

00501

**B.TECH. CIVIL ENGINEERING  
(BTCLEVI)**

**Term-End Examination**

**December, 2013**

**BICEE-017 : ADVANCED STRUCTURAL  
ANALYSIS**

*Time : 3 hours*

*Maximum Marks : 70*

*Note : Attempt any five questions. Assume any missing data suitably.*

1. Analyse the frame shown in fig. 1 by cantilever method. Take cross-sectional area of all columns as the same. 14

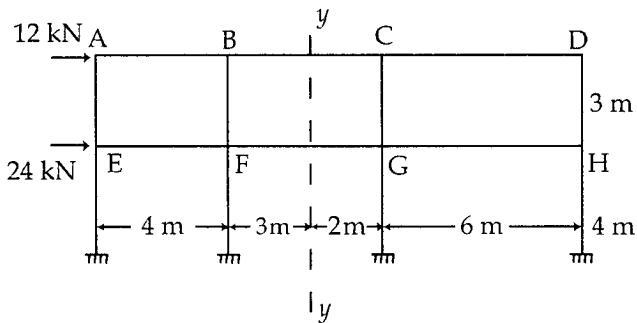


Fig. 1

2. Develop the stiffness matrix of a generalized beam A B of span L as shown in Fig. (2) 14

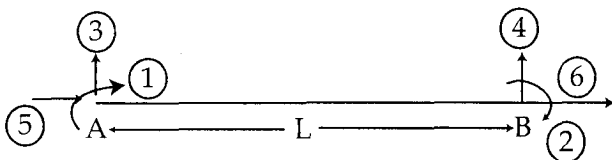


Fig. 2

3. Analyse the portal frame shown in Fig. 3 by flexibility matrix method. If the supports D settles 14

to right by  $\frac{20}{EI}$  and downward by  $\frac{50}{EI}$  in t-m.

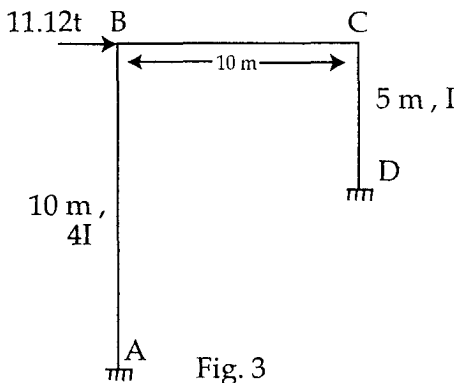
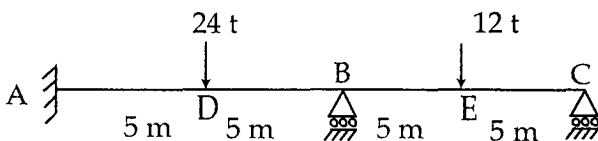


Fig. 3

4. Analyse the continuous beam shown in Fig. 4. The downward settlement of supports B and C 14

in t-m units are  $\frac{200}{EI}$  and  $\frac{100}{EI}$  respectively



EI is constant (fig. 4)

5. (a) Analyse the pin jointed plane frame by flexibility matrix method. Take flexibility of each member as  $0.025 \text{ cm/t}$  shown in fig. 5. 14
- (b) If member  $L_1V_2$  undergoes a rise of temp. by  $32^\circ \text{ C}$ , determine the forces in the member of the truss due to rise of temp. only.
- $\alpha = 11.0 \times 10^{-6} \text{ per } ^\circ\text{C}$ .

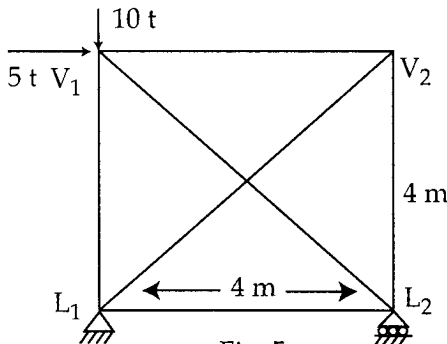


Fig. 5

6. Analyse the portal frame shown in fig : 6 by direct stiffness method neglecting axial deformations. 14
- Take
- $E = 200 \text{ GPa}$ ,  $I = 300 \times 10^{-6} \text{ m}^4$ ,
- $A = 100 \times 10^{-4} \text{ m}^2$ .

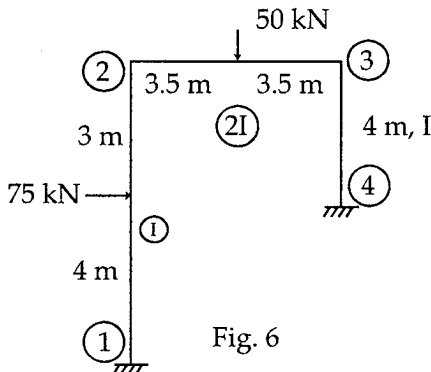


Fig. 6

7. (a) Discuss the step by step procedure of analysing a problem by finite element/ Analysis package. 7
- (b) Develop the flexibility and stiffness for the beam shown in fig. 7 with reference to given coordinates and verify that two matrices are reciprocal of each other. 7

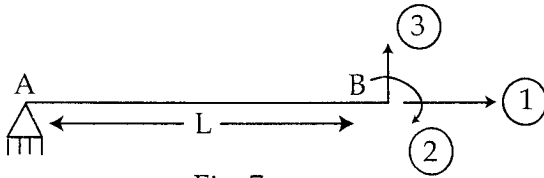


Fig. 7