

Roll No .....

**CE-6005 (2) (CBGS)**

**B.E. VI Semester**

Examination, May 2019

**Choice Based Grading System (CBGS)**

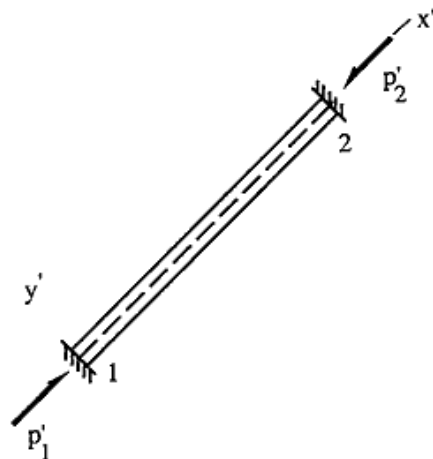
**Computational Methods in Structural  
Engineering**

*Time : Three Hours*

*Maximum Marks : 70*

- Note:** i) Attempt any five questions.  
ii) All questions carry equal marks.  
iii) Assume suitable data if any with justification

1. A truss member of length  $L$ , area of cross section  $A$  as shown in Figure. The change in length  $\Delta l$  is given by  $\Delta l = \alpha L \Delta T$ . Calculate the thermal effect/formation error in terms of induced stresses.



2. Explain with suitable example for the formation of structure (beam) stiffness matrix from its member stiffness matrices.
3. Describe about the Transfer Matrix Method (TMM) for continuous and discontinuous non prismatic members.
4. Differentiate between direct stiffness method and elastic stability analysis of pin jointed 2-D frames/trusses.
5. Describe in detail about use of substructures for reduction in order of stiffness matrix. <http://www.rgpvonline.com>
6. Describe the imposition constraints for Lagrange multiplier and penalty study.
7. Describe in detail about theory of elasticity in 2-D frames related to analysis of continuum structures.
8. Write short notes on the following:
  - a) 2-D isoperimetric elements
  - b) Shape function for a beam element
  - c) Lagrangian and Serendipity
  - d) Stiffness matrix for plate bending elements

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