

77

2) Dik: $v_1 = 10 \frac{\text{km}}{\text{h}}$
 $S_1 = 5 \text{ km}$
 $S_2 = 3,5 \text{ km}$
 $v_0 = 40 \frac{\text{km}}{\text{h}}$
 $t_2 = 30 \text{ s}$
 $a = ?$

Jawab:

$$t_1 = \frac{10}{3600} \cdot 5 = 0,0625 \text{ h} = 225 \text{ s}$$

$$t = 225 + 30 = 255$$

$$S = v_0 t + \frac{a t^2}{2} \quad 1.2$$

$$2S = 2v_0 t + a t^2$$

$$2S - 2v_0 t = a t^2$$

$$a = \frac{2S - 2v_0 t}{t^2} \approx \frac{0,205}{0,255^2} \frac{\text{m}}{\text{s}^2}$$

$$v = v_0 + a t = 15,7236 \text{ m/s}$$

3019 m 481 m

$$\frac{\text{km} \cdot 1000}{\text{h} \cdot 3600} = \frac{\text{m}}{\text{s} \cdot 3600}$$

1) Dik: $R_0 = 1,23 \text{ Ohm}$
 $T_0 = 20^\circ \text{C}$
 $l_0 = 10 \text{ m}$
 $T = 100^\circ \text{C}$
 $\alpha_L = 2,43 \cdot 10^{-3} \text{ K}^{-1}$
 $\alpha_R = 3,92 \cdot 10^{-3} \text{ K}^{-1}$
 $R = ?$

Jawab:

$$R = R_0 (1 + \alpha (T - T_0))$$

$$R = 1,23 \text{ Ohm} (1 + 3,92 \cdot 10^{-3} (100^\circ \text{C} - 20^\circ \text{C})) = 1,615722 \text{ Ohm}$$

Jawab: 1,615722 Ohm

3) Dik:

$$L = 20 \text{ m}$$

$$D = 40 \mu\text{m} = 0,4 \text{ m}$$

$$f = 0,7$$

$$\lambda = 220 \frac{\text{m}}{\text{s}} = 0,22 \frac{\text{m}}{\text{s}}$$

$$A = ?$$

Jawab:

$$C = 2\pi R = \pi D \approx 1,256 \text{ m}$$

$$N = \frac{L}{C} = \frac{20}{1,256} = 16$$

$$m = L \cdot \lambda = 20 \text{ m} \cdot 0,22 \frac{\text{m}}{\text{s}} = 4,4 \text{ kg}$$

$$F = mg = 44 \text{ N}$$

$$F = N$$

$$F_{\text{min}} = f \cdot N = 0,7 \cdot 44 = 30,8 \text{ N}$$

$$A = (44 + 30,8) \cdot 16 = 1196,8 \text{ J}$$

Jawab: 1196,8 J

55

4) Dano:

$$R = 57 \mu\Omega = 0,057 \Omega$$

$$d = 3,5 \mu\text{m} = 0,035 \mu$$

$$r_0 = 85 \Omega$$

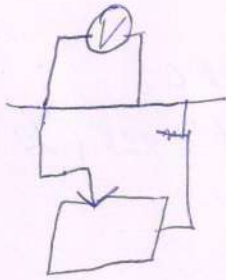
$$U = 12 \text{ B}$$

$$I = 140 \mu\text{A} = 0,14 \text{ A}$$

$$\mu_0 = 1,27 \cdot 10^{-6} \frac{\text{R}}{\mu}$$

K-?

Diagram.



3) Dano:

Diagram.

$$\rho_{\text{th}} = 30 \%$$

$$V = 5 \mu$$

$$v = 3 \frac{\mu}{\text{a}}$$

$$t = 25^\circ \text{C}$$

$$\rho = 23 \frac{\Omega}{\mu^3}$$

$$a = 4 \mu$$

$$b = 5 \mu$$

$$h = 2,5 \mu$$

$$\rho = 997 \frac{\Omega}{\mu^3}$$

$$\rho_{\text{th}} = ?$$

7

Umoro: 195

1) Dano:

$$R_0 = 1,23 \text{ } \Omega$$

$$T_0 = 20^\circ \text{C}$$

$$t_0 = 293 \text{ K}$$

$$T = 100^\circ \text{C}$$

$$L_L = 2,43 \cdot 10^{-3} \text{ K}^{-1}$$

$$L_R = 3,92 \cdot 10^{-3} \text{ K}^{-1}$$

$$R = ?$$

Penyelesaian.

$$R = R_0 (1 + L_R (T - T_0)) +$$

$$R = 1,23 \text{ } \Omega (1 + 3,92 \cdot 10^{-3} \text{ K}^{-1} (373 \text{ K} - 293 \text{ K})) =$$

$$= 1,615728 \text{ } \Omega$$

Jawab: $1,615728 \text{ } \Omega$

45

2) Dano:

$$v_1 = 80 \frac{\text{km}}{\text{h}} = (80 : 3,6) \frac{\text{m}}{\text{s}}$$

$$S_1 = 5 \text{ km} = 5000 \text{ m}$$

$$S_2 = 3,5 \text{ km} = 3500 \text{ m}$$

$$v_{02} = 40 \frac{\text{km}}{\text{h}} = (40 : 3,6) \frac{\text{m}}{\text{s}}$$

$$t_3 = 30 \text{ s}$$

$$a = ?$$

Penyelesaian

$$t_1 = \frac{S_1}{v_1} = \frac{5000 \text{ m} \cdot 3,6}{80} = 225 \text{ s}$$

$$t_2 = 225 \text{ s} + t_3 = 225 \text{ s} + 30 \text{ s} = 255 \text{ s}$$

$$S_2 = v_{02} t_2 + \frac{a t_2^2}{2} \quad | \cdot 2$$

$$2 S_2 = 2 v_{02} t_2 + a t_2^2$$

$$a t_2^2 = 2 S_2 - 2 v_{02} t_2$$

$$a = \frac{2 S_2 - 2 v_{02} t_2}{t_2^2} = \frac{2 \cdot 3500 \text{ m} - 2 \cdot 40 \cdot 3,6}{(255 \text{ s})^2}$$

$$= \frac{2 \cdot 3500 \text{ m} - 2 \cdot \frac{400}{36} \frac{\text{m}}{\text{s}} \cdot 255 \text{ s}}{(255 \text{ s})^2} \approx 0,0205 \frac{\text{m}}{\text{s}^2}$$

Jawab: $0,0205 \frac{\text{m}}{\text{s}^2}$

105