



UDS

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Nombre de la materia: Estática en la
Arquitectura

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Cuatrimestre: 3 Cuatrimestre

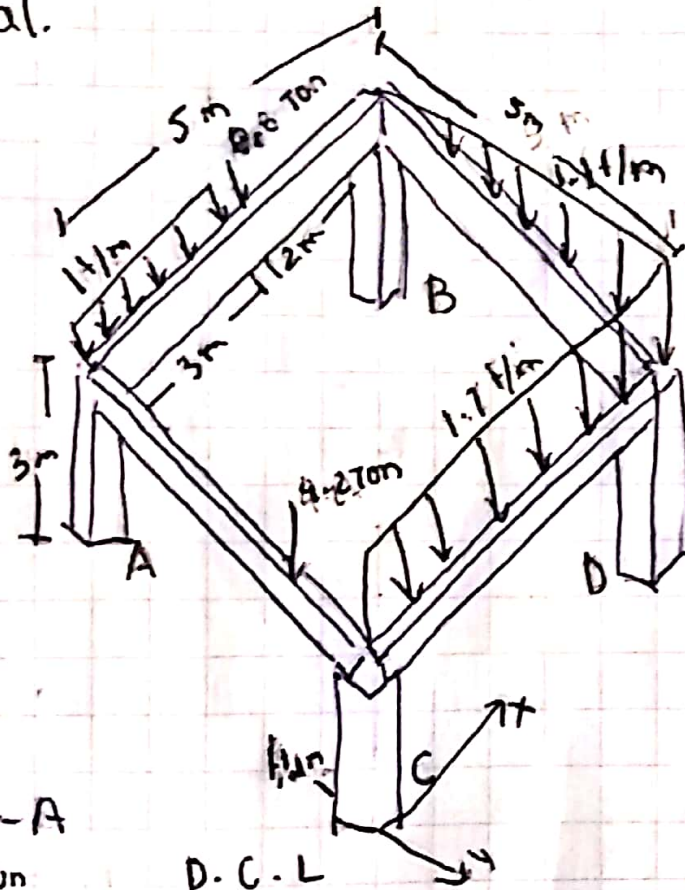
Proyecto: Examen

Carrera: Lic. Arquitectura

Fecha: 15/07/21

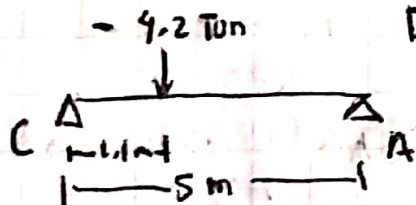
Examen de Estadística

Del siguiente isométrico formado por 4 marcos rígidos y con las cargas aplicadas a las traveses obtén las reacciones en los apoyos A, B, C y D de cada elemento.
 Nota: En cada apoyo descansan 2 traveses, por lo cual tendrá una sumatoria de esas traveses para obtener una reacción total.



A-B
 B-D
 C-D
 C-A

① Ejercicio C-A



$$\sum M = 0$$

$$\begin{aligned} &= (C(0) - (4.2T)(1.1m) + A(5m)) = 0 \\ &= 4.62 \text{ Tm} + A \cdot 5m = 0 \\ &A \cdot 5m = 4.62 \text{ Tm} \\ &A = \frac{4.62 \text{ Tm}}{5m} \\ &\underline{A = 0.924T} \end{aligned}$$

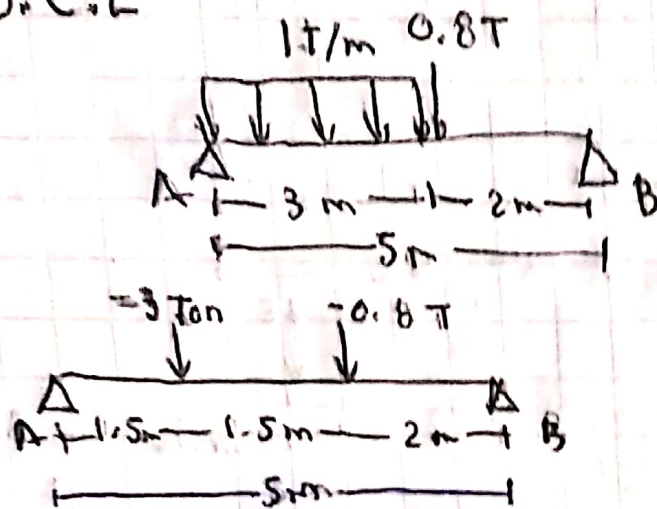
$$\begin{aligned} \sum F_y &= 0 \\ C + A - 4.2T &= 0 \\ C + 0.924T - 4.2T &= 0 \\ C - 3.276 &= 0 \\ \underline{C = 3.276 \text{ Ton}} \end{aligned}$$

