

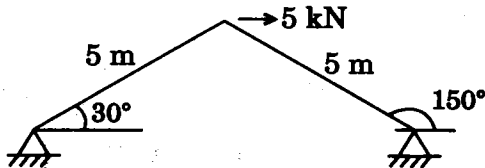
**B.Tech. CIVIL ENGINEERING (BTCLEVI)****Term-End Examination****June, 2015**

00621

**BICEE-017 : ADVANCED STRUCTURAL ANALYSIS***Time : 3 hours**Maximum Marks : 70*

*Note : Attempt any five questions. All questions carry equal marks. Assume any missing data suitably. Use of calculator is permitted.*

1. Analyse the two member truss shown in Figure 1. Assume EA to be constant for all members. The length of each member is 5 m. 14

*Figure 1*

2. A continuous beam ABCD is carrying uniformly distributed load of 5 kN/m as shown in Figure 2. Compute reactions due to the following support settlements :

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Support B      0.005 m      Vertically downwards

Support C      0.010 m      Vertically downwards

Assume  $E = 200 \text{ GPa}$  and  $I = 4 \times 10^{-4} \text{ m}^4$ .

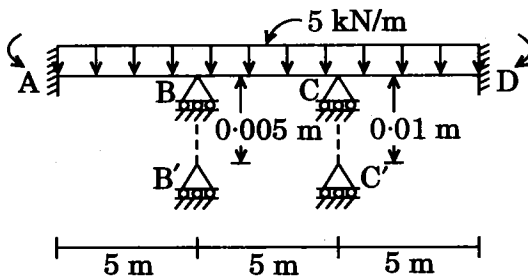


Figure 2

3. Analyse the continuous beam shown in Figure 3 by Force method. The beam rests on elastic supports at B and C. The flexibility of supports B and C in t-m units are  $10/EI$  and  $25/EI$  respectively.

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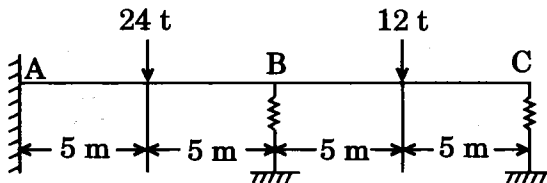


Figure 3

4. Analyse the portal frame shown in Figure 4 by Displacement method. The flexibility of support D for horizontal and vertical displacement in t-m units D are  $10/EI$  and  $20/EI$  respectively. 14

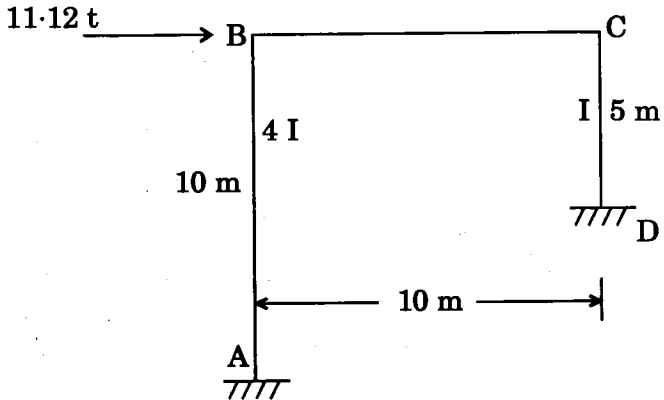


Figure 4

5. Using the Stiffness method, analyse for end moments of the frame shown in Figure 5. 14

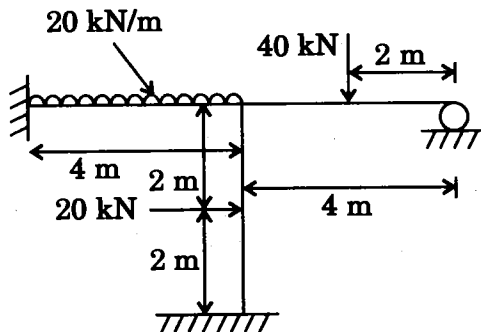


Figure 5

6. (a) Distinguish between Stiffness and Flexibility methods. 7
- (b) Prove that stiffness and flexibility matrices are reciprocal of each other. 7
7. (a) How will you construct the matrix by Force method and Displacement method ? 7
- (b) Write the various steps that are taken in construction of matrix by Flexibility method, with suitable diagram. 7
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