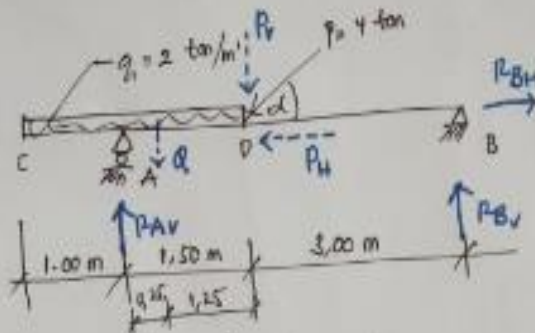


Jawaban Soal Tugas 1



Hitung : Gaya-gaya dalam (M, D, N) .

Jawab :

1). Mencari Reaksi Tumpuan .

① $\sum H = 0$

$$R_{BH} - P_H = 0$$

$$R_{BH} = P_H = P \cdot \cos 60^\circ = 4 \cdot 0,5 = 2 \text{ ton } (\rightarrow)$$

② $\sum M_B = 0$

$$R_{AV} \cdot 4,50 - (q \cdot 4,25) - (P_V \cdot 3) = 0$$

$$R_{AV} = \frac{(5 \times 4,25) + (3,464 \times 3)}{4,50} = \frac{(21,25 + 10,392)}{4,50} = 7,0316 \text{ ton } (\uparrow)$$

③ $\sum M_A = 0$

$$-(R_{BV} \cdot 4,50) + (P_V \cdot 1,50) + (q \cdot 0,25) = 0$$

$$R_{BV} = \frac{(3,464 \times 1,50) + (5 \times 0,25)}{4,50} = \frac{5,196 + 1,25}{4,50} = 1,4324 \text{ ton } (\uparrow)$$

Kontrol :

$$\sum V = 0$$

$$R_{AV} + R_{BV} - q - P_V = 0$$

$$7,0316 + 1,4324 = 5 + 3,464$$

$$8,464 = 8,464 \text{ (Oke!!)}$$

$$\alpha = 60^\circ$$

$$\sin 60^\circ = \frac{1}{2}\sqrt{3} = 0,866$$

$$\cos 60^\circ = 0,5$$

$$P_V = P \cdot \sin 60^\circ = 3,464 \text{ ton}$$

$$P_H = P \cdot \cos 60^\circ = 2 \text{ ton}$$

$$Q = q_1 \cdot l$$

$$= 2 \times 2,50$$

$$= 5,0 \text{ ton}$$

②. Mencari Gaya Lintang

$$D_C = 0$$

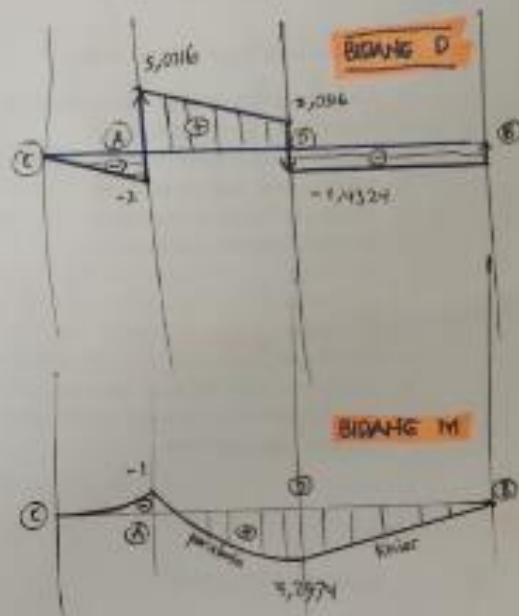
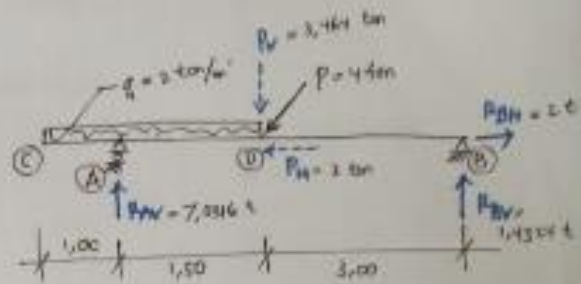
$$D_{A_{ki}} = -q_1 \cdot 1,00 = -2 \text{ ton}$$

$$D_{A_{kn}} = D_{A_{ki}} + R_{Av} \\ = -2 + 7,0316 = +5,0316 \text{ t}$$

$$D_{D_{ki}} = D_{A_{kn}} - (q_1 \cdot 1,50) \\ = 5,0316 - 3 \\ = 2,0316 \text{ ton}$$

$$D_{D_{kn}} = D_{D_{ki}} - P_v \\ = 2,0316 - 3,464 \\ = -1,4324 \text{ ton}$$

$$D_B = D_{D_{kn}} + R_{Bv} \\ = 0$$



③. Mencari Momen

$$M_C = 0 \text{ (ujung tumpu)}$$

$$M_B = 0 \text{ (ujung sandi)}$$

$$M_A = -(q_1 \cdot 1) \cdot 0,5 \\ = -2 \cdot 0,5 = -1 \text{ ton.m}$$

$$M_D = -(q_1 \cdot 2,50) \cdot (1/2 \cdot 2,50) + (R_{Av} \cdot 1,00) \\ = -(2 \cdot 2,50) \cdot 1,25 + (7,0316 \cdot 1,00) \\ = -6,25 + 7,0316 \\ = 0,7816 \text{ t.m}$$

④. Bidang Normal

$$H(C-D) = 0$$

$$H(D-B) = 2 \text{ ton (tarik)}$$