Comprobación

$$\sum F_y = 0.924T + 3.276T - 4.2T = 0$$

② Ejercicio A-B

D.C.L



Carga distribuida
Rectangular

$$P = w \cdot L$$

$$w_p = L/2$$

$$P = (1t/m)(3m)$$

$$P = 3 \text{ Ton}$$

$$w_p = 3m/2$$

$$w_p = 1.5m$$

$$\sum M = 0$$

$$A(0) - 3\text{Ton}(1.5m) - 0.8T(3m) + B(5m) = 0$$

$$-4.5 \text{ tm} - 2.4 \text{ tm} + B5m = 0$$

$$-6.9 \text{ tm} + B5m = 0$$

$$B5m = 6.9 \text{ tonm}$$

$$B = \frac{6.9 \text{ tonm}}{5m}$$

$$B = 1.38 \text{ Ton}$$

Comprobación

$$\sum F_y = 0$$

$$A + B - 3\text{Ton} - 0.8\text{Ton} = 0$$

$$A + 1.38 \text{ Ton} - 3 \text{ Ton} - 0.8 \text{ Ton} = 0$$

$$A + 1.38 \text{ Ton} - 3.8 \text{ Ton} = 0$$

$$A - 2.42 \text{ Ton} = 0$$

$$A = 2.42 \text{ Ton}$$

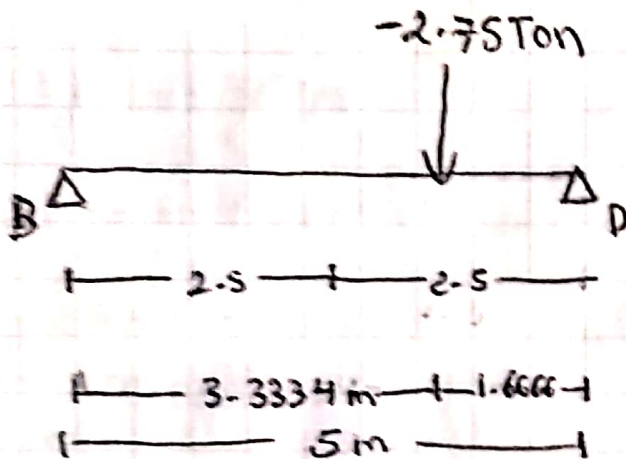
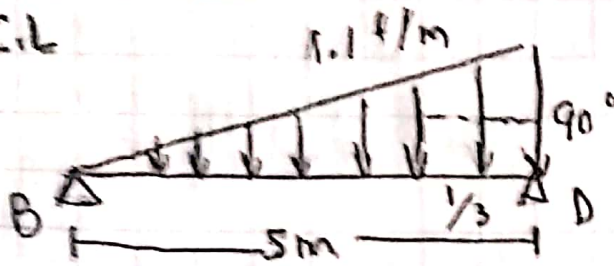
$$\sum F_y = 2.42 + 1.38 - 3 - 0.8 = 0$$

