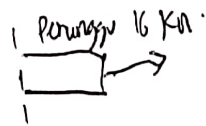


Upload Tugas Pertemuan ke 4

SOAL. 4.

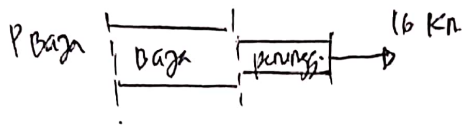
NAMA : HERLIN TAUFIK UTAMA

NIM : 182710047



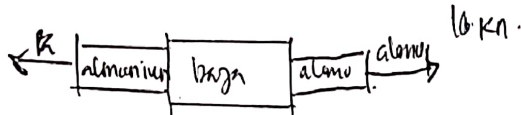
$$\sum F_x = 0$$

$$P_p = 16$$



$$\sum F_x = 0$$

$$-P_{Bagas} + 16 = 0$$



$$\sum F_x = 0$$

$$R = 71$$

$$A_p = \frac{1}{4} \pi (d_p)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_B = \frac{1}{4} \pi (d_B)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi (d_a)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_p = \frac{P_p}{A_p} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ MPa}$$

$$\sigma_B = \frac{P_B}{A_B} = \frac{51 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 41 \text{ MPa}$$

$$\sigma_A = \frac{P_A}{A_a} = \frac{71 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 145 \text{ MPa}$$

$$\begin{aligned}
 T_{\text{Baja}} &= \left(\frac{A \cdot E \cdot \delta}{L} \right)_{\text{Baja}} \\
 &= \frac{201.06 (200) 10^3 \cdot \delta}{3000} \\
 &= 13404 \delta
 \end{aligned}$$

$$\delta_{\text{perunggu}} = \left(\frac{T \cdot L}{A E} \right)_{\text{P.}}$$

$$\begin{aligned}
 T_{\text{perunggu}} &= \left(\frac{A \cdot E \cdot \delta}{L} \right)_{\text{perunggu}} \\
 &= \frac{380 \cdot 13 \cdot 1000 \cdot 10^3 \cdot \delta}{3000} \\
 &= 12671 \delta
 \end{aligned}$$

$$2 T_{\text{Baja}} + T_{\text{perunggu}} = 75.$$

$$2 (13404 \delta) + (12671 \delta) = 75.$$

$$26808 \delta + 12671 \delta = 75 \cdot 10^3.$$

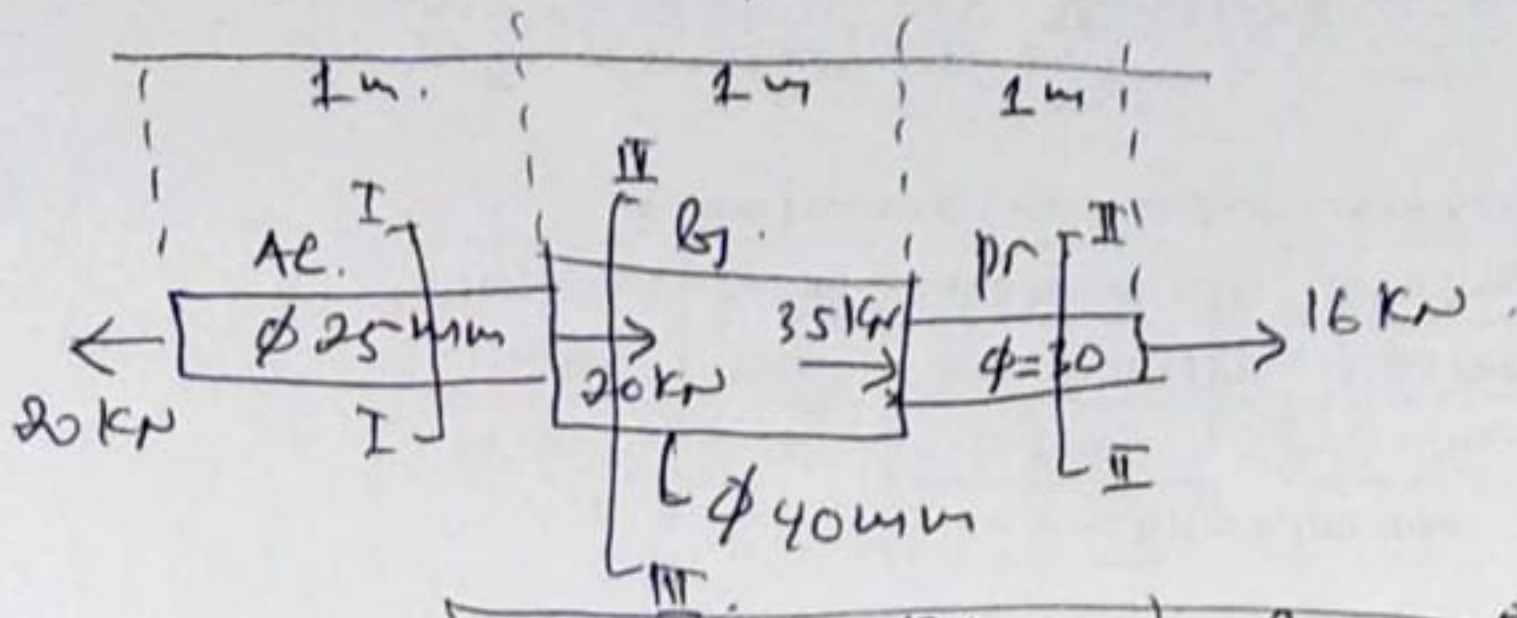
$$\delta = 1.89$$

$$\sigma_{\text{Baja}} = \frac{T_{\text{Baja}}}{A_{\text{Baja}}} = \frac{13404 (1.89)}{201.06} = 126 \text{ MPa.}$$

$$\sigma_{\text{perunggu}} = \frac{T_{\text{P}}}{A_{\text{P}}} = \frac{12671 \delta}{380.13} = \frac{12671 (1.89)}{380.13} = 63 \text{ MPa.}$$

Nama: Idris, Rozanova.
Nim: 182170028.

