

M.Tech. Structural Engineering & Construction (CBCS Pattern) Semester-I
PSES11 - Matrix Analysis of Structures

P. Pages : 2

Time : Three Hours



GUG/S/25/10961

Max. Marks : 70

- Notes :
1. Solve **any five** question.
 2. All questions carry equal marks.
 3. Due credit will be given to neatness and adequate dimensions.

1. Derive load vector and displacement matrix for simply supported beam subjected to $u \frac{\text{kN}}{\text{m}}$ uniformly distributed load along entire span of L and explain local and global stiffness matrix for simple truss member. **14**
2. Using symmetry of structure, determine displacement for the plane truss shown in figure 1 Use stiffness matrix method. **14**

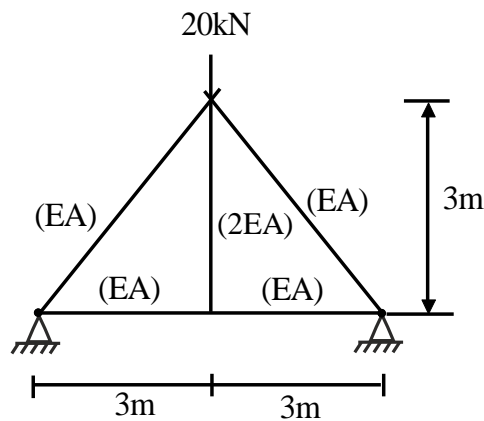


Figure 1

3. Analyse the portal frame ABCD shown in figure 2 by stiffness method and also sketch the bending moment diagram. **14**

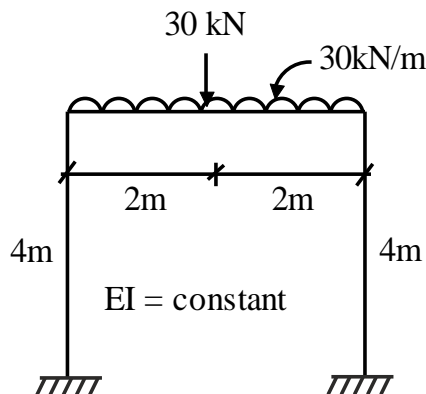
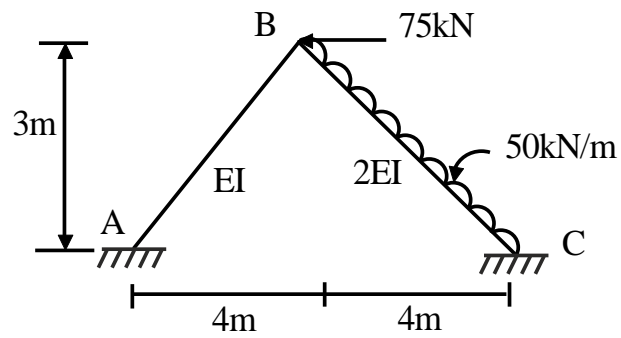
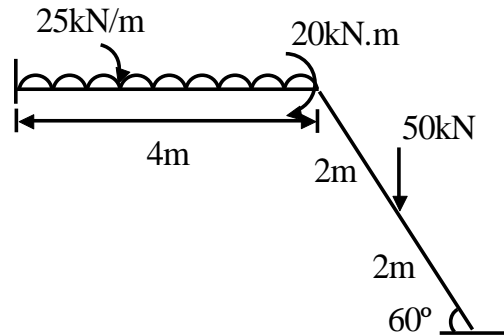


Figure -2

4. Analyze the frame shown in figure using direct stiffness method. 14



5. Analyse the frame below using direct stiffness method. 14



Take $E = 25.5 \times 10^6 \text{ kN/m}^2$
Size of member 230 x 450 mm

6. a) Explain the Procedure of analysis of building system for horizontal loads. 7
b) Explain the concept of buildings with and without rigid diaphragm. 7
