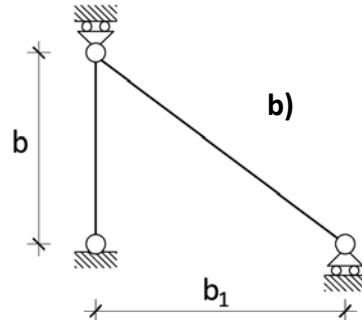
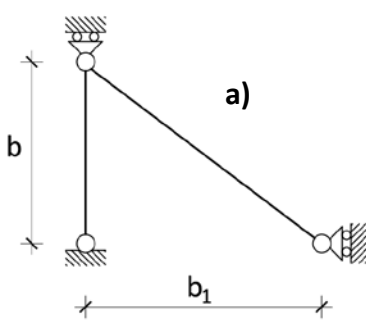
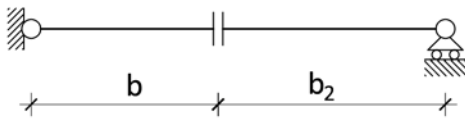


Exercise 2

STUDENT IDENTIFICATION NUMBER: _ _ _ _ _

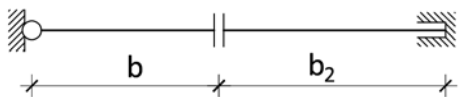


$$b_1 = n_1 \cdot b \quad \text{with} \quad n_1 = \frac{20 - e}{10}$$



c)

$$b_2 = n_2 \cdot b \quad \text{with} \quad n_2 = \frac{11 + f}{10}$$



d)

Consider the structures sketched above, composed by slender elements having axial stiffness EA and bending stiffness EI , where e and f coincide with the corresponding digits of your student id number.

For each configuration:

- build up the stiffness matrices relevant to the structure;
- determine the rank of the whole matrix;
- individuate the reduced form of the matrix and the corresponding rank;
- identify the possible rigid body motion, if any, and sketch the corresponding graphical representation.

Solve the exercise and deliver the required results only by fully compiling the next pages 2 and 3.

The delivery must follow the instructions contained in the document "Delivery Deadlines" published in WeBeep.

Exercise 2 - SOLUTION

SURNAME:

STUDENT IDENTIFICATION NUMBER:
a b c d e f

NAME:

PERSON CODE:

$n_1 =$

$n_2 =$

STRUCTURES a) and b)

WHOLE STIFFNESS MATRIX – matrix rank =

CONFIGURATION a)

REDUCED STIFFNESS MATRIX – matrix rank =

possible rigid body motions (y/n) =
numerical and graphical representation of the
rigid body motion, if any

CONFIGURATION b)

REDUCED STIFFNESS MATRIX – matrix rank =

possible rigid body motions (y/n) =
numerical and graphical representation of the
rigid body motion, if any

STRUCTURES c) and d)

WHOLE STIFFNESS MATRIX – matrix rank =

CONFIGURATION c)

REDUCED STIFFNESS MATRIX – matrix rank =

possible rigid body motions (y/n) =
numerical and graphical representation of the
rigid body motion, if any

CONFIGURATION d)

REDUCED STIFFNESS MATRIX – matrix rank =

possible rigid body motions (y/n) =
numerical and graphical representation of the
rigid body motion, if any