

B.E. Civil Engineering (Model Curriculum) Semester-VII
PCC-1-CE-701 - Structural Analysis-III

P. Pages : 3

Time : Four Hours



GUG/W/23/14285

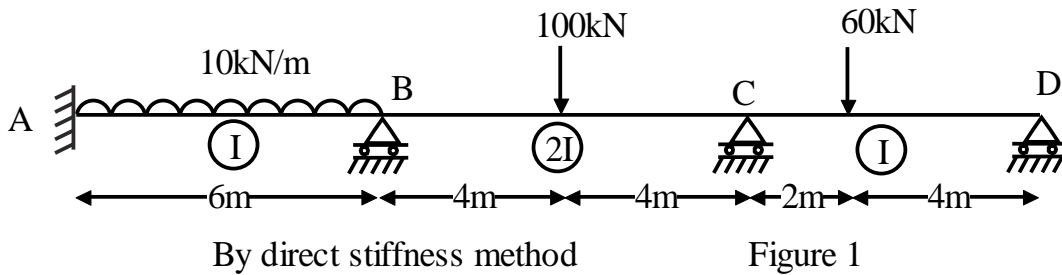
Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Illustrate your answers wherever necessary with the help of neat sketches.

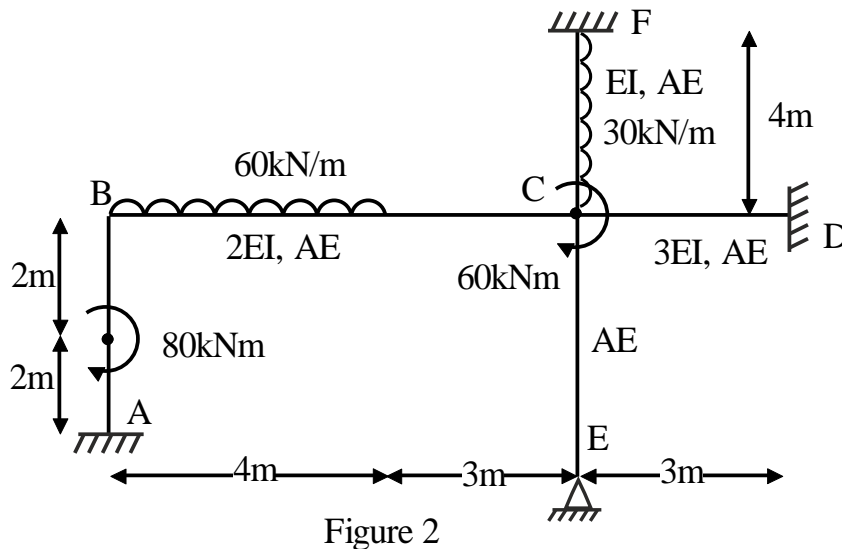
1. Derive member stiffness matrix for a beam element consider 2 noded beam. 16

OR

2. Analyse the continuous Beam shown in figure 1 support C sinks by 10mm. Take 16
 $E = 200\text{GPa}$ and $I = 3 \times 10^8 \text{ mm}^4$.



3. Find global stiffness matrix for the figure 2 shown below. 16
Size of beam = 0.3m x 0.4m
Size of column = 0.35 x 0.5m
Use of M20 grade concrete



OR

4. Analyse the portal frame by stiffness matrix method Neglect axial deformation.

16

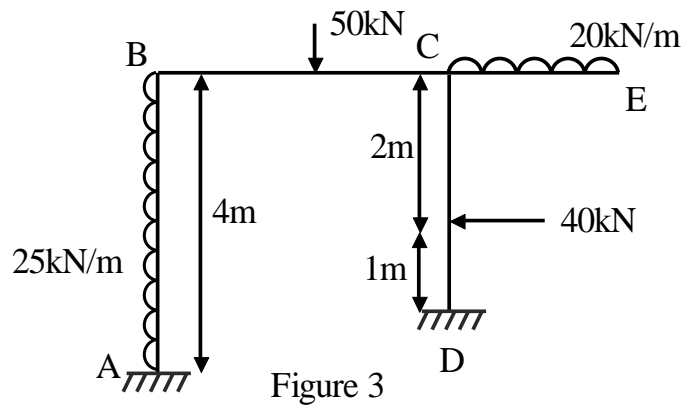


Figure 3

5. Figure 4 shows a pin Jointed plane truss formulate global stiffness matrix.

16

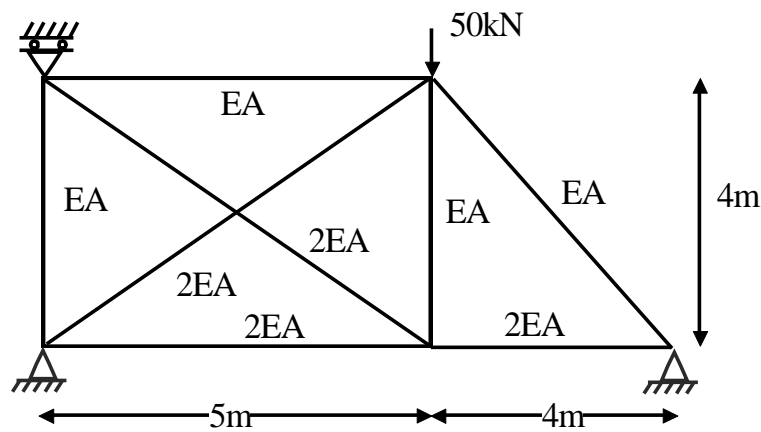


Figure 4

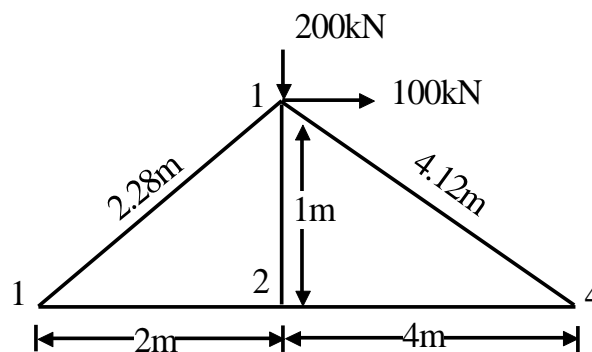
OR

6. Analyse the truss shown in figure 5 by stiffness matrix method

16

$$E = 2 \times 10^9 \text{ kN/m}^2$$

$$A = 5 \times 10^{-4} \text{ m}^2 \text{ For all members}$$



7. a) Explain linearly elastic and linearly inelastic system with suitable example.

8

- b) Explain SDOF system in details.

8

OR

8. a) Explain free and forced vibrations. 8
- b) Explain clearly with example the D'Alembert principle. 8
9. a) Explain the shape function and its use in FEM. 8
- b) What are storage techniques. 8

OR

10. Analyse as one dimensional bar element. Find displacement, stress, strain & reactions by finite element method Area of c/s(A) = $A_0 e^{-x/2L}$ 16

