

Total No. of printed pages = 4

CE 131502 (NR)

Roll No. of candidate

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21/2/22 2021

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B.Tech. 5th Semester End-Term Examination

CE

STRUCTURAL ANALYSIS - II

(New Regulation)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

Note :

1. Question 1 is compulsory.
2. Solve any *four* from Question 2 to Question 7
3. Assume any missing data.

1. Write the correct answers for the following questions: (10 × 1 = 10)
- (i) The sum of rotation factor at joint is _____.
 - (ii) The carry over factor for the prismatic beam whose far end is hinged is _____.
 - (iii) For a symmetric beam with symmetric loading, the stiffness factor for the center of the span is _____.
 - (iv) As per Muller Breslau principle, the influence line of a function is same as the _____ of the beam.
 - (v) The moment of inertia of an analogous column of a propped cantilever beam of length L and flexure rigidity EI is _____.
 - (vi) The area of the influence line diagram for the reaction of a simply supported beam of span L is _____.
 - (vii) Moment distribution method is also called as _____.
 - (viii) The maximum bending moment due to train of wheel loads on a simply supported beam always occurs _____.
 - (ix) Name the method in which compatibility and force-displacement equations are used to get the solution.
 - (x) The final moment at the hinged support of a beam is _____.

[Turn over

2. Analyse the beam shown in Figure Q2 using Slope deflection method. Draw the shear force and bending moment diagrams for the beam. Take EI as constant.

(9+3+3=15)

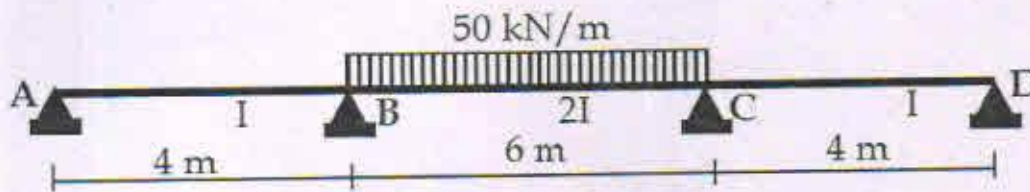


Figure Q2

3. Analyse the frame shown using Moment distribution method. Draw the shear force and bending moment diagrams for the frame. EI is constant. (9+3+3=15)

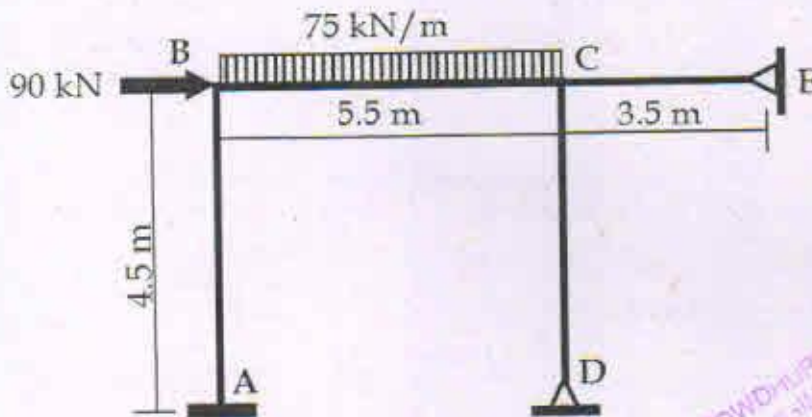


Figure Q3

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4. Determine the end moments of the beam shown in Figure Q4 using Kani's method. Draw the shear force and bending moment diagrams for the frame. Take the value of EI as constant. (9+3+3=15)

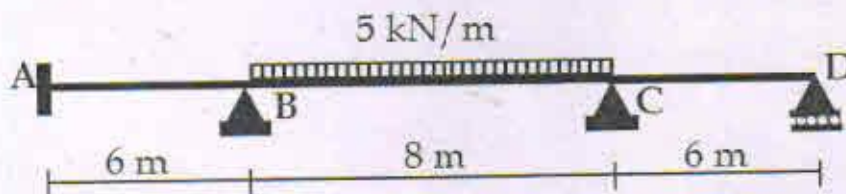


Figure Q4

5. Locate the position of principal axes and find the value of the principal moment of inertia for the section shown in the Figure Q5. (6+9=15)

