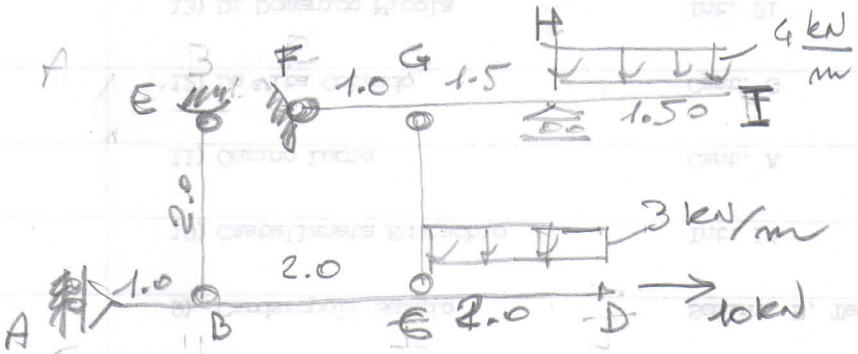
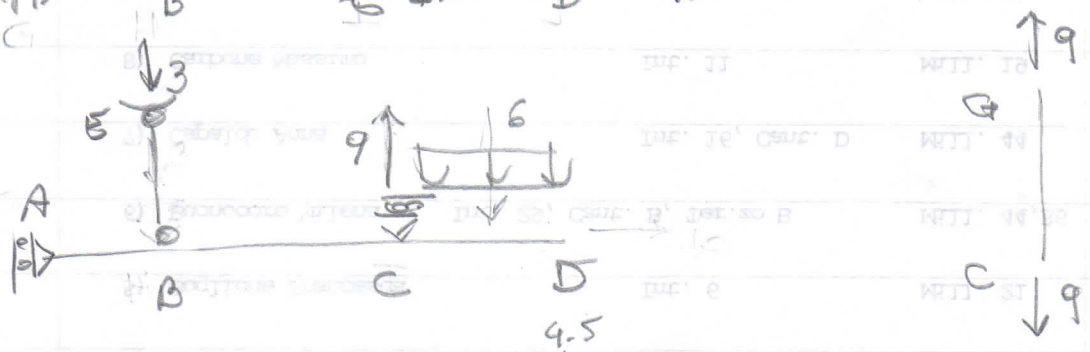
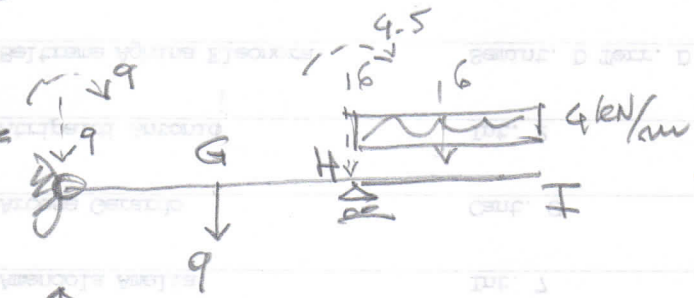
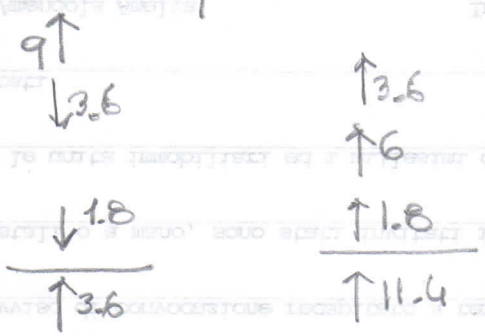
ES. 1

