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Code No: NR410105 **NR** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
ADVANCED STRUCTURAL ANALYSIS
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. By the moment distribution method, analyse the frame 6 shown and sketch the bending moment diagram.
   AD = 10m; BC = 6m; CD = 4m. [16]

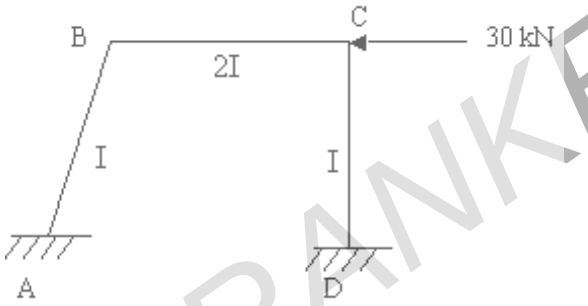

Figure 6

2. Analyse the frame shown in figure 1 by the stiffness method.

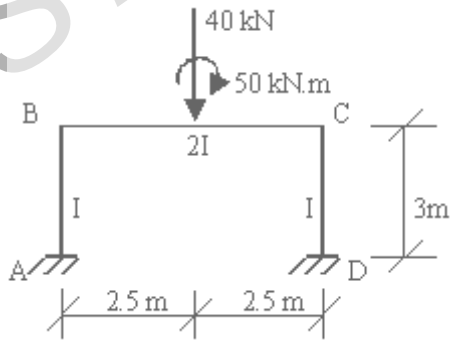

Figure 1

3. Calculate the maximum plastic moment capacity of the propped cantilever beam shown in figure 4. [16]

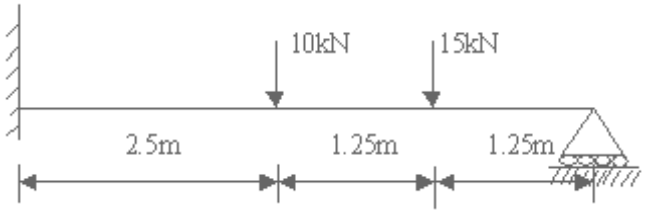

Figure 4

4. A semi-infinite beam resting on an elastic foundation is hinged at one end and a moment of 12 N-m is applied at the hinged end. If the beam is 80mm wide and

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60mm thick, determine the maximum deflection and stresses in the beam. Assume E=2×10^5 N/mm^2, γ=0.30 and modulus of foundation as 8.4 N/mm^3. [16]

5. Obtain the stiffness matrix S for the beam shown below, assuming that the flexural rigidity of the middle span is twice that of the end spans. The unknown displacements are to be numbered from left to right in the figure 3. [16]

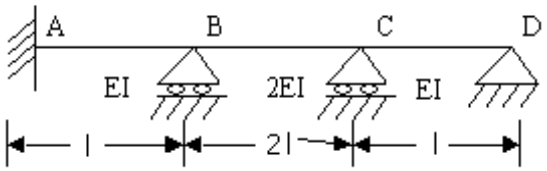

Figure 3

6. Analyse the Portal frame figure 2, by Portal method assuming that all the columns have equal area of cross-section for the purpose of analysis. [16]

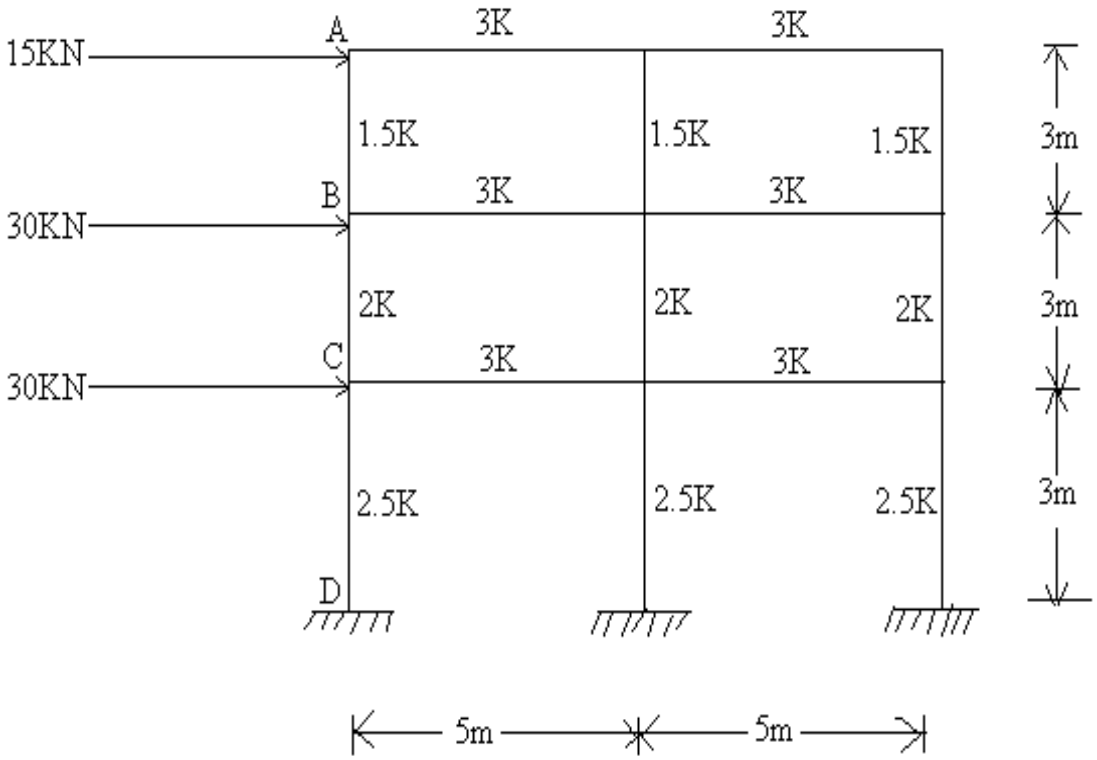

Figure 2

7. For the three span continuous beam shown in figure 7, compute the influence ordinates at 2.0 m intervals and plot the influence line for the vertical reaction at B. [16]

