Ministry of Higher Education
Giza Higher Institute for Eng. & Tech.
Civil Engineering Department
Course Name: **Theory of Structures (3)**
Course Code : **CIV 301**

Academic Year : **2016-2017**
Semester : **First**
Level : **3rd**
Time : **3 Hours**
Date : **17 / 1 / 2017**
Examiner: ***Dr. M. Abdel-Kader***

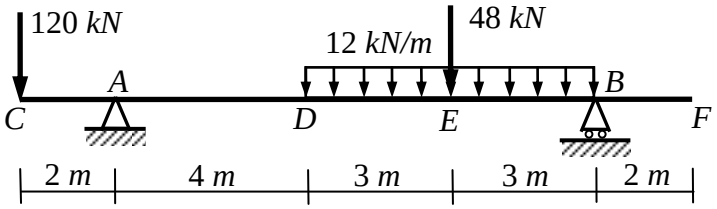
Final Exam

- Attempt all questions.
- The Exam consists of **5** questions in **1** page.
- Maximum grade is **60 Marks**

Question (1): (12 Marks)

For the shown beam, using the **double integration method**, determine: the deflections at ***C***, ***D*** and ***F*** and the slope at ***C.*** Also, sketch the elastic curve of the beam.

$EI = 2\times10^5\ kN.m^2$



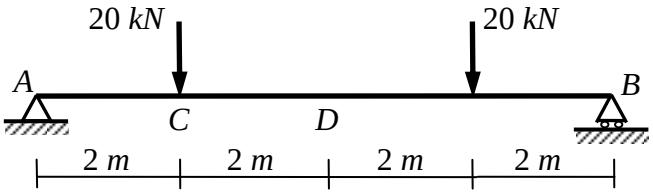
Question (2): (12 Marks)

For the shown beam, using the **moment-area method,** determine:

(a) the slope at ***A***
(b) the deflection at ***D***
(c) the deflection at ***C***

and sketch the elastic curve of the beam.

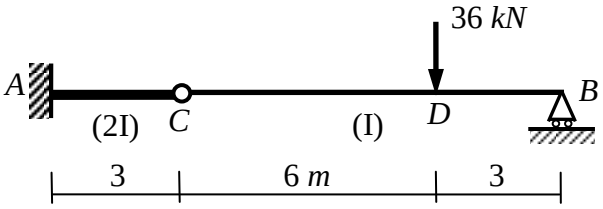
$E = 400\ GPa$ and $I = 1300\ cm^4$



Question (3): (12 Marks)

For the shown beam of variable cross-section (the relative moments of inertia are given between brackets), using the **conjugate beam method**, determine the slope at ***B*** and the deflections at ***C*** and ***D.*** Also, sketch the elastic curve of the beam.

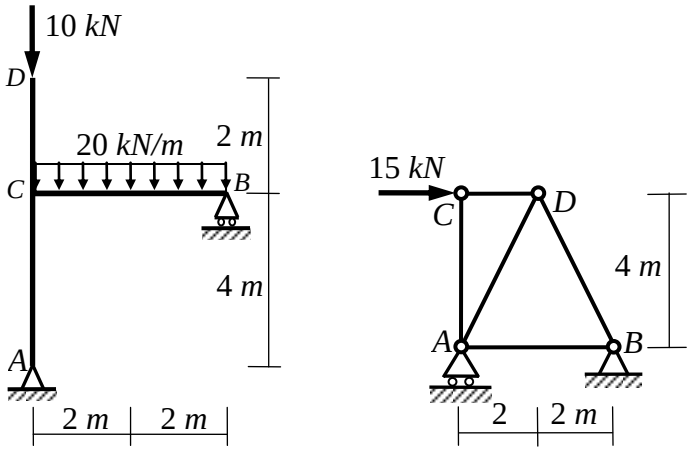
$EI = 20\times10^3\ kN.m^2$



Question (4): (12 Marks)

For the shown frame and truss, using the **virtual work method**, determine the horizontal displacements at ***D*** (δ_{Dh}).

For the frame, $EI = 50\times10^3\ kN.m^2$.
For the truss, assume that all members have the same axial rigidity $EA = 10000\ kN$.

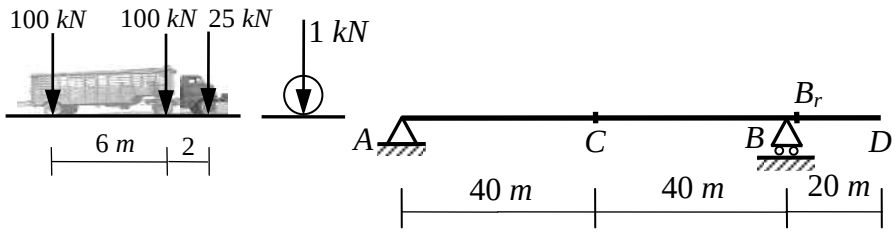


Question (5): (12 Marks)

For the shown beam, draw the influence lines for:

(a) the reactions A_y and B_y
(b) the shear forces at ***C*** and B_r
(c) the bending moment at ***C***

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



With my best wishes
Dr. M. Abdel-Kader