CE383 STRUCTURAL ANALYSIS

SPRING 2015

HOMEWORK 4

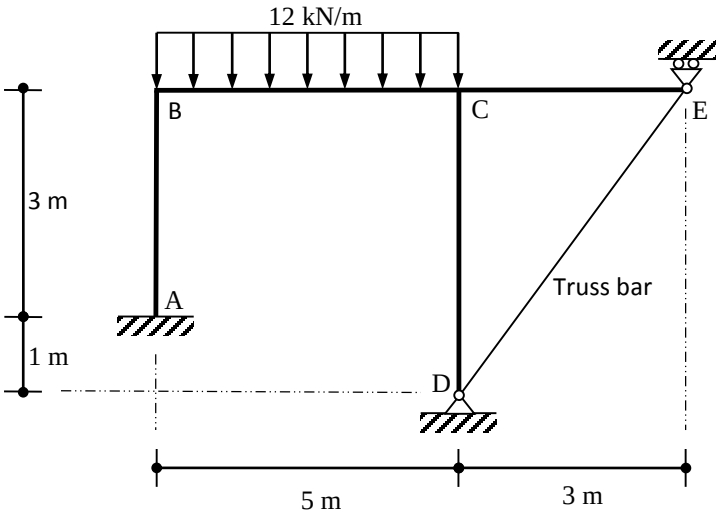
DUE: 02.06.2015 (Before the start of Final Exam)

LATE SUBMISSIONS WILL NOT BE ACCEPTED

Q1) Given structure is composed of rigidly connected frame members **AB**, **BC**, **CD** and **CE** that are axially rigid and with EI = 3000 kN-m^2, and truss member **DE** with $EA = 3000$ kN.

a) Calculate all support reactions, force in truss bar and check for global equilibrium of the structure by using stiffness method of analysis.

b) Plot axial force, shear force and bending moment diagrams of the entire structure. Clearly show your sign convention and indicate all critical values on the plots.



Q2) For given truss, E = 200 GPa for all bars, and cross sectional areas of each bar is given as follows: $A_{ab} = A_{bc}$ = 1000 mm^2 and A_{bd} = 500 mm^2. Use stiffness method of analysis.

a) Calculate the displacements at **b**; b) Calculate the bar forces; c) Check joint equilibrium at **b**.