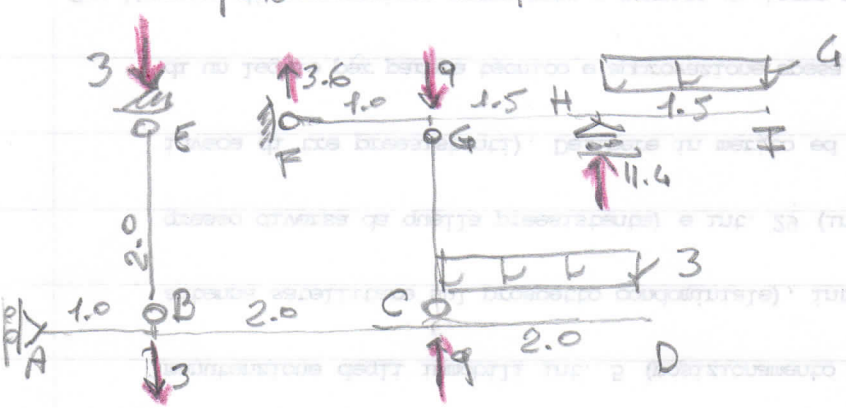

H
4 kN/m
E
F
G
1.0
1.5
1.50
I
2.0
3 kN/m
A
1.0
2.0
B
C
2.0
D
10kN

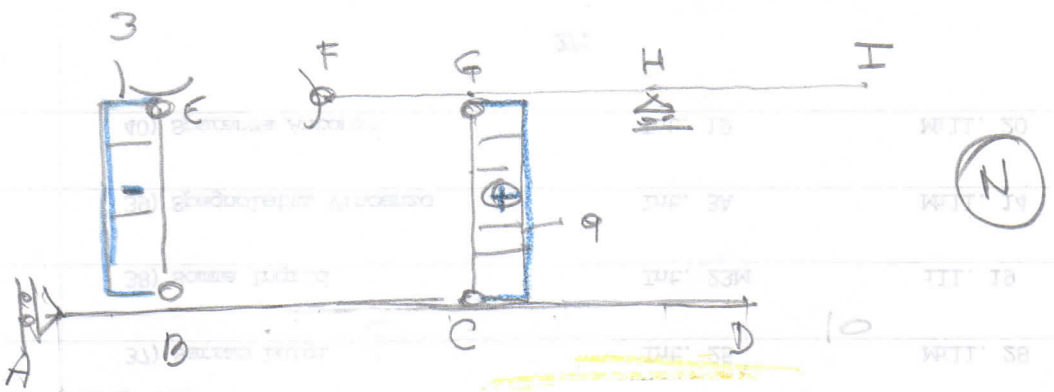

3
E
9
6
A
B
C
D
9
G
C
9

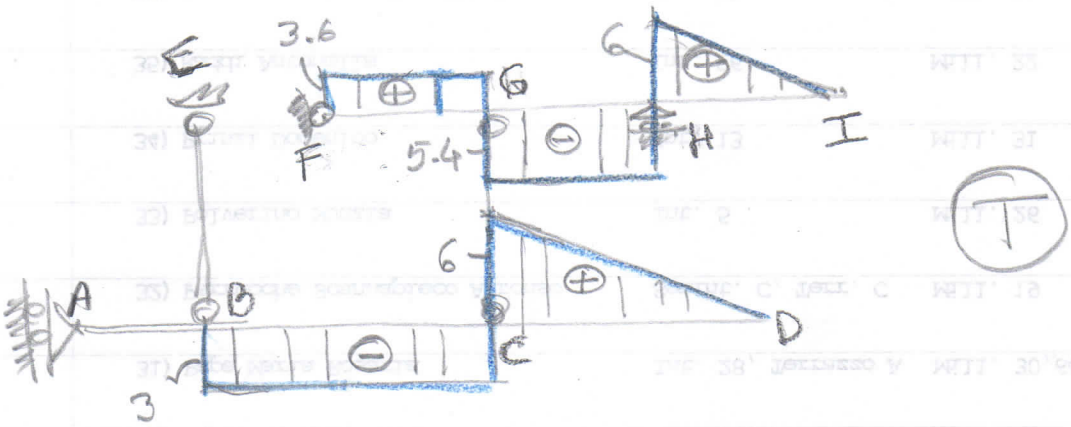

4.5
9
1.6
1.6
4 kN/m
F
9
G
H
I
9

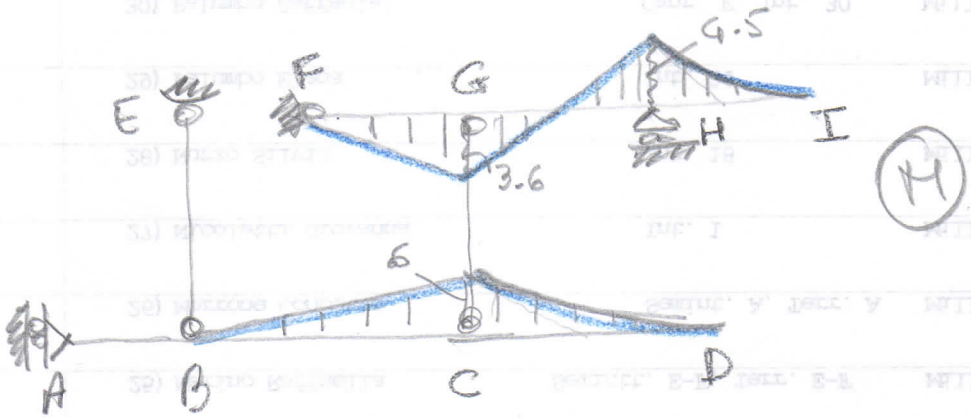

9
3.6
1.8
3.6

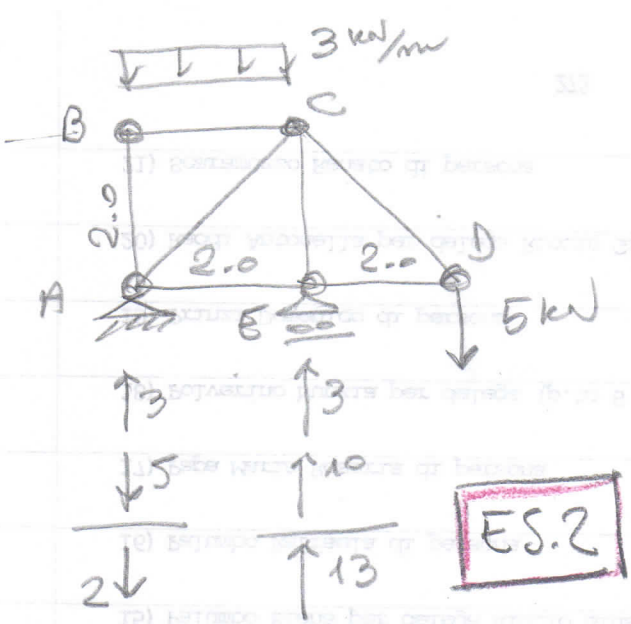
3.6
6
1.8
11.4


3
3.6
9
1.0
1.5
H
1.5
G
E
F
G
I
11.4
2.0
3
1.0
B
2.0
C
2.0
D
A
3
9

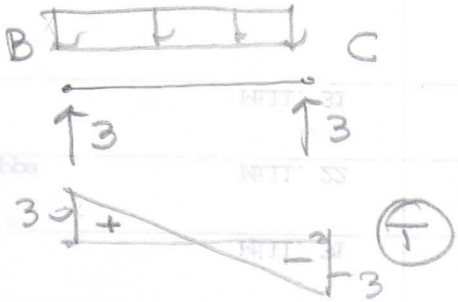

3
E
F
G
H
I
9
A
B
C
D
N

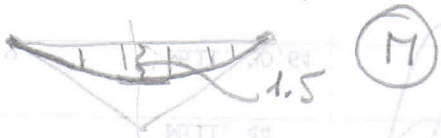

E
3.6
G
F
5.4
H
I
6
A
B
C
D
3
T

