

III B.Tech I Semester Examinations, December 2011
STRUCTURAL ANALYSIS-II
Civil Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. Explain the Portal method for analyzing a building frame subjected to horizontal forces. [16]
2. Analyse the continuous beam shown in figure 2 by the force method in which the shear force and bending moment at the centre of the central span are treated as the redundants. Hence calculate support reactions at A&D. EI is constant. [16]

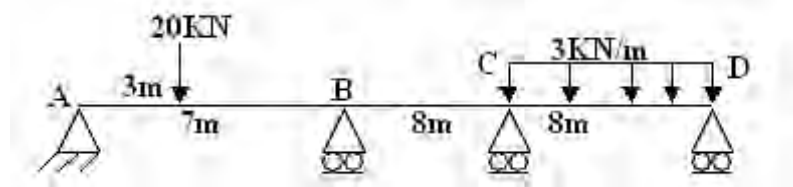


Figure 2

3. A continuous beam ABC, 20 m long is fixed at ends A and C and continuous over support B. The first span of length 12 m is loaded with a UDL of intensity 6 kN/m and the second span is loaded with a point load of 64 kN acting at 3 m from the right support. Spans AB and BC have moments of Inertia of 3I and I respectively and are of the same material. Using the slope deflection method, calculate the end moments and plot the bending moment diagram, yielding supports, which permit a downward settlement of $48/EI$ at B. [16]
4. Explain the rotation contribution method for the frames with columns of equal height and subjected to vertical loads only with fixed ends and also hinged ends. [16]
5. Analyse the continuous beam shown in figure 5 using displacement method. EI is constant. Draw BMD. [16]

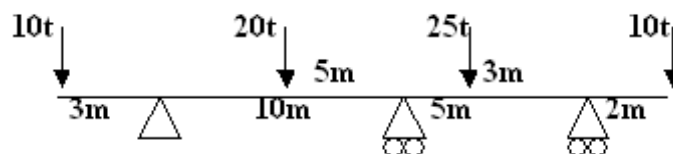


Figure 5

6. A Portal frame shown in figure 6 is subjected to a loading as shown. Analyse the frame using moment distribution method and draw BMD. EI is constant. [16]

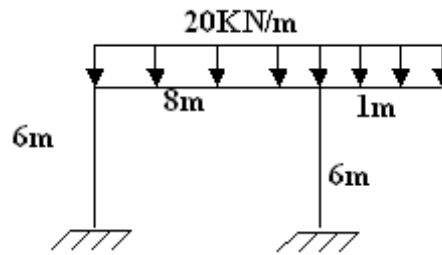


Figure 6

7. A two-hinged parabolic arch of span 30 m and central rise 5 m is carrying a point load of 100 kN at a distance of 10 m from the left support. Determine
- (a) horizontal thrust and
 - (b) B.M. under the load. [16]
8. A circular arch of span 25 m with a central rise 5 m is hinged at the crown and springing. It carries a point load of 100 kN at 6 m from the left support. Calculate.
- (a) the reactions at the supports and the reaction at crown
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1. Analyse the continuous beam shown in figure 1 using displacement method. EI is constant. Draw BMD. [16]

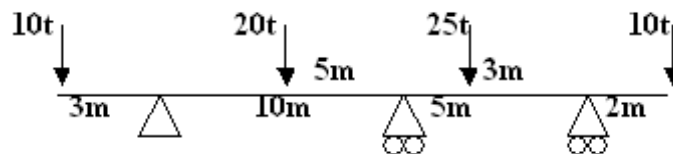


Figure 1

2. A Portal frame shown in figure 2 is subjected to a loading as shown. Analyse the frame using moment distribution method and draw BMD. EI is constant. [16]

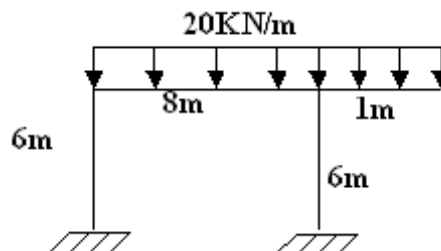


Figure 2

3. Explain the rotation contribution method for the frames with columns of equal height and subjected to vertical loads only with fixed ends and also hinged ends. [16]
4. Analyse the continuous beam shown in figure 4 by the force method in which the shear force and bending moment at the centre of the central span are treated as the redundants. Hence calculate support reactions at A&D. EI is constant. [16]