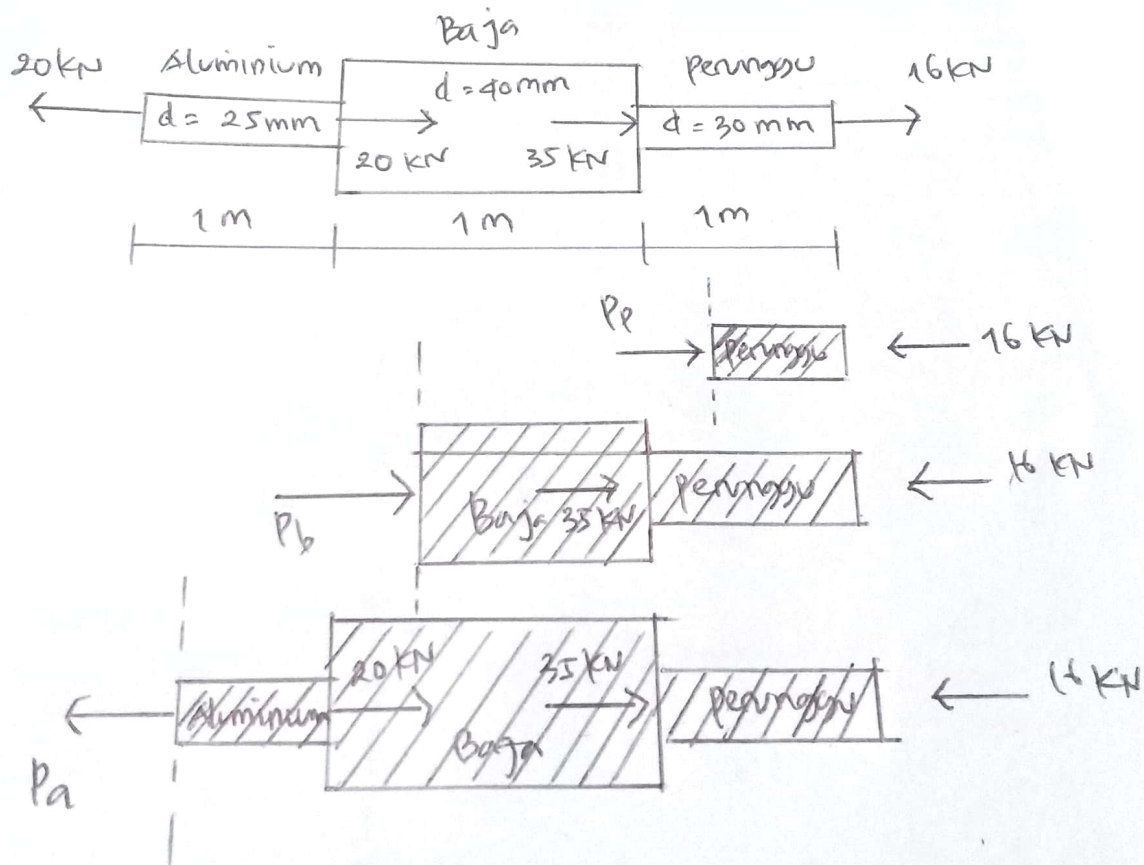
Tugas Pertemuan 4.



	AL	Bj	Pr.	P	S
A	490,6	1256	706,5	20	
E	200	70	100	55	
L	1000	1000	1000		
P.	20	55	51.		
ES	0,204.	0,626	0,722.		
ET	20,02.	55,04	51,01		
σ	40,8 N/mm	43,8 N/mm	72,2 N/mm		

Soal pertemuan 4

Sebuah batang terdiri atas tiga material yaitu baja, aluminium dan perunggu yang dihubungkan secara kaku. Beban aksial bekerja pada kedudukan seperti diperlihatkan pada gambar. Penampang batang berbentuk lingkaran. Hitunglah tegangan pada setiap bahan.



Penyelesaian :

$$P_p = 16 = 0$$

$$P_p = 16 \text{ kN}$$

$$P_b + 35 - 16 = 0$$

$$P_b = -19 \text{ kN}$$

$$-P_a + 20 + 35 = 16 = 0$$

$$P_a = 39 \text{ kN}$$

Langgutan soal 4

$$A_p = \frac{1}{4} \pi (d_p)^2 \\ = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi (d_b)^2 \\ = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi (d_a)^2 \\ = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

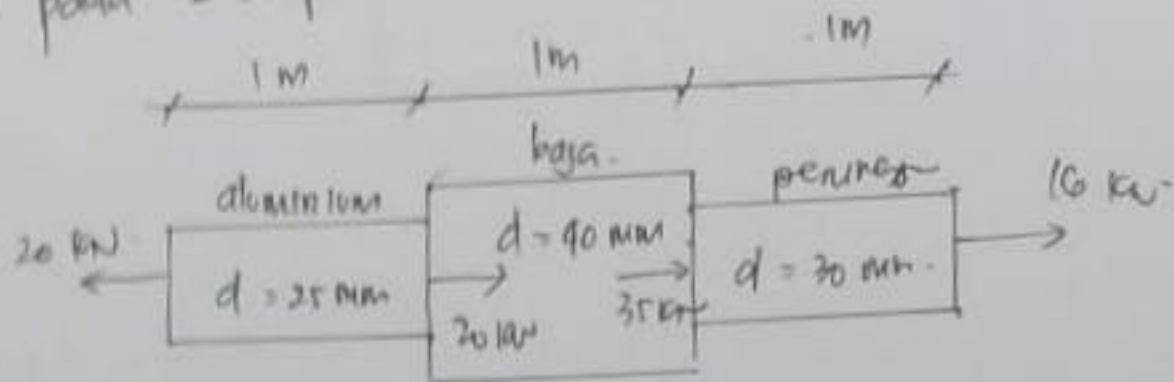
$$\sigma = \frac{P}{A}$$

$$\sigma_p = \frac{P_r}{A_p} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ Mpa}$$

