KEMENTERIAN PENDIDIKAN,KEBUDAYAAN,RISET,DAN TEKNOLOGI
POLITEKNIK MANUFAKTUR BANDUNG
(POLITEKNIK MEKANIK SWISS - ITB)

| Mata Kuliah.: | Tgl : | Hal. : 1 |

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1.)

2Ω

45V   6Ω   I

7Ω

Rtot:
Rek = 2+6+7
Rek = 15 Ω

$I = \dfrac{V}{Rek} = \dfrac{45}{15} = 3\ A$

mencari resistor

$P_{R1} = I^2 \cdot R_1$
$= (3)^2 \cdot 2$
$= 9 \cdot 2 = 18\ watt$

$P_{R2} = I^2 \cdot R_2$
$= (3)^2 \cdot 6$
$= 9 \cdot 6 = 54\ watt$

$P_{R3} = I^2 \cdot R_3$
$= (3)^2 \cdot 7$
$= 9 \cdot 7 = 63\ watt$

2.)

1Ω

Va 20V   I →   Vb 50V

2Ω

$R_{tot} = R_1 + R_2$
$= 1 + 2$
$= 3\ Ω$

$V_{tot} = V_B - V_A$
$= 50 - 20$
$= 30\ V$

$I = \dfrac{V_{tot}}{R_{tot}}$
$= \dfrac{30}{3} = 10\ A$

daya ke-2 Vs

$P_{VA} = V_a \cdot I$
$= 20 \cdot 10$
$= 200\ watt$

$P_{VB} = V_b \cdot I$
$= 50 \cdot 10$
$= 500\ watt$

3.)

$V_1 = 20\ V$

VT   I = 5A   R₂ = 25 W

R₃ = 2 Ω

$V_1 = 20\ V$

$V_2 = P = U \cdot I$
$25 = V \cdot I$
$25 = 5V$
$V = \dfrac{25}{5} = 5V$

$V_3 = I \cdot R_3$
$= 5 \cdot 2$
$= 10\ V$

$V = V_s$
$V_s = V_1 + V_2 + V_3$
$V_s = 20 + 5 + 10$
$V_s = 35$

4.)

R₃ 10Ω   R₁ 5Ω

2Ω   15Ω

Ru   R₂

400V

V₂ 1,67Ω   V₁ 3,75Ω
Rp₂   Rp₁

Rtot :

R₁ & R₂
$Rp_1 = \dfrac{R_1 \cdot R_2}{R_1 + R_2} = \dfrac{5 \times 15}{5 + 15} = \dfrac{75}{20} = 3,75\ Ω$

R₃ & R₄
$Rp_2 = \dfrac{R_3 \cdot R_4}{R_3 + R_4} = \dfrac{10 \cdot 2}{10 + 2} = \dfrac{20}{12} = 1,67\ Ω$

