Ministry of Higher Education
Giza Higher Institute of Engineering & Technology
Civil Engineering Department
Course Name: **Theory of Structures (2)A**
Course Code : **CIV 211** Date : **29 / 12 / 2019**

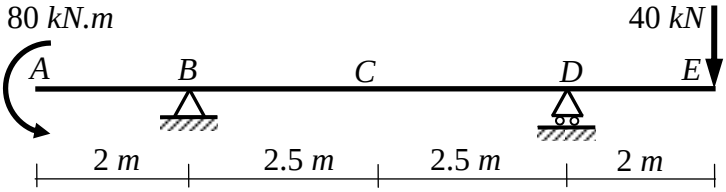
Academic Year : **2019/2020**
Semester : **First**
Level : **2 Civil**
Time : 3 **Hours**
Examiner**:** ***Dr. M. Abdel-Kader***

Final Exam

Total Marks**: 70** No. of Questions**: 5**

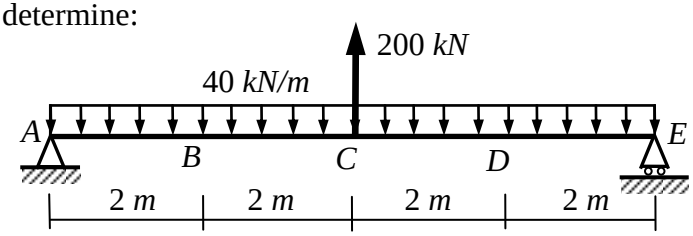
Question (1): (14 Marks)

For the shown beam, using the **double integration method**, determine:
(a) the deflections at ***A***, ***C*** and ***E***
(b) the slopes at ***A*** and ***C***
and sketch the elastic curve of the beam.
$EI = 5\times10^4\ kN.m^2$



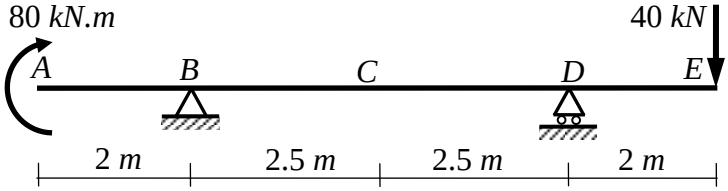
Question (2): (14 Marks)

For the shown beam, using the **moment-area method**, determine:
(a) the slope at ***A***
(b) the deflections at ***B*** and ***C***
and sketch the elastic curve of the beam.
$EI = 1\times10^4\ kN.m^2$



Question (3): (14 Marks)

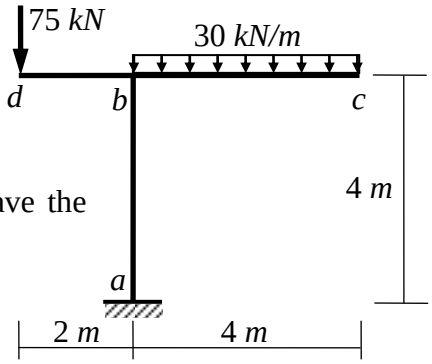
For the shown beam, using the **conjugate beam method**, determine:
(a) the deflections at ***A***, ***C*** and ***E***
(b) the slopes at ***A*** and ***C***
and sketch the elastic curve of the beam.
$EI = 5\times10^4\ kN.m^2$

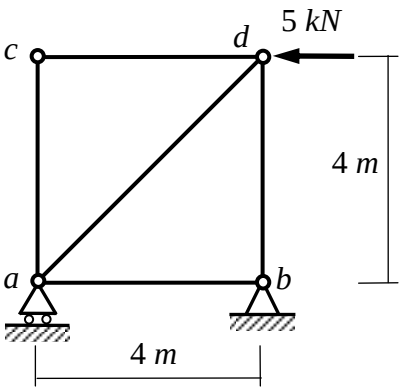


Question (4): (14 Marks)

For the shown frame and truss, using the **virtual work method**, determine the vertical displacement at *d* (δ_{dv}).

For the frame, assume $EI=20\times10^3\ kN.m^2$.
For the truss, assume that all members have the same axial rigidity $EA=1000\ kN$.

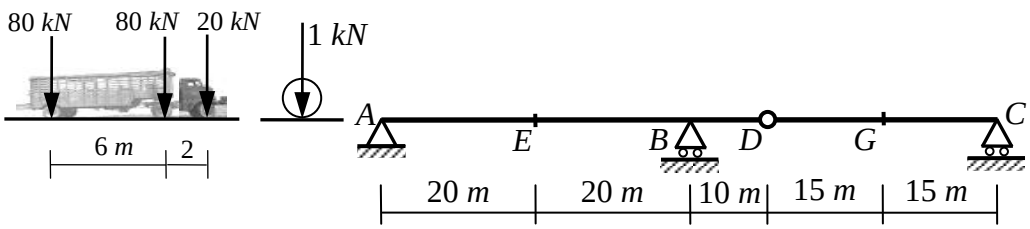




Question (5): (14 Marks)

For the shown beam, draw the influence line for:
(a) the reactions A_y, B_y and C_y.
(b) the shear force at the section *E* and the bending moments at the sections *E* and *G*.

Also, determine the maximum moment at *G* caused by the shown moving truck.



With my best wishes
Dr. M. Abdel-Kader