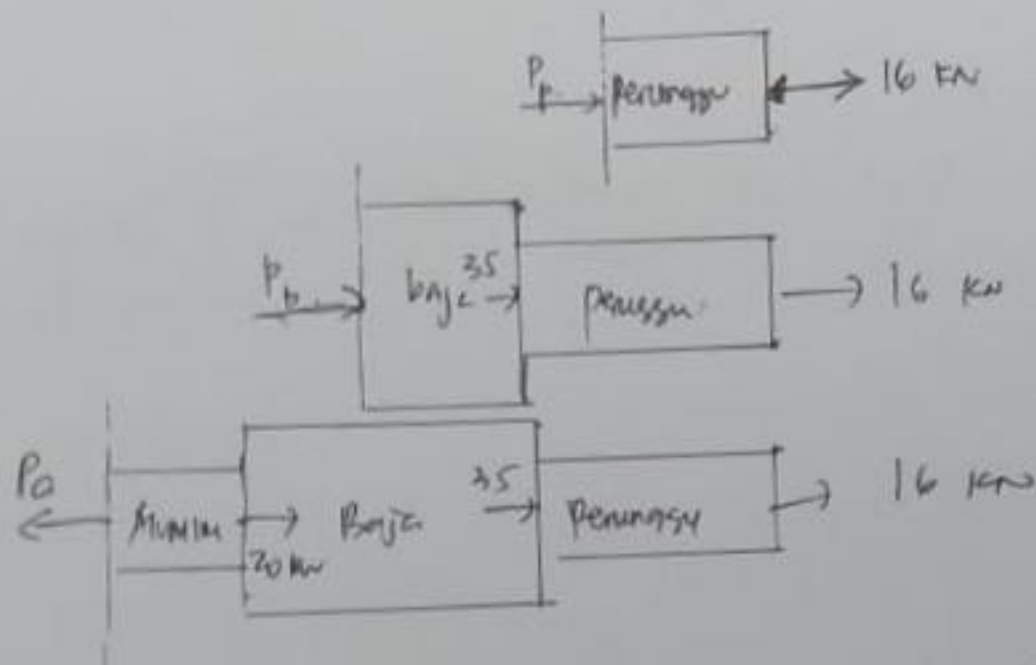
$$\sigma_b = \frac{P_b}{A_b} = \frac{-19 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 15,12 \text{ Mpa}$$

$$\sigma_a = \frac{P_a}{A_a} = \frac{39 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 79,43 \text{ Mpa}$$

Seal
 Suatu batang terdiri dari tiga material yaitu baja, aluminium dan perunggu yang dihubungkan secara kaku, beban axial bekerja pada kedudukan seperti diperlihatkan pada gambar. Penampang batang berbentuk lingkaran, hitunglah tegangan pada setiap bahan.



Jawab :



$$P_p + 16 = 0$$

$$P_p = -16 \text{ kN}$$

$$P_b + 35 + 16 = 0$$

$$P_b = -51 \text{ kN}$$

$$-P_a + 20 + 35 + 16 = 0$$

$$P_a = 71 \text{ kN}$$

$$A_p = \frac{1}{4} \pi (d_p)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi (d_b)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi (d_a)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_p = \frac{P_p}{A_p} = \frac{-16 \times 10^3 \text{ N}}{707 \text{ mm}^2} = -22.63 \text{ MPa} \quad (\text{perunggu})$$

$$\sigma_b = \frac{P_b}{A_b} = \frac{-51 \times 10^3 \text{ N}}{1257 \text{ mm}^2} = -40.57 \text{ MPa} \quad (\text{baja})$$

$$\sigma_a = \frac{P_a}{A_a} = \frac{71 \times 10^3 \text{ N}}{491 \text{ mm}^2} = 144.60 \text{ MPa} \quad (\text{aluminium})$$

$$\Delta \text{Perunggu} = \left(\frac{T \cdot L}{AE} \right) P.$$

$$T_{\text{Perunggu}} = \left(\frac{A \cdot E \cdot \delta}{L} \right) \Delta \text{Perunggu}.$$

$$= \frac{380 \cdot 13 \cdot 100 \cdot 10^3 \cdot \delta}{3000}$$

$$= 12671.8$$

$$T_{\text{Baja}} + T_{\text{Perunggu}} = 75.$$

$$2 \cdot (13404 \delta) + (12671.8 \delta) = 75$$

$$26808 \delta + 12671.8 \delta = 75 \cdot 10^3.$$

$$\delta = 1.89.$$

$$\sigma_{\text{Baja}} = \frac{T_{\text{Baja}}}{A_{\text{Baja}}} = \frac{13404 (1.89)}{101.06} = 126 \text{ Mpa.}$$

