Università di Pisa
Esame di SCIENZA DELLE COSTRUZIONI I
Corso di Laurea in Ingegneria Civile, Ambientale e Edile

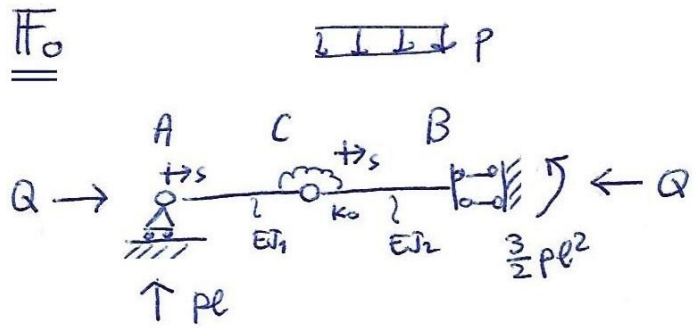
(Docenti: Prof. Ing. Stefano Bennati; Prof. Ing. Riccardo Barsotti)

ù

Prova scritta (telematica) del 24 febbraio 2021 – Sintesi soluzione

PROBLEMA 1

F_0

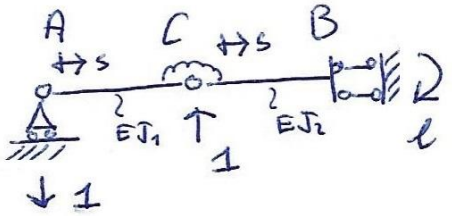


$N_{AC} = -Q$ $\quad N_{CB} = -Q$

$T_{AC} = pl$ $\quad T_{CB} = pl - ps$

$M_{AC} = pls$ $\quad M_{CB} = pl(l+s) - \frac{ps^2}{2}$

F_1



$N_{AC} = 0$ $\quad N_{CB} = 0$

$T_{AC} = -1$ $\quad T_{CB} = 0$

$M_{AC} = -s$ $\quad M_{CB} = -l$

con: $\eta_1 = \eta_{10} + X_1 \cdot \eta_{11} = -\frac{X_1}{k_1} + \delta$

$$\eta_{10} + l \cdot \frac{pl^2}{k_0} = \int_{AC} \frac{M^{(0)}M^{(1)}}{EJ_1} + \int_{CB} \frac{M^{(0)}M^{(1)}}{EJ_2} = -\frac{pl^4}{3EJ_1} - \frac{4pl^4}{3EJ_2}$$

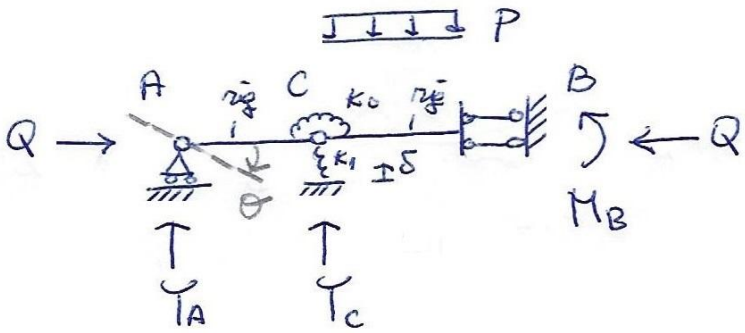
$$\eta_{11} - l \cdot \frac{l}{k_0} = \int_{AC} \frac{M^{(1)}M^{(1)}}{EJ_1} + \int_{CB} \frac{M^{(1)}M^{(1)}}{EJ_2} = \frac{l^3}{3EJ_1} + \frac{l^3}{EJ_2}$$

PROBLEMA 2

$$Y_A = pl - k_1(l\theta + \delta)$$

$$Y_C = k_1(l\theta + \delta)$$

$$M_B = \frac{3}{2}pl^2 - k_1 l(l\theta + \delta)$$



EQ. ROT. "AC": $k_0\theta - l[pl - k_1(l\theta + \delta)] = 0$ da cui: $\theta = \frac{pl^2 - k_1 l\delta}{k_0 + k_1 l^2}$