$Rs = Rp_1 + Rp_2$
$= 3,75 + 1,67$
$= 5,42\ Ω$

$I_{tot} = \dfrac{Vs}{R_{tot}} = \dfrac{400}{5,42} = 18,45\ A$

$V_1 = V - I_{tot} \times Rp_1$
$= 18,45 \times 3,75$
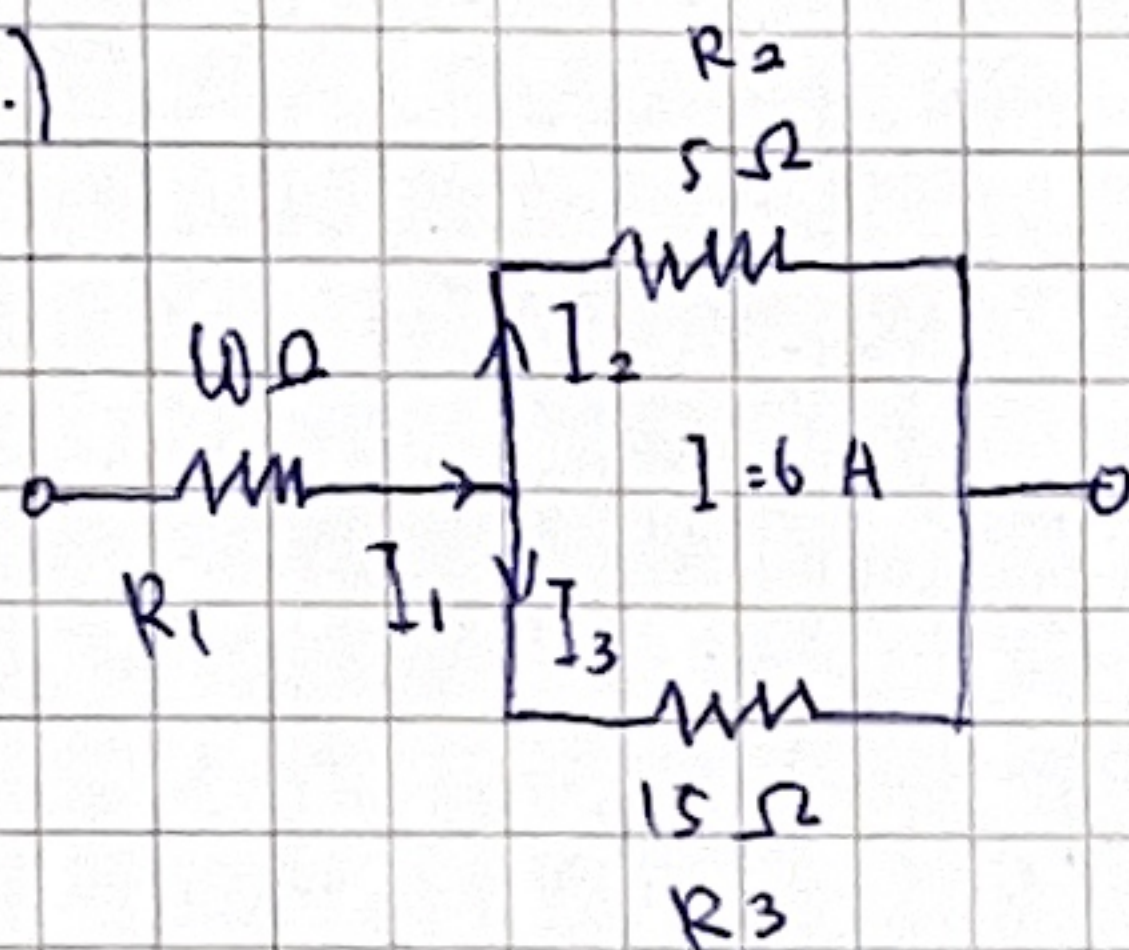$= 69,18$

$V_2 = V = I_{tot} \times Rp_2$
$= 18,45 \times 1,67$
$= 30,81\ V$

Mencari daya tiap resistor

$-P_{R1} = \dfrac{V_1^2}{R_1} = \dfrac{69,18^2}{5} = \dfrac{4.785.8}{5} = 957,16$ watt

$-P_{R2} = \dfrac{V_1^2}{R_2} = \dfrac{69,18^2}{15} = \dfrac{4.785.8}{15} = 319,05$ watt

R1 sebesar 5 ohm

dengan 957,16 watt

$-P_{R3} = \dfrac{V_2^2}{R_3} = \dfrac{30,81^2}{10} = \dfrac{949,25}{10} = 94,9$ watt

$-P_{R4} = \dfrac{V_2^2}{R_4} = \dfrac{30,81^2}{2} = \dfrac{949,25}{2} = 474,6$ watt

5.)

$I_3 = ?$

$-V_{R2} = I \times R_2$
$= 6 \times 5$
$= 30 V$

$V_{R2} = V_{R3}$

$I_1 = ?$
$I_1 = I_2 + I_3$
$= 6 + 2 = 8 A$

maka $= I_3 = \dfrac{V_{R3}}{R_3} = \dfrac{30}{15} = 2 A$

ketiga resistor =

a) $P_{R1} = I_1^2 \cdot R_1$ $P_{R2} = I_2^2 \cdot R_2$
     $= 8^2 \cdot 10$ $= 6^2 \cdot 5$
     $= 64 \cdot 10$ $= 36 \cdot 5$
     $= 640$ $= 180 W$

$P_{R3} = I_3^2 \cdot R_3$
     $= 2^2 \cdot 15$
     $= 4 \cdot 15$
     $= 60$ watt

Daya total $= 640 + 180 + 60 = 880$ watt

6.) Dik : $P_1 = 25$ W
        $R_2 = 60$ W
        $P_3 = 75$ W
        $R_4 = 100$ W
        $U = 220 V$

b) resistansi :

$\circ P_1 = \dfrac{V^2}{R_1}$

$25 = \dfrac{220^2}{R_1}$

$25 R_1 = 48.400$

$R_1 = \dfrac{48.400}{25} = 1.936 \,\Omega$

$\circ P_3 = \dfrac{V^2}{R_3}$

$75 = \dfrac{220^2}{R_3}$

$75 R_3 = 48.400$

$R_3 = \dfrac{48.400}{75}$

$R_3 = 645,3 \,\Omega$

$\circ R_2 = \dfrac{V^2}{R_2}$

$60 = \dfrac{220^2}{R_2}$

$60 R_2 = 48.400$

$R_2 = \dfrac{48.400}{60} = 806,67 \,\Omega$

$\circ R_4 = \dfrac{V^2}{R_4}$

$100 = \dfrac{220^2}{R_4}$

$100 R_4 = 48.400$

$R_4 = \dfrac{48.400}{100}$

$R_4 = 484 \,\Omega$