$$\sum 2.42 \text{ Ton} + 1.38 \text{ Ton} - 3 \text{ Ton} - 0.8 = 0$$

$$\sum F_y = 1.38 + 2.42 - 3 - 0.8$$

③ Ejercicio B-D

D.C.L



Carga distribuida triangular

$$p = (w \cdot L) / 2$$

$$u_p = 2/3 \cdot L (B)$$

$$u_p = 1/3 \cdot L (D)$$

$$P = 1.1 \text{ t/m} (5 \text{ m})$$

$$P = 5.5 \text{ Ton} / 2$$

$$P = 2.75 \text{ Ton}$$

$$u_p = \frac{1}{3} (5)$$

$$u_p = 5/3 \text{ m}$$

$$u_p = 1.6666 \text{ m}$$

$$\sum M = 0$$

$$B(0) - 2.75 \text{ Ton} (3.3334 \text{ m}) + D(5 \text{ m}) = 0$$

$$- 9.16685 \text{ tonm} + D5 \text{ m} = 0$$

$$D5 \text{ m} = 9.16685 \text{ tonm}$$

$$D = \frac{9.16685 \text{ tonm}}{5 \text{ m}}$$

$$D = 1.83337 \text{ Ton}$$

$$\sum F_f =$$

$$B - 2.75 \text{ Ton} + D = 0$$

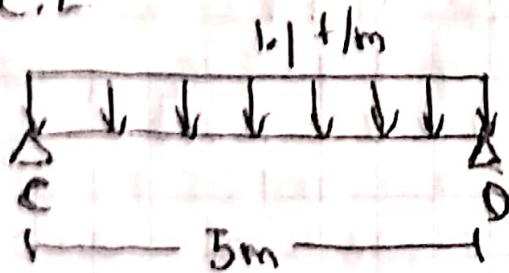
$$B - 2.75 \text{ Ton} + 1.83337 \text{ Ton}$$

$$B - 0.91663 \text{ Ton}$$

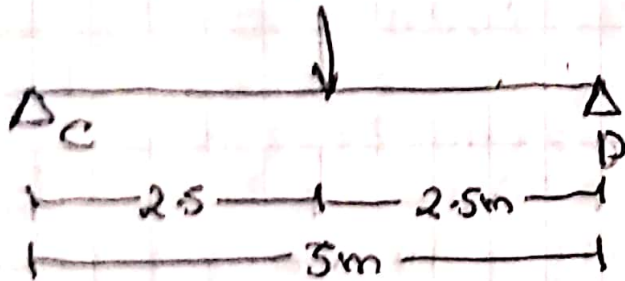
$$B = 0.91663 \text{ Ton}$$

④ Ejercicio c-d

D.C.L



-5.5 Ton



Carga distribuida
Rectangular

$$P = w \cdot L$$

$$w_p = L/2$$

$$P = 1.1 \text{ Ton/m} (5 \text{ m})$$

$$P = 5.5 \text{ ton}$$

$$w_p = 5/2$$

$$w_p = 2.5 \text{ m}$$

$$\sum M = 0$$

$$C - 5.5 \text{ Ton} (2.5 \text{ m}) + D (5 \text{ m}) = 0$$

$$- 13.75 \text{ Tonm} + D 5 \text{ m} = 0$$

$$D 5 \text{ m} = 13.75 \text{ Tonm}$$

$$D = \frac{13.75 \text{ Tonm}}{5 \text{ m}}$$

$$D = 2.75 \text{ Ton}$$

$$\sum F_y = 0$$

$$C + D - 5.5 \text{ Ton}$$

$$C + 2.75 \text{ Ton} - 5.5 \text{ Ton} = 0$$

$$C - 2.75 = 0$$

$$C = 2.75 \text{ Ton} = 0$$

Sumatoria de cada apoyo

$$\Sigma A_y = 2.42 \text{ Ton} + 0.924 \text{ Ton}$$

$$\Sigma A_y = 3.344 \text{ Ton}$$

$$\Sigma B_y = 1.38 \text{ Ton} + 0.91663 \text{ Ton}$$

$$\Sigma B_y = 2.29663 \text{ Ton}$$

$$\Sigma D_y = 2.75 \text{ Ton} + 1.83337 \text{ Ton}$$

$$\Sigma D_y = 4.58337 \text{ Ton}$$

$$\Sigma C_y = 2.75 \text{ Ton} + 3.276 \text{ Ton}$$

$$\Sigma C_y = 6.026 \text{ Ton}$$