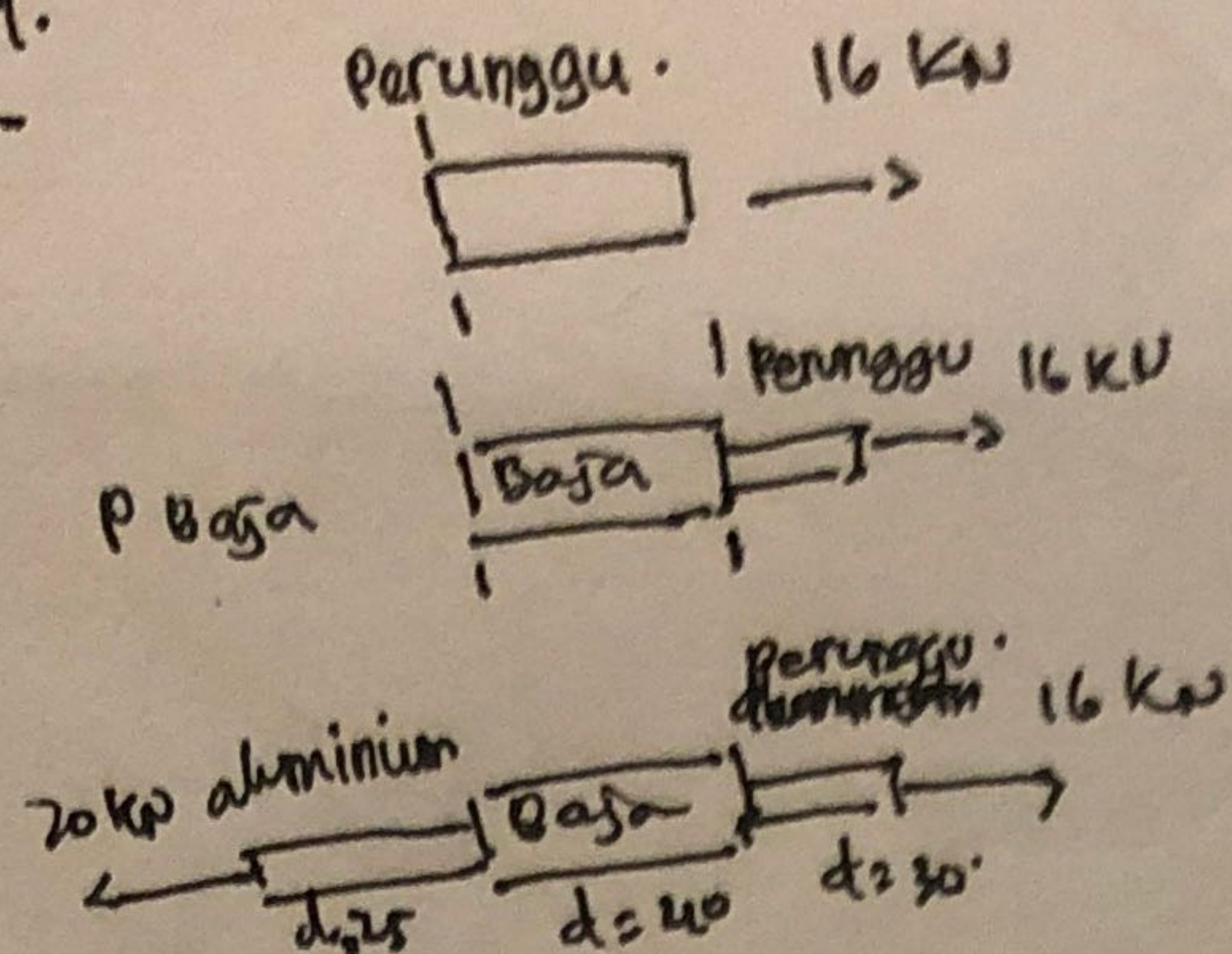
$$\sigma_{\text{Perunggu}} = \frac{T_P}{A_P} = \frac{12671.8 \delta}{380 \cdot 13} = \frac{12671.8 (1.89)}{740.13} = 63 \text{ Mpa.}$$

NAMA: RUD ANDRO BELLI

NIM: 102710043

M.Kul: ~~Mekanika Rekayasa.~~
MATEMATIKA TERAPAN.

Soal: 4.



$$\begin{aligned} \triangleright P_P + 16 &= 0 \\ P_P &= -16 \end{aligned}$$

$$\begin{aligned} \triangleright P_{Baja} + 35 - 16 &= 0 \\ -P_{Baja} &= 51 \end{aligned}$$

$$\begin{aligned} \triangleright P_{aluminium} + 20 + 35 + 16 &= 0 \\ P_A &= -71 \end{aligned}$$

$$A_P = \frac{1}{4} \pi (d_P)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_B = \frac{1}{4} \pi (d_B)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_A = \frac{1}{4} \pi (d_A)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_P = \frac{P_P}{A_P} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ Mpa}$$

$$\sigma_B = \frac{P_B}{A_B} = \frac{51 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 41 \text{ Mpa}$$

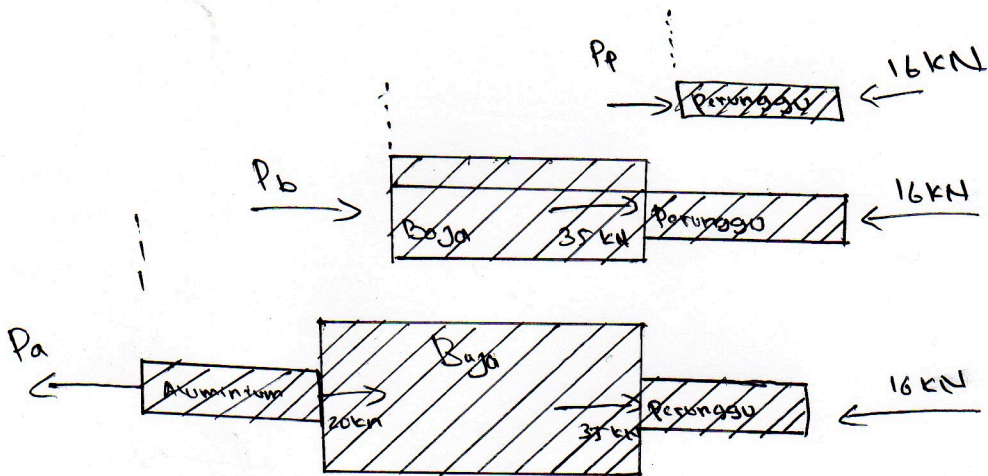
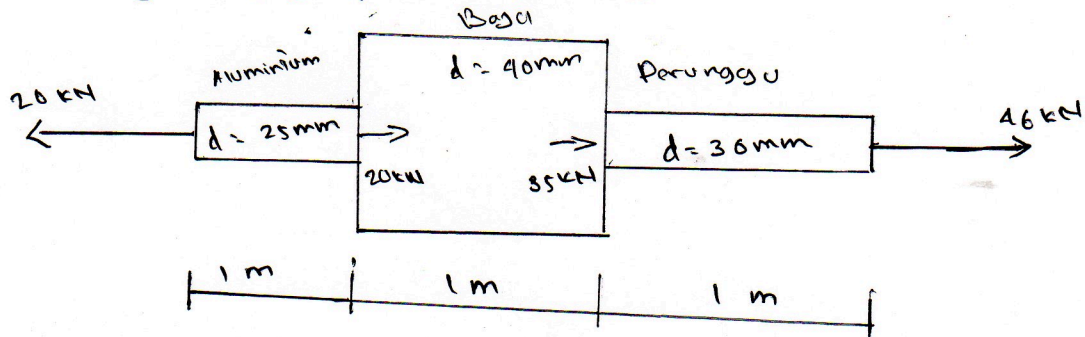
$$\sigma_A = \frac{P_A}{A_A} = \frac{71 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 145 \text{ Mpa}$$

$$\sigma_{Baja} = \left(\frac{A \cdot E \cdot \delta}{L} \right)_{Baja}$$

$$= \frac{201.06 (200) 10^3 \cdot \delta}{3000}$$

$$= 13404.8$$

Sebuah batang terdiri atas 3 material, yaitu baja, aluminium, dan perunggu yg dihubungkan secara seri. Beban aksial bekerja pada kedudukan seperti diperlihatkan pd gambar. Penampang batang berbentuk lingkaran. Hitunglah tegangan pada setiap bahan.



