

ESERCITAZIONE 5: STATO

ESERCIZIO 1: EQUAZIONI ORIGINALI AND STATICS

1) $\sum \vec{F} = 0 \rightarrow 2 \text{ equations (x,y)}$

$$\sum \vec{F}_i + \sum \vec{R}_i = 0$$

EQUILIBRIUM AND FLUCTUATIONS

1 equation $\sum \vec{R}_i = 0$

$$\sum (r_i - d) \cdot \vec{F}_i + \sum \vec{C}_i + \sum (R_i - d) \cdot \vec{R}_i + \sum \vec{C}_i$$

NON ACCOUNTED TO P/C APPLIED AT CORNER B (ACTIVE) P/C AT CORNER B (PASSIVE)



MEMBERS OF THE FRAME

$$\vec{R} = (r-d) \cdot \vec{F} = (r-d) \cdot (u-d) \cdot \vec{F} = (r-d) \cdot \vec{F} + (u-d) \cdot \vec{F}$$



- ATOMIC REACTION (a)
- ATOMIC TO FRAME (r)
- MEMBER ELEMENTS (u)



CONSIDER IN RCB CORNER 2 \rightarrow DO

- 1) CALCULATE REACTION FORCES
- 2) CALCULATE MEMBER ELEMENT REACTION

$$N^{\circ} \text{ CORN} = 2$$

$$N^{\circ} \text{ MBR} = 2 \times 3 = 6$$

$$N^{\circ} \text{ EQU} = 3 \text{ CORNERS (1)} + 3 \text{ CORNERS (2)} + 1 \text{ CORNER (3)} = 6$$

$$N^{\circ} \text{ EQU} = 0$$



1) $\sum F_x = 0 \rightarrow -F + R_x = 0 \rightarrow R_x = F$

2) $\sum F_y = 0 \rightarrow V_A - V_B = 0 \rightarrow V_A = V_B$

3) $\sum M_A = 0 \rightarrow V_B \cdot 2L + F \cdot L = 0 \rightarrow V_B = -\frac{F}{2}$

$V_A = -V_B \rightarrow V_A = \frac{F}{2}$

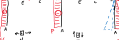
1) $\sum F_x = 0 \rightarrow -F + R_x = 0 \rightarrow R_x = F$

2) $\sum F_y = 0 \rightarrow V_A - V_B = 0 \rightarrow V_A = V_B$

3) $\sum M_A = 0 \rightarrow R_x \cdot 2L - V_B \cdot L = 0 \rightarrow R_x = -2F$

2) ABOVE INTERIOR

$$\left(\frac{F}{2} \right)^T \quad \left(\frac{F}{2} \right)^T$$



1) $\sum F_x = 0 \rightarrow -H = 0 \rightarrow H = 0$

2) $\sum F_y = 0 \rightarrow V_A + T = 0 \rightarrow T = -\frac{E}{L}$

3) $\sum M_A = 0 \rightarrow -H \cdot V_A \cdot x = 0 \rightarrow H(x) = V_A \cdot x = \frac{F}{2} \cdot x$

$H(x=L) = -\frac{FL}{2}$

THAT BE

1) $\sum F_x = 0 \rightarrow -F + T = 0 \rightarrow T = F$

2) $\sum F_y = 0 \rightarrow N = 0$

3) $\sum M_A = 0 \rightarrow H + F \cdot x = 0 \rightarrow H(x) = -Fx$

$H(x=L) = -FL$

THAT BE

1) $\sum F_x = 0 \rightarrow R_A + H = 0 \rightarrow R_A = -F$

2) $\sum F_y = 0 \rightarrow V_A - T = 0 \rightarrow T = \frac{F}{2}$

3) $\sum M_A = 0 \rightarrow -V_A \cdot x + H = 0 \rightarrow H(x) = \frac{F}{2} \cdot x$

$H(x=L) = \frac{FL}{2}$

1) $\sum F_x = 0 \rightarrow T + V_A = 0 \rightarrow T = -H_A = -F$

2) $\sum F_y = 0 \rightarrow V_A + H = 0 \rightarrow H = -\frac{F}{2}$

3) $\sum M_A = 0 \rightarrow -H \cdot R_A + R_A \cdot x = 0 \rightarrow H(x) = R_A \cdot x = -2FL + Fx$

$H(x=L) = 0$

$H(0) = R_A = -2FL$

ESERCIZIO 2



1) REACTION AND CORNERS

2) ABOVE INTERIOR

$$N^{\circ} \text{ CORN} = 2$$

$$N^{\circ} \text{ MBR} = 2 \times 3 = 6$$

$$N^{\circ} \text{ EQU} = 3 \text{ CORNERS (1)} + 3 \text{ CORNERS (2)} = 6$$

$$N^{\circ} \text{ EQU} = 0$$

1) $\sum M_A = 0 \rightarrow \frac{F \cdot L}{2} - R_A \cdot 2L = 0 \rightarrow R_A = \frac{F}{4}$

2) $\sum F_x = 0 \rightarrow R_A - H_A - F = 0 \rightarrow H_A = \frac{F}{4}$

3) $\sum F_y = 0 \rightarrow V_A + V_B = 0$

$V_A = -V_B = \frac{F}{4}$

1) $\sum F_x = 0 \rightarrow H_A + R_A - F = 0 \rightarrow R_A = \frac{F}{4}$

2) $\sum F_y = 0 \rightarrow V_A - V_B = 0 \rightarrow V_A = V_B$

3) $\sum M_A = 0 \rightarrow V_B \cdot L - H_A \cdot L = 0 \rightarrow V_B = \frac{F}{4}$

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