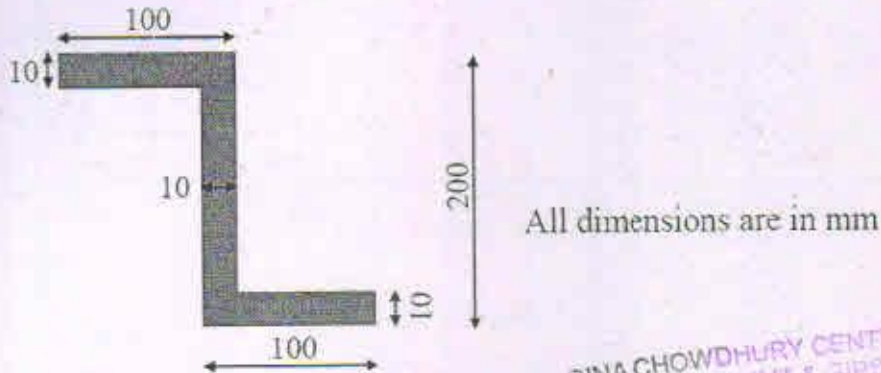


Figure Q5

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6. Determine the end moments of the frame using Column Analogy Method. Draw the bending moment diagram. Take $E = \text{constant}$. (12+3=15)

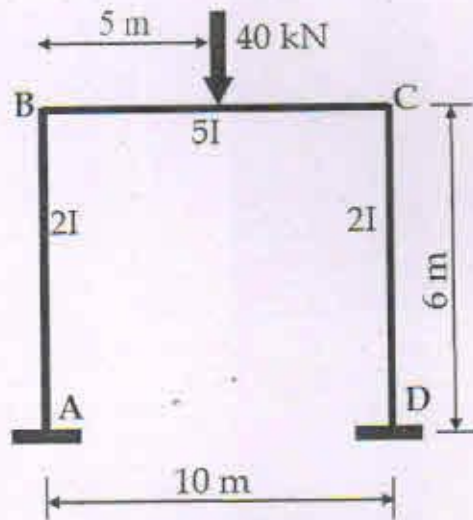


Figure Q6

7. (a) Determine the maximum positive shear created at point B in the beam shown in Figure Q7(a) due to the wheel loads of moving truck. Draw the influence line for shear.

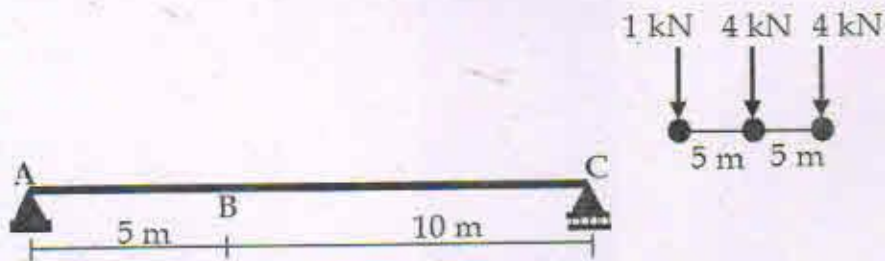


Figure Q7(a)

- (b) Determine the maximum positive moment created at point B in the beam shown in Figure Q7(b) due to the wheel loads of crans. Draw the influence line for moment. (7+8=15)

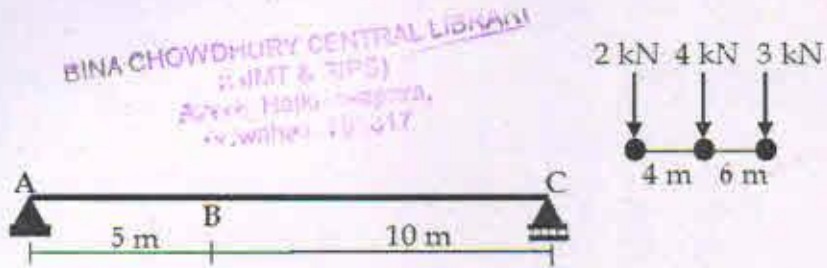


Figure Q7 (b)