Penyelesaian:

$$P_p = 16 = 0$$

$$P_p = 16 \text{ kN}$$

$$P_b + 35 - 16 = 0$$

$$P_b = -19 \text{ kN}$$

$$-P_a + 20 + 35 = 16 = 0$$

$$P_a = 39 \text{ kN}$$

$$A_p = \frac{1}{4} \pi (d_p)^2$$

$$= \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi (d_b)^2$$

$$= \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi (d_a)^2$$

$$= \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

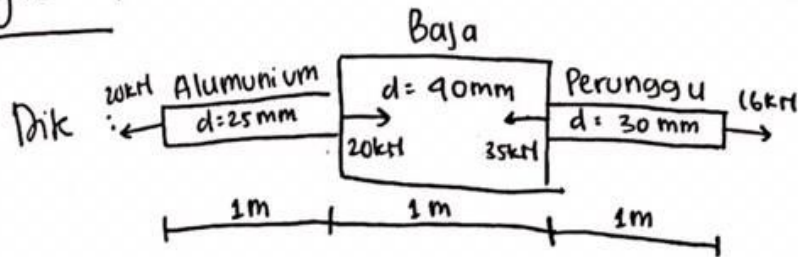
$$\sigma_p = \frac{P_p}{A_p} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ Mpa}$$

$$\sigma_b = \frac{P_b}{A_b} = \frac{-19 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 15,11 \text{ Mpa}$$

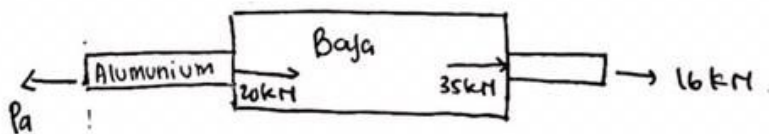
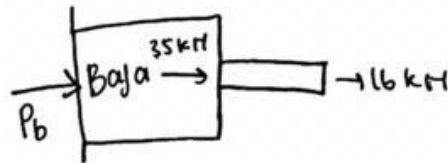
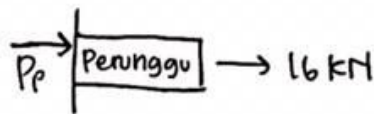
$$\sigma_a = \frac{P_a}{A_a} = \frac{39 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 79,43 \text{ Mpa}$$

Zul Aslam / 182710039

Tugas 4



Tanya: Hitung Tegangan Pada setiap bahan



Jawab: $P_p - 16 = 0 \Rightarrow 16 \text{ kN}$

$P_b + 35 - 16 = 0 \Rightarrow 19 \text{ kN}$

$-P_a + 20 + 35 - 16 = 0 \Rightarrow 39 \text{ kN}$

Was: $A_p = \frac{1}{4} \pi d^2 = \frac{1}{4} \cdot 3,14 \cdot 30^2 \Rightarrow 707 \text{ mm}^2$

$A_b = \frac{1}{4} \pi d^2 = \frac{1}{4} \cdot 3,14 \cdot 40^2 \Rightarrow 1.257 \text{ mm}^2$

$A_a = \frac{1}{4} \pi d^2 = \frac{1}{4} \cdot 3,14 \cdot 25^2 \Rightarrow 491 \text{ mm}^2$

Tegangan setiap batang: $\tau = \frac{P}{A}$

$\tau_p = \frac{16 \cdot 10^3 \text{ N}}{707} = 22,63 \text{ mPa}$

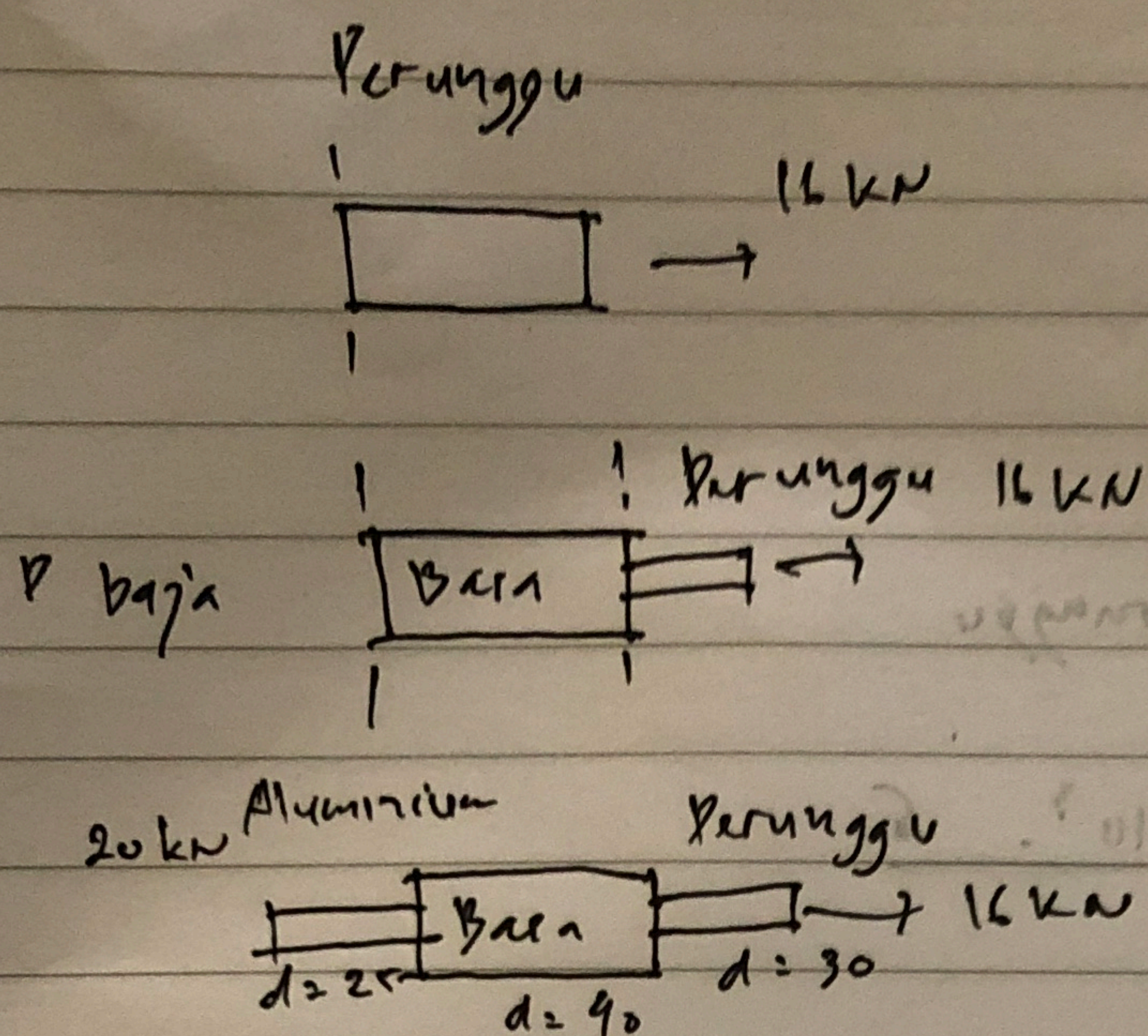
$\tau_b = \frac{19 \cdot 10^3 \text{ N}}{1.257} = 15,11 \text{ mPa}$