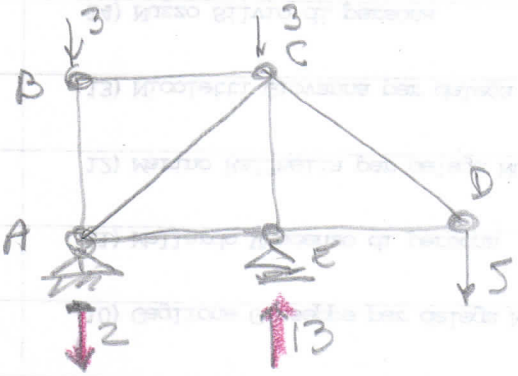

E
F
G
6.5
H
I
3.6
6
A
B
C
D
M



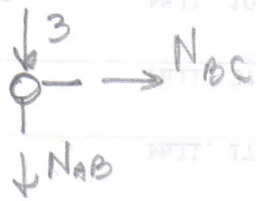
ES.2







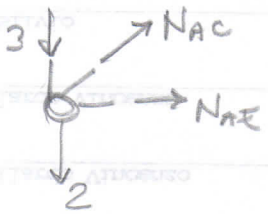
1) Nodo B

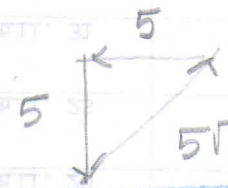


$N_{BC} = 0$

$N_{AB} = -3$

2) Nodo A

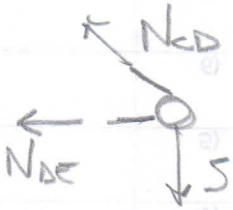


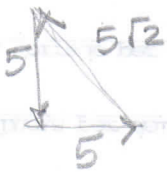


$N_{AC} = 5\sqrt{2} = 7.07$

$N_{AE} = -5$

3) Nodo D

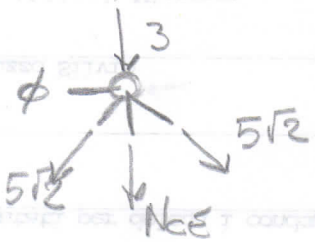




$N_{CD} = 5\sqrt{2}$

$N_{DE} = -5$

4) Nodo C



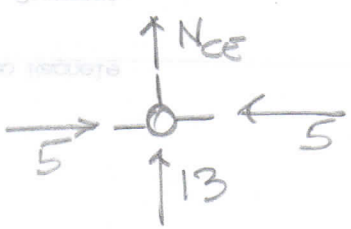
$3 + 5\sqrt{2}\cdot\frac{\sqrt{2}}{2}\cdot 2 + N_{CE} = 0$

