M.Tech. Structural Engineering & Construction CBCS Pattern Semester-I

PSES11 - Matrix Analysis of Structures

P. Pages : 2 **GUG/W/23/10961**

Time : Four Hours * 6 0 4 8 * Max. Marks : 70

Notes : 1. All questions carry equal marks.
2. Solve **any five** questions.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Drive the stiffness matrix for Spring element. **7**

b) Distinguish between the stiffness matrix and flexibility method. **7**

2. Using symmetry of the structure, determine displacement for the plane truss shown in figure 1. Use stiffness matrix method. **14**

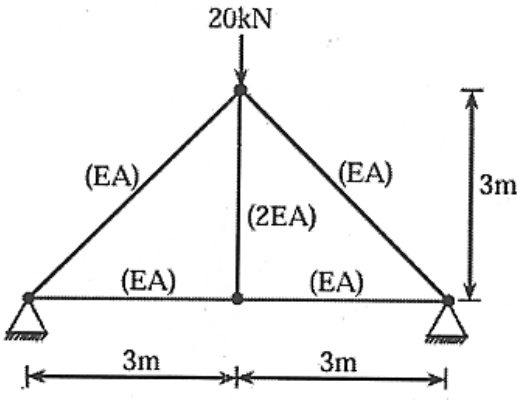
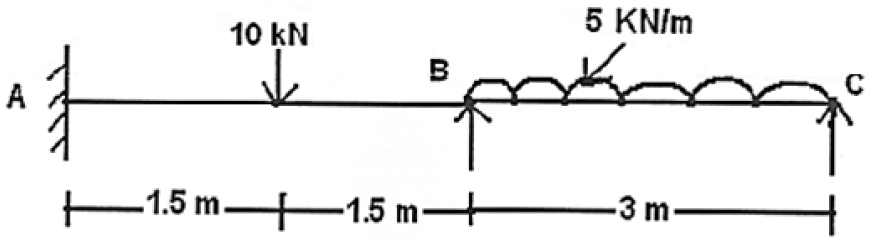


Figure 1

3. Analyse the continuous beam ABC shown in figure 2 by stiffness method and also draw the bending moment diagram. **14**



EI = Constant

Figure 2

4. a) Explain the concept of analysis for member loading for self, Temperature & Imposed. **7**

b) Explain the concept of inclined supports. **7**

5. Find out displacements for the grid shown in figure 3 using stiffness member approach. **14**
Take GJ = 0.8 EI.

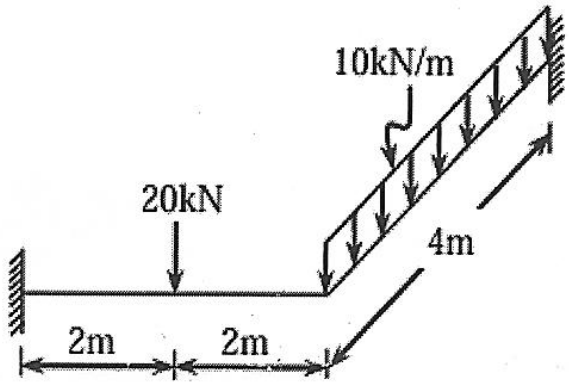


Figure 3

6. a) Explain in details the analysis of building systems for horizontal loads. **7**

b) Explain the concept of buildings with and without rigid diaphragm. **7**

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