$\tau_a = \frac{39 \cdot 10^3 \text{ N}}{491} = 79,42 \text{ mPa}$



Nama : Akhirudin
 NIM : 182710045
 Mata Kuliah : Matematika Terapan

Soal 4 :



$$\begin{aligned} \sum F_x + 16 &= 0 \\ P_P &= 16 \end{aligned}$$

$$\begin{aligned} \sum F_{Baja} + 35 - 16 &= 0 \\ - P_{Baja} &= 51 \end{aligned}$$

$$\begin{aligned} \sum F_{Aluminium} + 20 + 35 + 16 &= 0 \\ P_A &= 71 \end{aligned}$$

$$A_P = \frac{1}{4} \pi (d_P)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_B = \frac{1}{4} \pi (d_B)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_A = \frac{1}{4} \pi (d_A)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_P = \frac{P_P}{A_P} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ MPa}$$

$$\sigma_B = \frac{P_B}{A_B} = \frac{51 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 41 \text{ MPa}$$

$$\sigma_A = \frac{P_A}{A_A} = \frac{71 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 145 \text{ MPa}$$

$$\sigma_{\text{Baja}} = \frac{(A \cdot E \cdot d) \cdot \Delta}{L}$$

$$= \frac{201,06 \cdot (200) \cdot 10^3 \cdot \delta}{300}$$

$$= 13404 \cdot \delta$$

$$\sigma_{\text{perunggu}} = \left(\frac{T \cdot L}{A_B} \right) \cdot \delta$$

$$T_{\text{perunggu}} = \left(\frac{A \cdot E \cdot S}{L} \right) \cdot \delta$$

$$= \frac{380 \cdot 13 \cdot 100 \cdot 10^3 \cdot \delta}{3000}$$

$$= 12671 \cdot \delta$$

$$\sigma_{\text{Baja}} + T_{\text{Perunggu}} = 75$$

$$2 \cdot (13404 \delta) + 12671 \cdot \delta = 75$$

$$26808 \delta + 12671 \delta = 75 \cdot 10^3$$

$$\delta = 1,89$$

$$\sigma_{\text{Baja}} = \frac{T_{\text{Baja}}}{A_{\text{Baja}}} = \frac{13404 (1,89)}{201,06} = 126 \text{ Mpa}$$

$$\sigma_{\text{perunggu}} = \frac{T_{\text{perunggu}}}{A_{\text{perunggu}}} = \frac{12671 (1,89)}{380,13} = 63 \text{ Mpa}$$

SOAL PERTEMUAN 4

NAMA : ALDAFI

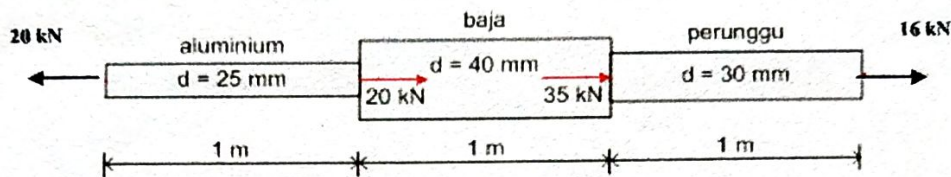
NIM : 182210040

MK : MEKANIKA TERAPAN

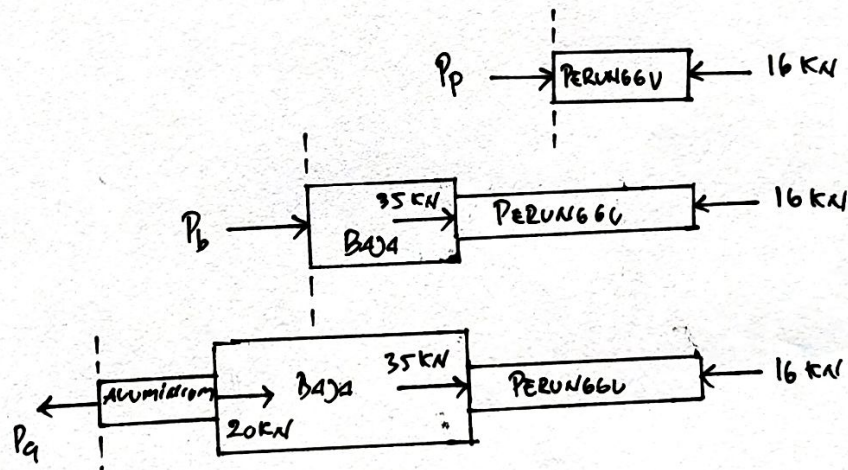
Dosen : Dr. FIRDAUS, MT

Soal

Suatu batang terdiri atas tiga material yaitu baja, aluminium dan perunggu yang dihubungkan secara kaku. Beban aksial bekerja pada kedudukan seperti diperlihatkan pada gambar. Penampang batang berbentuk lingkaran. Hitunglah tegangan pada setiap bahan!



