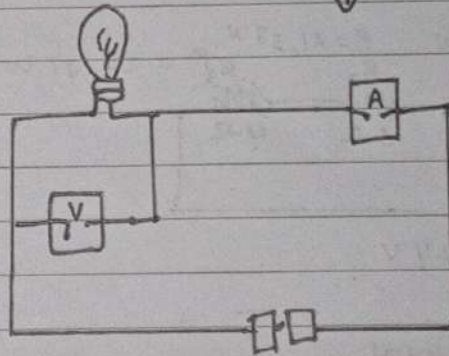
Pembahasan:

1) $J = \sigma E \leftarrow PC$

$V = IR \leftarrow AC$

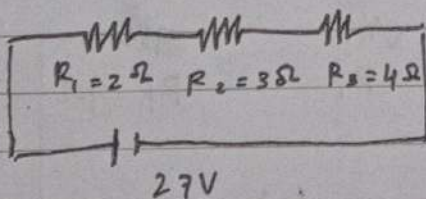


$V = I \cdot R$



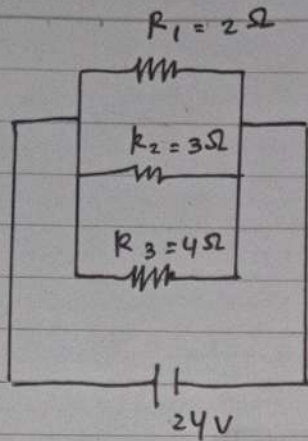
$$2) \quad V_1 = 6V \quad V_2 = 9V \quad V_3 = 12V$$

$$I_1 = 3A \quad I_2 = 3A \quad I_3 = 3A$$



$R_t = 9\Omega$

$I_{total} = \frac{27}{9} = 3A$



$$V_{d1} \cdot R_1, R_2, R_3 = 24V$$

$$I_1 = 12A$$

$$I_2 = 8A$$

$$I_3 = 6A$$

$$I_{total} = 26A$$

$$R_{total} \Rightarrow \frac{1}{R_{tt1}} = \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$$

