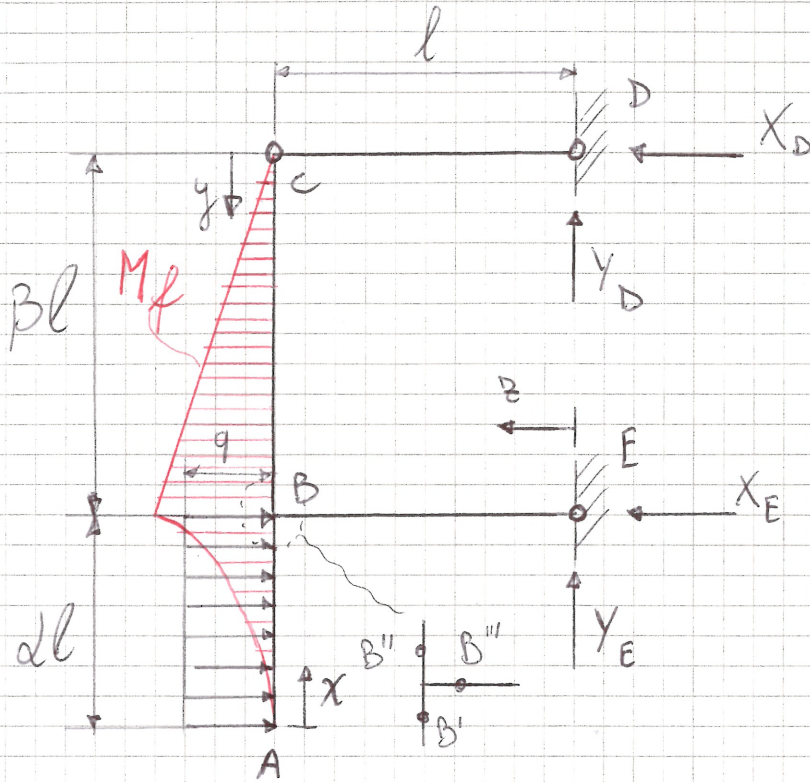


Compito del 14/02/2023. Esercizio 1.



La struttura è isostatica ( $2 \cdot 3 = 6 = 2 + 2 + 2$ )

Calcolo le reazioni vincolari.

$$\rightarrow + ] -X_D - X_E + q \cdot dl = 0 \rightarrow X_E = \frac{2\alpha\beta + d^2}{2\beta} q \cdot l$$

$$\uparrow + ] Y_E + Y_D = 0 \rightarrow Y_E = 0$$

$$+\curvearrowright ] q \cdot dl \cdot \left(\frac{dl}{2}\right) + X_D \cdot \beta l = 0 \rightarrow X_D = -\frac{d^2}{2\beta} q \cdot l$$

Nota che CD è una biella e quindi:

$$Y_D = 0$$

Calcolo lo sforzo normale su CD e BE

$$N_{CD} = -X_D = \frac{d^2}{2\beta} q \cdot l ; \quad N_{BE} = -X_E = -\frac{2\alpha\beta + d^2}{2\beta} q \cdot l$$

$$\{r_{01}\} = -\frac{d^2}{2\beta} ; \quad \{r_{02}\} = 0 ; \quad \{r_{03}\} = \frac{2\alpha\beta + d^2}{2\beta} ; \quad \{r_{04}\} = 0 ;$$

$$\{r_{05}\} = \frac{d^2}{2\beta} ; \quad \{r_{06}\} = -\frac{2\alpha\beta + d^2}{2\beta} .$$



Momenti flettenti su AB, CB e EB.

$$M_{fAB}(x) = +q \cdot \frac{x^2}{2}$$

$$M_{fCB}(y) = -X_D \cdot y = \frac{d^2}{2\beta} \cdot q \cdot l \cdot y$$

$$M_{fEB}(z) = -Y_E \cdot z = 0$$

$$\{z_{07}\} = 0 ; \{z_{08}\} = \frac{1}{2} ; \{z_{09}\} = 0 ;$$

$$\{z_{10}\} = \frac{d^2}{2\beta} ; \{z_{11}\} = 0 ; \{z_{12}\} = 0 ;$$

$$\{z_{13}\} = 0 ; \{z_{14}\} = 0 ; \{z_{15}\} = 0 .$$

$$M_{f,B'} = M_{fAB}(\alpha l) = q \cdot \frac{d^2}{2} l^2$$

$$M_{f,B''} = M_{fCB}(\beta l) = \frac{d^2}{2\beta} \cdot q \cdot l \cdot \beta l$$

$$M_{f,B'''} = M_{fEB}(l) = 0$$

$$\{z_{16}\} = \frac{d^2}{2} ; \{z_{17}\} = \frac{d^2}{2} ; \{z_{18}\} = 0$$