JAWABAN



$$P_p - 25 = 0$$

$$P_p = 25 \text{ kN}$$

$$P_b + 35 - 16 = 0$$

$$P_b = -19 \text{ kN}$$

$$-P_a + 20 + 35 - 16 = 0$$

$$P_a = 39 \text{ kN}$$

$$A_p = \frac{1}{4} \pi (d_p)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi (d_b)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

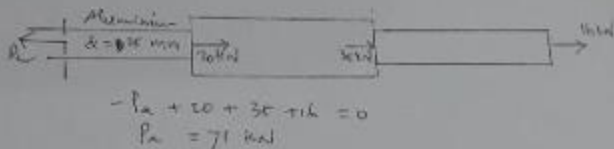
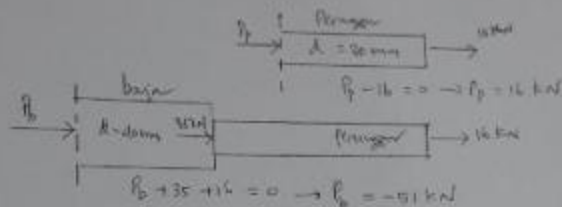
$$A_a = \frac{1}{4} \pi (d_a)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_p = \frac{P_p}{A_p} = \frac{25 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 35 \text{ Mpa}$$

$$\sigma_b = \frac{P_b}{A_b} = \frac{-19 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = -15 \text{ Mpa}$$

$$\sigma_a = \frac{P_a}{A_a} = \frac{39 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 79 \text{ Mpa}$$



$$A_p = \frac{1}{4} \pi d_p^2 = 0,25 \cdot 3,14 \cdot 30^2 = 706,5 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi d_b^2 = 0,25 \cdot 3,14 \cdot 40^2 = 1256 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi d_a^2 = 0,25 \cdot 3,14 \cdot 25^2 = 490,625 \text{ mm}^2$$

$$1) \sigma_p = \frac{16 \cdot 10^3}{706,5} = 22,65 \text{ MPa}$$

$$2) \sigma_b = \frac{-51 \cdot 10^3}{1256} = -40,60 \text{ MPa}$$

$$3) \sigma_a = \frac{71 \cdot 10^3}{490,625} = 144,71 \text{ MPa}$$

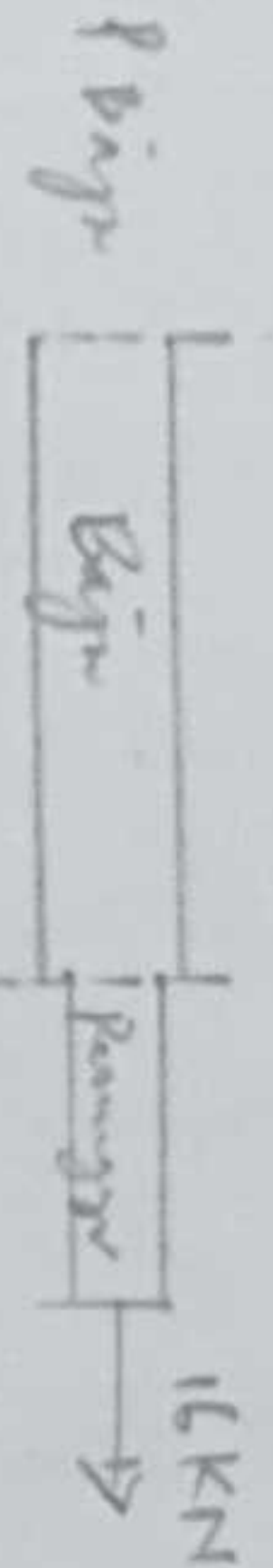
Nama : Ari Delta Putra

Nim : 1812110035

Soal 4 :



$$\uparrow P_{\text{pump}} + 16 = 0$$



$$\uparrow P_{\text{baja}} + 35 - 16 = 0$$



$$\uparrow P_{\text{aluminium}} + 20 + 35 + 16 = 0$$
$$P_A = 71$$

$$A_P = X_A \pi (80)^2 = X_A \pi (30)^2 = 707 \text{ mm}^2$$

$$A_B = X_A \pi (80)^2 = X_A \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_A = X_A \pi (80)^2 = X_A \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_P = \frac{P_P}{A_P} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ MPa}$$

$$\sigma = \frac{P_B}{A_B} = \frac{51 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 41 \text{ MPa}$$

$$\sigma_A = \frac{P_A}{A_A} = \frac{71 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 145 \text{ MPa}$$

$$\tau_{\text{baja}} = \left(\frac{A \cdot E \cdot \delta}{L} \right) \epsilon_{\text{baja}}$$

$$= \frac{201.06 (200) 10^3 \cdot \delta}{3000}$$
$$= 13404 \delta$$

$$\delta_{\text{perunggu}} = \left(\frac{T \cdot L}{AE} \right) P$$

$$\begin{aligned} T_{\text{Perunggu}} &= \left(\frac{A \cdot E \cdot \delta}{L} \right) \text{perunggu} \\ &= \frac{380 \cdot 13 \cdot 100 \cdot 10^3 \cdot \delta}{3000} \\ &= 12671 \delta \end{aligned}$$

