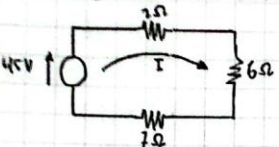


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Mata Kuliah: Elektronika Tgl: Hal: /

1. Hitung nilai I dan daya pada tiap resistor



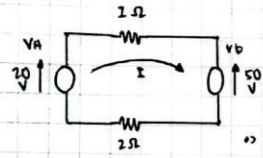
→ mencari R_{tot} :
 $R_{tot} = 2 + 6 + 7 = 15\Omega$

→ mencari I:
 $I = \frac{V}{R_{tot}} = \frac{45}{15} = 3A$

→ mencari daya tiap resistor:

- $P_{R1} = I^2 \cdot R_1 = (3)^2 \cdot 2 = 9 \cdot 2 = 18 \text{ watt}$
- $P_{R2} = I^2 \cdot R_2 = (3)^2 \cdot 6 = 9 \cdot 6 = 54 \text{ watt}$
- $P_{R3} = I^2 \cdot R_3 = (3)^2 \cdot 7 = 9 \cdot 7 = 63 \text{ watt}$
- $P_{total} = P_{R1} + P_{R2} + P_{R3} = 18 + 54 + 63 = 135 \text{ watt}$

2. Hitung nilai I dan daya pada V_A dan V_B



→ mencari R_{tot} :
 $R_{tot} = 1 + 2 = 3\Omega$

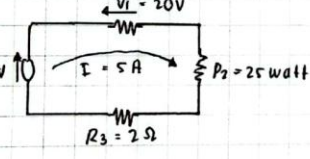
→ mencari V_{tot} :
 $V_{tot} = V_B - V_A = 50 - 20 = 30V$

maka I:
 $I = \frac{V_{tot}}{R_{tot}} = \frac{30}{3} = 10A$

→ mencari daya pada V_A dan V_B

- $P_{V_A} = V_A \cdot I = 20 \cdot 10 = 200 \text{ watt}$
- $P_{V_B} = V_B \cdot I = 50 \cdot 10 = 500 \text{ watt}$

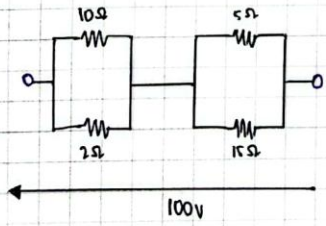
3. Hitung nilai V!



→ mencari nilai tegangan tiap resistor:

- $V_1 = 20V$; $V_2 = P = V \cdot I$; $V_3 = I \cdot R_3$
- $25 = V \cdot 5$; $5 = 5 \cdot 2$
- $V = \frac{25}{5} = 5V$; $= 10V$
- maka: $V = V_1 + V_2 + V_3 = 20 + 5 + 10 = 35V$

4. Resistor mana yang memiliki daya paling besar?



→ mencari R_{P1} :
 $R_{P1} = \frac{5 \times 15}{5 + 15} = \frac{75}{20} = 3,75\Omega$

→ mencari R_{P2} :
 $R_{P2} = \frac{10 \times 2}{10 + 2} = \frac{20}{12} = 1,67\Omega$

→ seri R_{P1} dan R_{P2} :
 $R_{tot} = 3,75 + 1,67 = 5,42\Omega$

→ mencari I total:
 $I_{tot} = \frac{V_s}{R_{tot}} = \frac{100}{5,42} = 18,45A$

mencari V_1 dan V_2 :
 $V_1 = I_{tot} \times R_{P1} = 18,45 \times 3,75 = 69,19 \text{ Volt}$
 $V_2 = I_{tot} \times R_{P2} = 18,45 \times 1,67 = 30,81 \text{ Volt}$

→ mencari daya tiap Resistor:

- $P_{R1} = \frac{V_1^2}{R_1} = \frac{(69,19)^2}{10} = 477,45 \text{ watt}$
- $P_{R2} = \frac{V_1^2}{R_2} = \frac{(69,19)^2}{2} = 2387,25 \text{ watt}$
- $P_{R3} = \frac{V_2^2}{R_3} = \frac{(30,81)^2}{5} = 379,63 \text{ watt}$
- $P_{R4} = \frac{V_2^2}{R_4} = \frac{(30,81)^2}{15} = 639,45 \text{ watt}$

Jadi, resistor yang memiliki daya paling besar adalah: 50hm dengan 957,45 watt

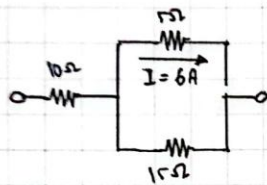


Mata Kuliah.:

Tgl :

Hal. : /

5. Hitung daya total dari ketiga resistor



→ Mencari nilai $I_3 =$

$$\begin{aligned} - V_{R_2} &= I \times R_2 \\ &= 6 \times 5 \\ &= 30 \text{ Volt} \\ V_{R_2} &= V_{R_3} \end{aligned}$$

$$\begin{aligned} \text{Maka: } I_3 &= \frac{V_{R_3}}{R_3} = \frac{30}{15} \\ &= 2 \text{ A} \end{aligned}$$

→ Mencari I_1 :

$$\begin{aligned} I_1 &= I_2 + I_3 \\ I_1 &= 6 + 2 \\ &= 8 \text{ A} \end{aligned}$$

→ mana daya pada ketiga resistor:

$$\begin{aligned} \Rightarrow P_{R_1} &= I^2 \cdot R_1 \\ &= 8^2 \cdot 10 \\ &= 64 \cdot 10 \\ &= 640 \text{ watt} \end{aligned}$$

$$\begin{aligned} \Rightarrow P_{R_2} &= I_2^2 \cdot R_2 \\ &= 6^2 \cdot 5 \\ &= 36 \cdot 5 \\ &= 180 \text{ watt} \end{aligned}$$

$$\begin{aligned} \Rightarrow P_{R_3} &= I_3^2 \cdot R_3 \\ &= 2^2 \cdot 15 \\ &= 4 \cdot 15 \\ &= 60 \text{ watt} \end{aligned}$$

→ Daya total

$$\begin{aligned} P_{\text{total}} &= 640 + 180 + 60 \\ &= 880 \text{ watt} \end{aligned}$$

6. Hitung resistansi dari lampu dengan daya 25, 60, 75 dan 100 watt saat diberi tegangan 220 volt!

Dik: $P_1 = 25 \text{ watt}$, $P_2 = 60 \text{ watt}$, $P_3 = 75 \text{ watt}$, $P_4 = 100 \text{ watt}$, $V = 220 \text{ volt}$

→ Mencari resistansi:

$$\Rightarrow P_1 = \frac{V^2}{R_1} \Rightarrow 25 = \frac{(220)^2}{R_1}$$

$$25 R_1 = 48.400 \Rightarrow R_1 = \frac{48.400}{25}$$

$$R_1 = 1.936 \text{ ohm}$$

$$\Rightarrow P_2 = \frac{V^2}{R_2} \Rightarrow 60 = \frac{(220)^2}{R_2}$$

$$60 R_2 = 48.400 \Rightarrow R_2 = \frac{48.400}{60}$$

$$R_2 = 806,67 \text{ ohm}$$

$$\Rightarrow P_3 = \frac{V^2}{R_3} \Rightarrow 75 = \frac{(220)^2}{R_3}$$

$$75 R_3 = 48.400 \Rightarrow R_3 = \frac{48.400}{75}$$

$$R_3 = 645,33 \text{ ohm}$$

$$\Rightarrow P_4 = \frac{V^2}{R_4} \Rightarrow 100 = \frac{(220)^2}{R_4}$$

$$100 R_4 = 48.400 \Rightarrow R_4 = \frac{48.400}{100}$$

$$R_4 = 484 \text{ ohm}$$