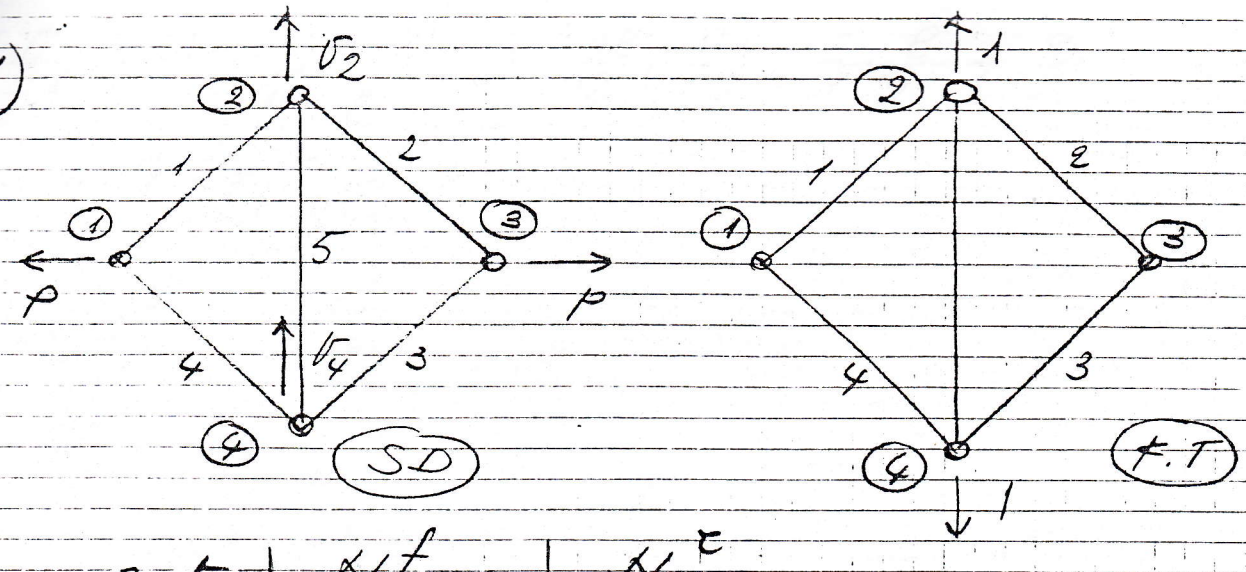
1)



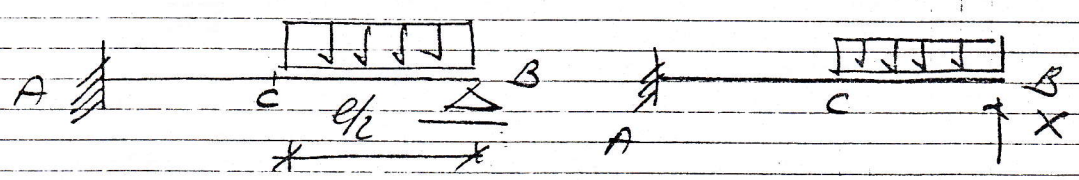
asta	N_i^f	N_i^c
1	0	$\sqrt{2}/2\ P$
2	0	$\sqrt{2}/2\ P$
3	0	$\sqrt{2}/2\ P$
4	0	$\sqrt{2}/2\ P$
5	1	$-P$

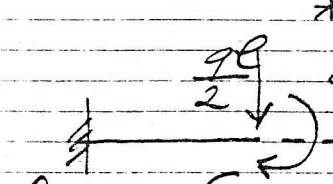
$$\Delta v_c = 1 \cdot v_2 - 1 \cdot v_4 = 1 \cdot \Delta u_{2,4} = \Delta v_i = \frac{1}{EA} \sum_{i=1}^{5} N_i^f N_i^c \ell_i$$

$$= \frac{1}{EA}(1)(-P)\ell\sqrt{2} = -\frac{P\ell\sqrt{2}}{EA} = \Delta v_{2,4}$$

Essendo $\Delta v_{2,4} < 0 \rightarrow v_4 > v_2 \rightarrow$ accorciamento dell'asta 5:

2)





$$v_C(q) = \frac{q\ell}{2}\left(\frac{\ell}{2}\right)^3 \frac{1}{3EJ} + \frac{q\ell^2}{8}\left(\frac{\ell}{2}\right)^2 \frac{1}{2EJ} =$$

$$= \frac{q\ell^4}{48EJ} + \frac{q\ell^4}{64EJ} = \frac{(4+3)}{192} q\ell^4 = \frac{7}{192} q\ell^4$$