

G.R. No.	
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Paper Code: P119-114 (ESE)

DECEMBER 2019 / ENDSEM
F. Y. M. TECH. (structures) (SEMESTER - I)
COURSE NAME: Finite Element Analysis
COURSE CODE: CVPB11184A
(PATTERN 2018:R1)

Time: [3 Hour]

[Max. Marks: 50]

(*) Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1)a) Write disadvantages of FEM

[3 marks]

OR

b) Illustrate with sketch degrees of freedom in case of beam element with axial deformation and bar element

[3 marks]

Q.2) a) Write two dimensional polynomials for linear strain triangle (LST)

[3 marks]

OR

b) what is the significance of shape function ?

[3 marks]

Q.3) a) What is the size of element stiffness matrix if a bar is discretized in 3-bar elements

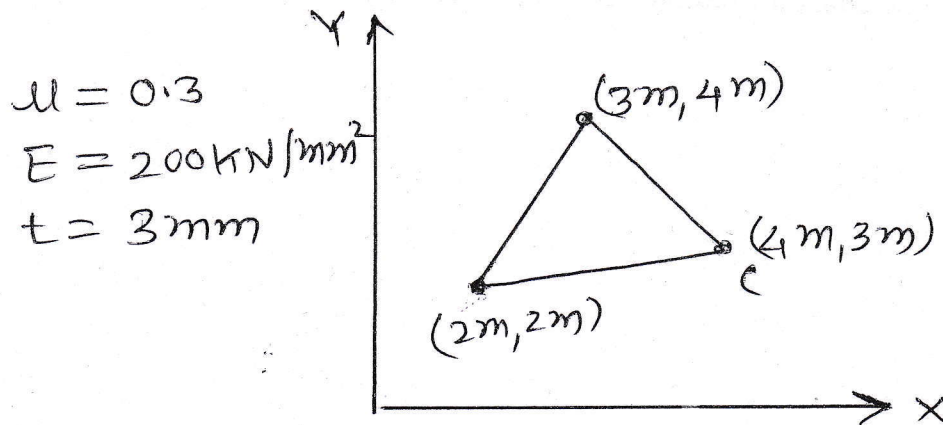
[2 marks]

OR

b) What is the function of transformation matrix in development of element stiffness matrix in Truss

[2 marks]

Q.4) For CST element shown in figure 1, determine element stiffness matrix [14marks]

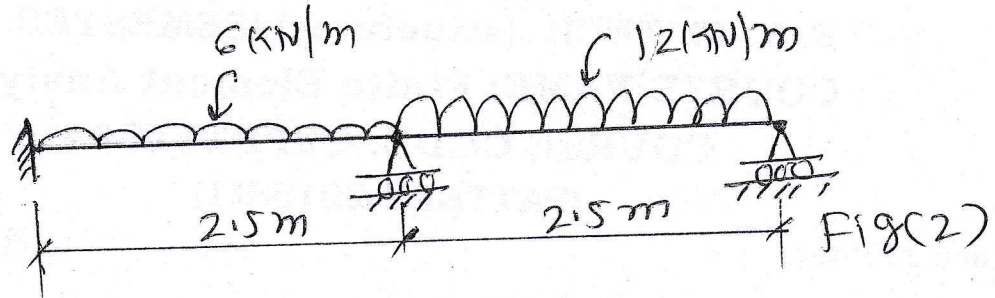


Fig(1)

OR

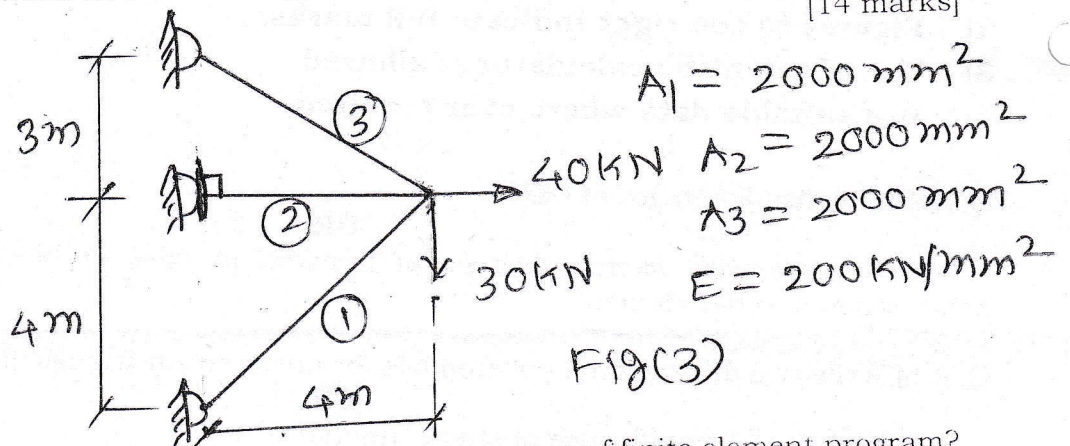
Q.5) Derive element stiffness matrix for CST using polynomials and for plane strain condition [14 marks]

Q.6) Analyze the beam as shown in figure 2, use finite element method, EI constant. [14 marks]



OR

Q.7) Analyze the truss as shown in figure 3, using finite element method [14 marks]



Q.8) a) What information control data gives in a structure of finite element program? [6 marks]

b) What is the criteria for location of nodes in FEM? [4 marks]

c) List any three commercial software in FEM and write applications of each commercial software [4 marks]

OR

Q.9) a) What are the guidelines of meshing/discretization? [6 marks]

b) Draw flow chart for simple finite element program [8 marks]