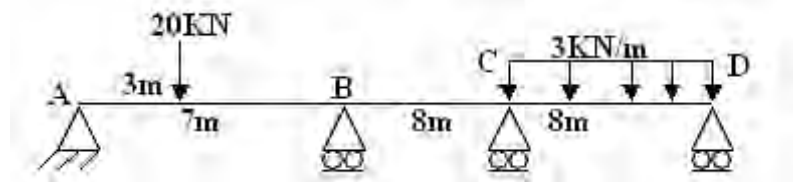


Figure 4

5. A circular arch of span 25 m with a central rise 5 m is hinged at the crown and springing. It carries a point load of 100 kN at 6 m from the left support. Calculate.
- (a) the reactions at the supports and the reaction at crown

- (b) moment at 5 m from the left support. [16]
6. Explain the Portal method for analyzing a building frame subjected to horizontal forces. [16]
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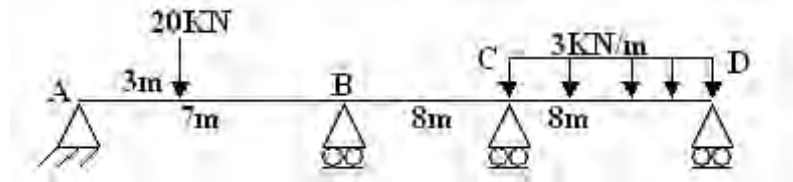


Figure 1

2. Explain the rotation contribution method for the frames with columns of equal height and subjected to vertical loads only with fixed ends and also hinged ends. [16]
3. A Portal frame shown in figure 3 is subjected to a loading as shown. Analyse the frame using moment distribution method and draw BMD. EI is constant. [16]

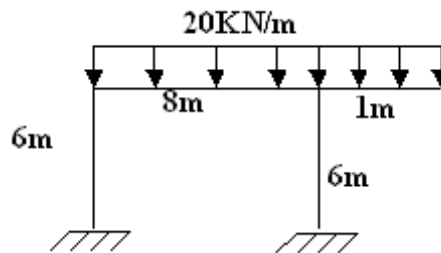


Figure 3

4. Analyse the continuous beam shown in figure 4 using displacement method. EI is constant. Draw BMD. [16]

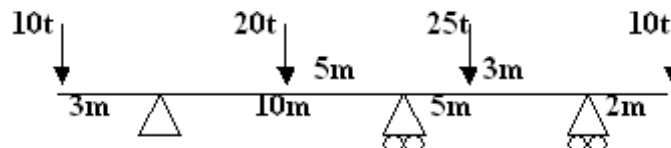


Figure 4

5. Explain the Portal method for analyzing a building frame subjected to horizontal forces. [16]
6. A circular arch of span 25 m with a central rise 5 m is hinged at the crown and springing. It carries a point load of 100 kN at 6 m from the left support. Calculate.

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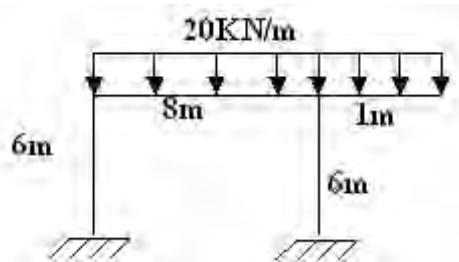


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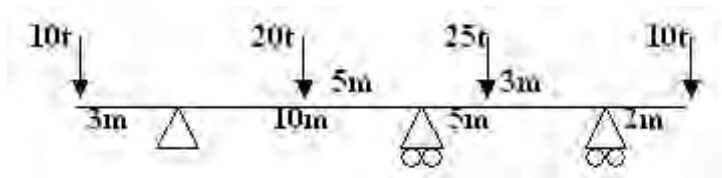


Figure 4

5. Analyse the continuous beam shown in figure 5 by the force method in which the shear force and bending moment at the centre of the central span are treated as the redundants. Hence calculate support reactions at A&D. EI is constant. [16]

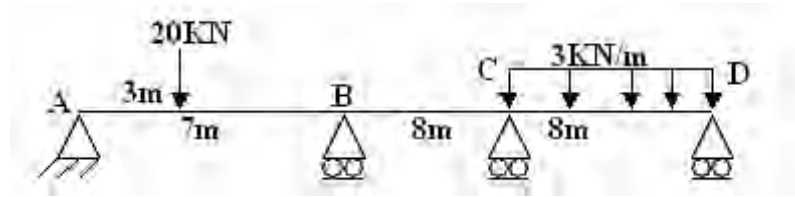


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