$$\delta T_{\text{Baja}} + T_{\text{perunggu}} = 75$$

$$2 (13404 \delta) + (12671 \delta) = 75$$

$$26808 \delta + 12671 \delta = 75 \cdot 10^3$$

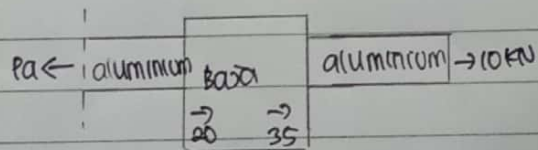
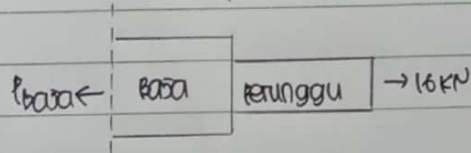
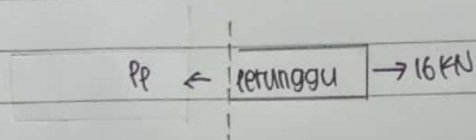
$$\delta = 1,89$$

$$\sigma_{\text{Baja}} = \frac{T_{\text{Baja}}}{A_{\text{Baja}}} = \frac{13404 (1,89)}{201,66} = 126 \text{ MPa}$$

$$\sigma_{\text{Perunggu}} = \frac{T_P}{A_P} = \frac{12671 \delta}{380,13} = \frac{12671 (1,89)}{380,13} = 63 \text{ MPa}$$

Nama : Deni Harison

NPM : 182710027

Soal tugas pertemuan 4 :

$$* -P_p + 16 = 0$$

$$P_p = 16$$

$$A_p = \frac{1}{4} \pi (d_p)^2 = \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$* -P_{base} + 35 - 16 = 0$$

$$-P_{base} + 19 = 0$$

$$P_{base} = 19$$

$$A_b = \frac{1}{4} \pi (d_b)^2 = \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$* -P_{aluminum} + 20 + 35 + 16 = 0$$

$$P_a = 71$$

$$A_a = \frac{1}{4} \pi (d_a)^2 = \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{P}{A}$$

$$\sigma_p = \frac{P_p}{A_p} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ MPa}$$

$$\sigma_b = \frac{P_b}{A_b} = \frac{19 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 15 \text{ MPa}$$

$$\sigma_a = \frac{P_a}{A_a} = \frac{71 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 145 \text{ MPa}$$

Date

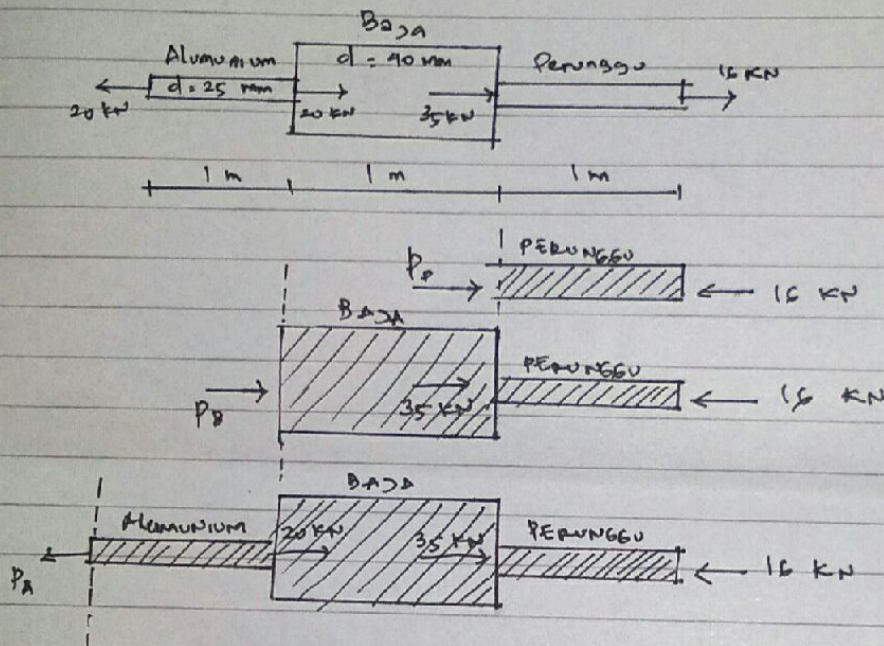
NAMA : DESMARITA, ST

NIM : 182710025

"MEKANIKA TERAPAN"

"TUGAS 4"

SUATU BATANG TERDIRI ATAS TIGA MATERIAL YAITU BAJA, ALUMINIUM, DAN PERUNGGU YANG DIHUBUNGAN SECARA KAKU. DEBAN AKSIAL BEKERJA PADA KEDUDUKAN SEPERTI DIPERLIHATKAN PADA GAMBAR. PENAMPANG BATANG BERBENTUK LINGKARAN. HITUNGLAH TEGANGAN PADA SETIAP BAHAN



Jwb

$$P_p - 16 = 0$$

$$P_p = 16 \text{ kN}$$

$$P_b + 35 - 16 = 0$$

$$P_b = -19 \text{ kN}$$

$$-P_a + 20 + 35 - 16 = 0$$

$$P_a = 39 \text{ kN}$$

$$A_p = \frac{1}{4} \pi (D_p)^2$$

$$= \frac{1}{4} \pi (30)^2 = 707 \text{ mm}^2$$

$$A_b = \frac{1}{4} \pi (D_b)^2$$

$$= \frac{1}{4} \pi (40)^2 = 1257 \text{ mm}^2$$

$$A_a = \frac{1}{4} \pi (D_a)^2$$

$$= \frac{1}{4} \pi (25)^2 = 491 \text{ mm}^2$$

$$\sigma = \frac{F}{A}$$

$$\sigma_p = \frac{P_p}{A_p} = \frac{16 \cdot 10^3 \text{ N}}{707 \text{ mm}^2} = 23 \text{ MPa}$$

$$\sigma_b = \frac{P_b}{A_b} = \frac{-19 \cdot 10^3 \text{ N}}{1257 \text{ mm}^2} = 15,11 \text{ MPa}$$

$$\sigma_a = \frac{P_a}{A_a} = \frac{39 \cdot 10^3 \text{ N}}{491 \text{ mm}^2} = 79,43 \text{ MPa}$$