$$\frac{1}{R} = \frac{6+4+3}{12}$$

$$\frac{1}{R} = \frac{13}{12}$$

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

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

$$= \frac{24}{12/13} = 24 \times \frac{13}{12} = 26A$$

$$P_1 = V \cdot I$$

$$= 24 \cdot 12$$

$$= 288W$$

$$P_2 = V \cdot I$$

$$= 24 \cdot 8$$

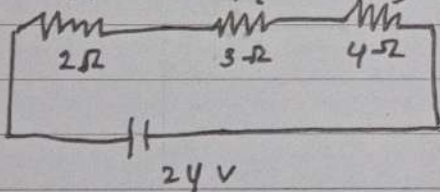
$$= 192W$$

$$> P_3 = V \cdot I$$

$$= 24 \cdot 6$$

$$= 144W$$

$$P = 14,25W \quad P = 21,38W \quad P = 28,51W$$



$$I_{123} = \frac{24}{9} = 2,67A$$

$$V_1 = I \cdot R_1 = 5,34V$$

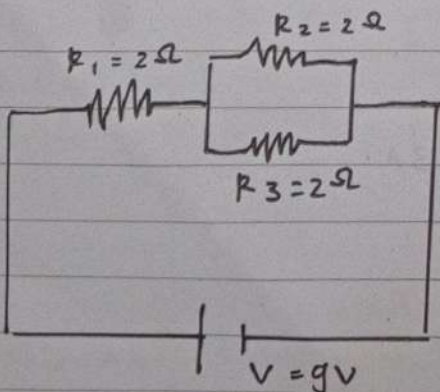
$$V_2 = I \cdot R_2 = 8,01V$$

$$V_3 = I \cdot R_3 = 10,68V$$

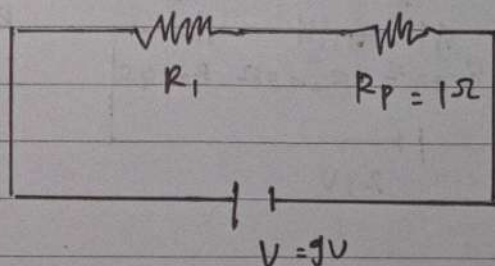
$$P_1 = V_1 \cdot I_{total}$$

$$= 5,34 \times 2,67$$

$$= 14,25W$$



→



$$R_t = 3\Omega$$

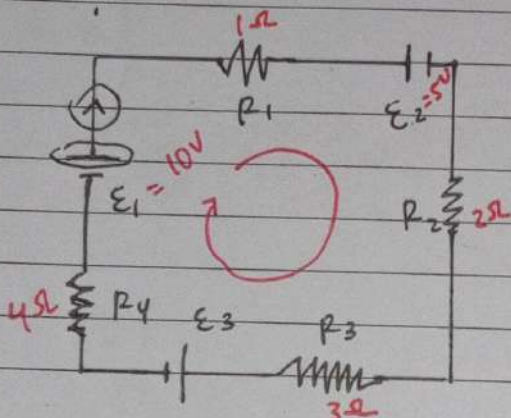
$$I_t = 3A \rightarrow \frac{V}{R_t + R_p} = \frac{9}{(2+1)}$$

$$V_{Rp} = I \cdot R_p = 3 \cdot 1 = 3V$$

$$V_{R2} = I \cdot R_p = 3 \cdot 1 = 3V$$

$$V_{R3} = I \cdot R_p = 3 \cdot 1 = 3V$$

$$V_{R1} = I \cdot R_1 = 3 \cdot 2 = 6V$$



• Arus bergerak dari potensial tinggi → rendah
 $E_1 > E_2, E_3$

1) gambar arah arus sesuai dengan besarnya arus

2) gambar loop sesuai hati.

3) jika arah arus searah dg arah loop, maka (+)

$$\sum E + \sum iR = 0$$

$$-E_1 + E_2 + E_3 + I(R_1 + R_2 + R_3 + R_4) = 0$$

$$-E_1 + E_2 + E_3 + I(R_1 + R_2 + R_3 + R_4) = 0$$

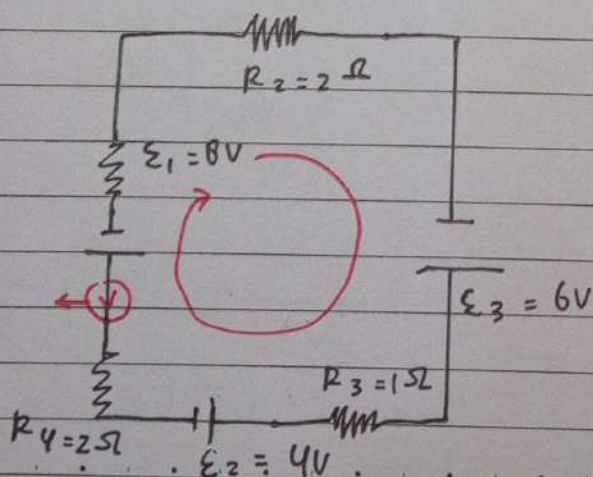
$$-10 + 5 + 3 + I(1 + 2 + 3 + 4) = 0$$

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

$$I(10) = 2$$

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

$$I = 0,2A$$



$\sum E + \sum iR = 0$ *negatif karena arah arus berlawanan dgn arah loop*

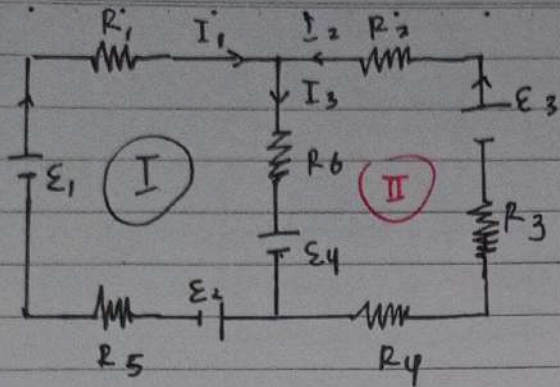
$$E_1 + E_2 - E_3 - I(R_1 + R_2 + R_3 + R_4) = 0$$

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

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

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

$$I = 1A$$



LOOP I

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

$$-\mathcal{E}_1 + \mathcal{E}_4 + \mathcal{E}_2 + I_1 (R_1 + R_5) + I_3 R_6 = 0$$

LOOP II

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

$$-\mathcal{E}_3 + \mathcal{E}_4 + I_2 (R_2 + R_3 + R_4) + I_3 R_6 = 0$$