$13 + N_{CE} = 0$

$N_{CE} = -13$

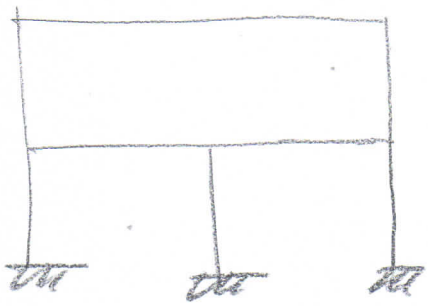
oppure:

4) Nodo E

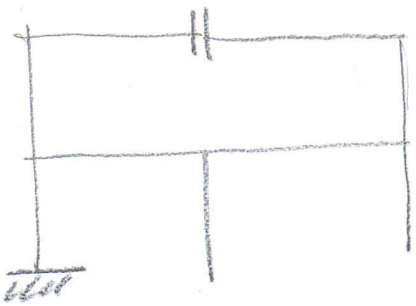


$N_{CE} = -13$

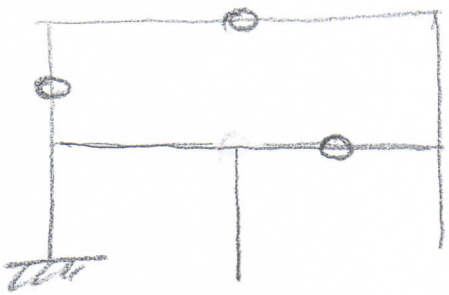
ES.3



9 ip (3 int + 6 est)

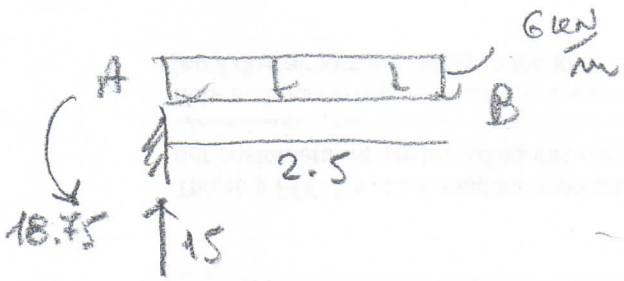


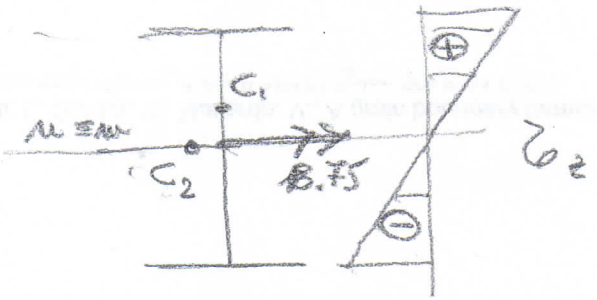
IS



IS

ES.4





$M_A = 18.75$ kNm

Tende fibre superiori

$$\sigma_2^{max} = \frac{18.75 \times 10^6}{1317 \times 10^4} \times 90 = 128 \frac{N}{mm^2}$$

$$GC_1 = \frac{1317}{23.95} \frac{1}{9} = 6.1 \text{ cm}$$

$$GC_2 = \frac{100.9}{23.95} \frac{1}{4.55} = 0.9 \text{ cm}$$