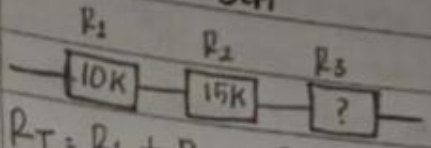
TUGAS ELEKTRONIKA DAN FISIKA DASAR

1. Rangkaian Seri



$R_T = R_1 + R_2 + R_3$

$30 = 10 + 15 + R_3$

$R_3 = 30 - 10 + 15$

$= 5\ K\Omega$

$I = \frac{V}{R} = \frac{5}{30} = 0.00016\ A$

2. $R_T = R_1 + R_2 + R_3$

$= 25.5K + 70 + 150$

$= 25.500 + 70 + 150$

$= 25.720\ \Omega$

$I = \frac{V}{R} = \frac{15}{25.720} = 0.00058\ A$

3. $R_T = R_1 + R_2 + R_3$

$100 = 25 + 15 + R_3$

$R_3 = 100 - 40$

$= 60\ K\Omega$

$I = \frac{V}{R} = \frac{5}{100K} = \frac{5}{100.000} = 0.00005\ A$

Nilai Resistor

1. Hijau – Orange – Hitam – Perak
   5 3 0 10%
   $R = 53 \times 10^0 = 530 = 53K\Omega \rightarrow 10\% = 5.3$
   $= 53K\Omega - 10\% = 47.7K\Omega$
   $= 53K\Omega + 10\% = 58.3K\Omega$

2. Kuning – Merah – Merah – Emas
   4 2 2 5%
   $R = 42 \times 10^2 = 4.200 = 4.2K\Omega \rightarrow 5\% = 0.21$
   $= 4.2K\Omega - 5\% = 3.99K\Omega$
   $= 4.2K\Omega + 5\% = 4.41K\Omega$

3. Hijau – Hijau – Orange – X
   5 5 3 20%
   $R = 55 \times 10^3 = 55.000 = 55K\Omega \rightarrow 20\% = 11$
   $= 55K\Omega - 20\% = 44K\Omega$
   $= 55K\Omega + 20\% = 66K\Omega$

4. Orange – Orange – Kuning – Perak
   3 3 4 10%
   $R = 33 \times 10^4 = 330.000 = 330K\Omega \rightarrow 10\% = 33$
   $= 330K\Omega - 10\% = 297K\Omega$
   $= 330K\Omega + 10\% = 363K\Omega$

5. Abu² – Hitam – Merah – Emas
   8 0 2 5%
   $R = 80 \times 10^2 = 8.000 = 8.0K\Omega \rightarrow 5\% = 0.4$
   $= 8,0K\Omega - 5\% = 7,6K\Omega$
   $= 8,0K\Omega + 5\% = 8,4K\Omega$

6. Ungu – Hijau – Hitam – X
7 5 0 20%
R = 75 x 10° = 750 = 75 KΩ → 20% = 15
= 75 KΩ – 20% = 60 KΩ
= 75 KΩ + 20% = 90 KΩ

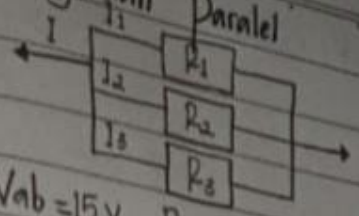
7. Ungu – merah – Ungu – perak
7 2 7 10%
R = 72 x 10⁷ = 720.000.000 = 720 MΩ → 10% = 72
= 720 MΩ – 10% = 648 MΩ
= 720 MΩ + 10% = 792 MΩ

8. Hijau – Hijau – Hijau – X
5 5 5 20%
R = 55 x 10⁷ = 5.500.000 = 5,5 MΩ → 20% = 1.1
= 5,5 MΩ – 20% = 4,4 MΩ
= 5,5 MΩ + 20% = 6,6 MΩ

9. Biru – Hijau – Ungu – Emas
6 5 7 5%
R = 65 x 10⁷ = 650.000.000 = 650 MΩ → 5% = 32,5
= 650 MΩ – 5% = 617,5 MΩ
= 650 MΩ + 5% = 682,5 MΩ

10 Kuning – Hijau – Biru – X
4 5 6 20%
R = 45 x 10⁶ = 45.000.000 = 45 MΩ → 20% = 9
= 45 MΩ – 20% = 36 MΩ
= 45 MΩ + 20% = 54 MΩ

Rangkaian Paralel



1. Vab = 15V $R_1 = 15K\Omega$ $R_2 = 50\Omega$ $R_3 = 100\Omega$ $R_T = ?$

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$= \frac{1}{15K} + \frac{1}{50} + \frac{1}{100}$$ → Cari KPK untuk menyamakan penyebut

$$= \frac{1}{15K} + \frac{300}{15K} + \frac{150}{15K}$$

$$= \frac{451}{15K}$$ balikan penyebut dan pembilangnya

$$R_T = \frac{15K}{451} = 33,2\Omega$$

2. $$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$= \frac{1}{10} + \frac{1}{150K} + \frac{1}{200}$$ → Cari KPK

$$= \frac{15K}{150K} + \frac{1}{150K} + \frac{750}{150K}$$

$$= \frac{15.751}{150K}$$ balikan penyebut dan pembilang

$$R_T = \frac{150K}{15.751} = 9,52\Omega$$

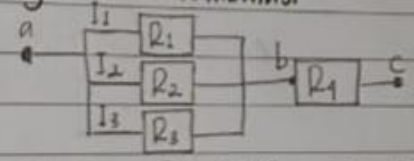
3. $V_{ab} = 5V$ $R_1 = 150k\Omega$ $R_2 = 25k\Omega$ $R_3 = 100\Omega$

$I_1 = \frac{V_{ab}}{R_1} = \frac{5}{150.000} = 3,33\ A$

$I_2 = \frac{V_{ab}}{R_2} = \frac{5}{25.000} = 0.0002\ A$

$I_3 = \frac{V_{ab}}{R_3} = \frac{5}{100} = 0,05\ A$

✳ Rangkaian Kombinasi



1. $R_1 = 100\Omega$ $R_2 = 1k\Omega$ $R_3 = 15k\Omega$ $R_4 = 100k\Omega$ $R_T = ?$

• Cari R paralel

$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

$= \frac{1}{100} + \frac{1}{1k} + \frac{1}{15k}$ → Cari KPK

$= \frac{150}{15K} + \frac{15}{15k} + \frac{1}{15k} = \frac{166}{15K}$ ↑ balikan, ↓ Penyebut dan pembilang

$R_p = \frac{15K}{166} = 90,3\Omega$

• R_p — R_4

$R_T = R_p + R_4$

$= 90,3\Omega + 100k\Omega$

$= 100.090,3\ \Omega$

2. $I = 2A$ $V_{bc} = ?$

$V = I \cdot R$

$V_{bc} = I \cdot R_4$

$= 2.100k\Omega$

$= 200.000\ V = 200kV$

3. $R_1 = 100\,k\Omega$ $R_2 = 47k\Omega$ $R_3 = ?$ $R_4 = 150k\Omega$ bila $I = 2A$

$V_{ac} = 15\ V$

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

$R_3 = \frac{15}{2}$

$R_3 = 7.5\Omega$