

**STRUCTURAL ANALYSIS - II**

(Civil Engineering)

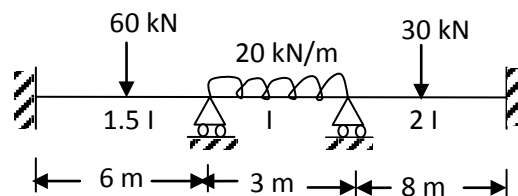
Time: 3 hours

Max. Marks: 70

**PART - A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- State Eddy's theorem.
  - Explain rib shortening.
  - Write the assumptions in slope deflection method.
  - Define carry over moment and distribution factor.
  - Write Advantages of Kani's method.
  - Calculate the rotation factors for the beam shown in figure below.



- Write concepts in flexibility method.
- Define stiffness and write the basic equation of stiffness method.
- Define plastic Hinge and plastic moment capacity.
- Define collapse load and load factor.

**PART - B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT - I**

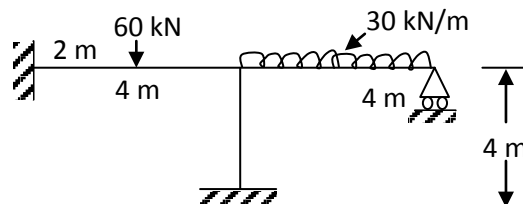
- 2 A three-hinged circular arch hinged at the springing and crown point has a span of 40 m and a central rise of 8 m. It carries a uniformly distributed load of 20 kN/m over the left-half of the span together with a concentrated load of 100 kN at the right quarter span point. Find the reactions at the supports, normal thrust and shear at a section 10 m from left support.

OR

- 3 A three hinged parabolic arch of 20 m span and 4 m central rise carries a point load of 4 kN at 4 m horizontally from the left hand hinge. Calculate the normal thrust and shear force at the section under the load. Also, calculate the maximum B.M positive and negative.

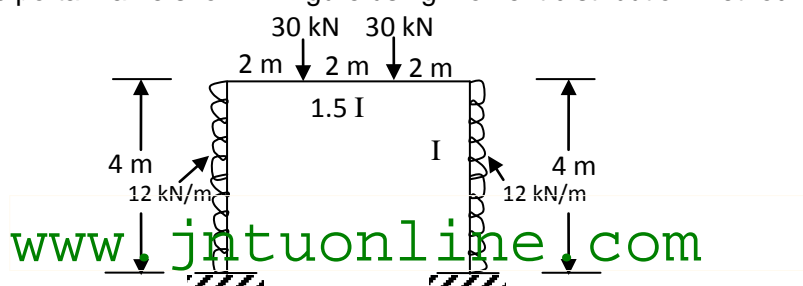
**UNIT - II**

- 4 Analyze the frame shown in figure by slope deflection method. Draw BMD flexural rigidity is same for all members.



OR

- 5 Analyze the portal frame shown in figure using moment distribution method.

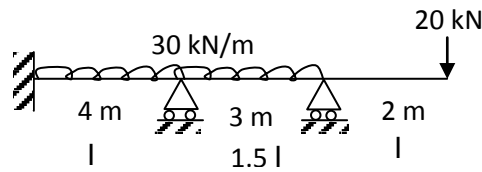


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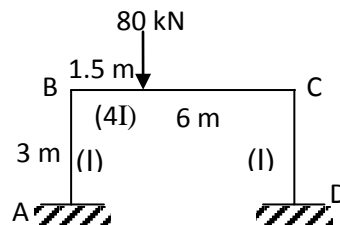
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**UNIT - III**

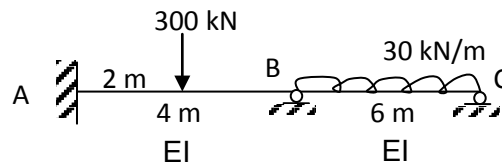
- 6 Analyze the continuous beam shown in figure using Kani's method.

**OR**

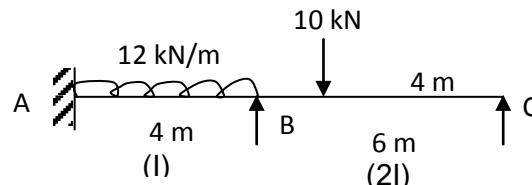
- 7 Analyze the frame shown in figure using Kani's method.

**UNIT - IV**

- 8 Analyze the continuous beam shown in figure by the flexibility method. Draw SFD and BMD.

**OR**

- 9 Analyze the continuous beam shown in figure by Stiffness method. Draw BMD.

**UNIT - V**

- 10 Write the assumptions for evaluating fully plastic moment. And also derive fully plastic moment  $M_p$  and shape factor  $S$  in general.

**OR**

- 11 Derive the shape factors for:

- Triangular section.
- Hollow circular section.

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