Civil Engineering Department

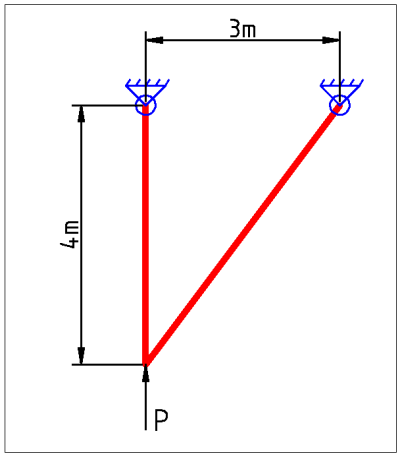
Guru Nanak Dev Engineering College, Ludhiana

M.Tech 1st year **MTST-602 Finite Element Methods**

Date: Tue 15 Sep 15 1st House Test Time: 10:30 a.m. to 12:00 noon Max. Marks 30

Don't write anything on question paper except your Roll No. _____

1(a)	Name any five software which make use of Finite Element Method in their solver. Write down features and limitations of any one.	4
1(b)	Write down steps involved in Finite Element Method.	6
2	Determine displacement (of truss shown below) in vertical direction at lower node and the axial force in each element, using Direct Stiffness Method of Finite Element. A force of P = 1000 kN is applied, as shown, and same node is displaced by an amount δ = 50 mm towards left side. Let E = 210 GPa and A = 600 mm^2 for each element.	10



3 (a)	Derive stiffness matrix for Spring Element using potential energy approach.	5
3 (b)	Find Global Stiffness Matrix for a two span continuous beam. Both spans of beam have constant El and have same span length.	5

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