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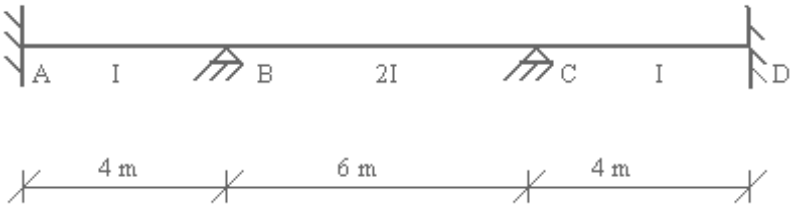

Figure 7

8. Find the right support reaction, using the principle of minimum strain energy, for the statical indeterminate beam loaded as shown in figure 8. Sketch the S.F. and B.M. diagrams marking the salient values. (EI = constant). [16]

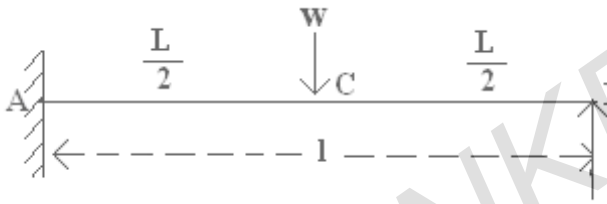

Figure 8

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Code No: NR410105 **NR** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
ADVANCED STRUCTURAL ANALYSIS
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Find the right support reaction, using the principle of minimum strain energy, for the statical indeterminate beam loaded as shown in figure 8. Sketch the S.F. and B.M. diagrams marking the salient values. (EI = constant). [16]

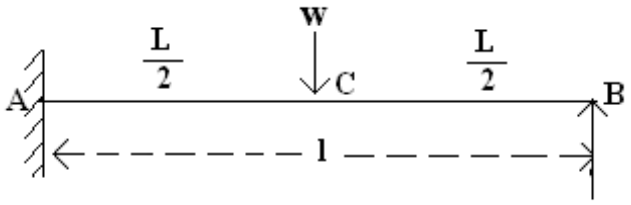

Figure 8

2. For the three span continuous beam shown in figure 7, compute the influence ordinates at 2.0 m intervals and plot the influence line for the vertical reaction at B. [16]

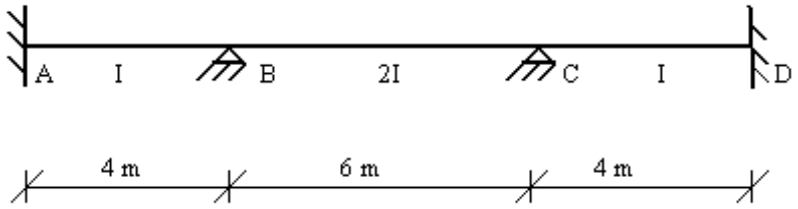

Figure 7

3. Obtain the stiffness matrix S for the beam shown below, assuming that the flexural rigidity of the middle span is twice that of the end spans. The unknown displacements are to be numbered from left to right in the figure 3. [16]

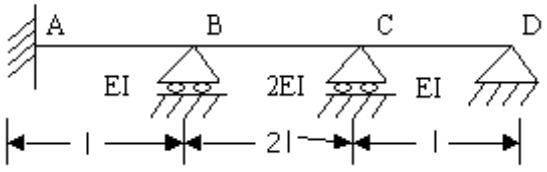

Figure 3

4. A semi-infinite beam resting on an elastic foundation is hinged at one end and a moment of 12 N-m is applied at the hinged end. If the beam is 80mm wide and 60mm thick, determine the maximum deflection and stresses in the beam. Assume E=2×10^5 N/mm^2, γ=0.30 and modulus of foundation as 8.4 N/mm^3. [16]

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5. Analyse the frame shown in figure 1 by the stiffness method.

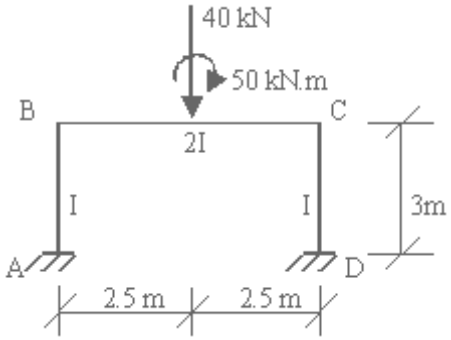

Figure 1

6. Calculate the maximum plastic moment capacity of the propped cantilever beam shown in figure 4. [16]

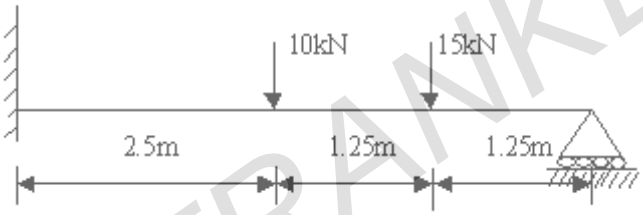

Figure 4

7. Analyse the Portal frame figure 2, by Portal method assuming that all the columns have equal area of cross-section for the purpose of analysis. [16]

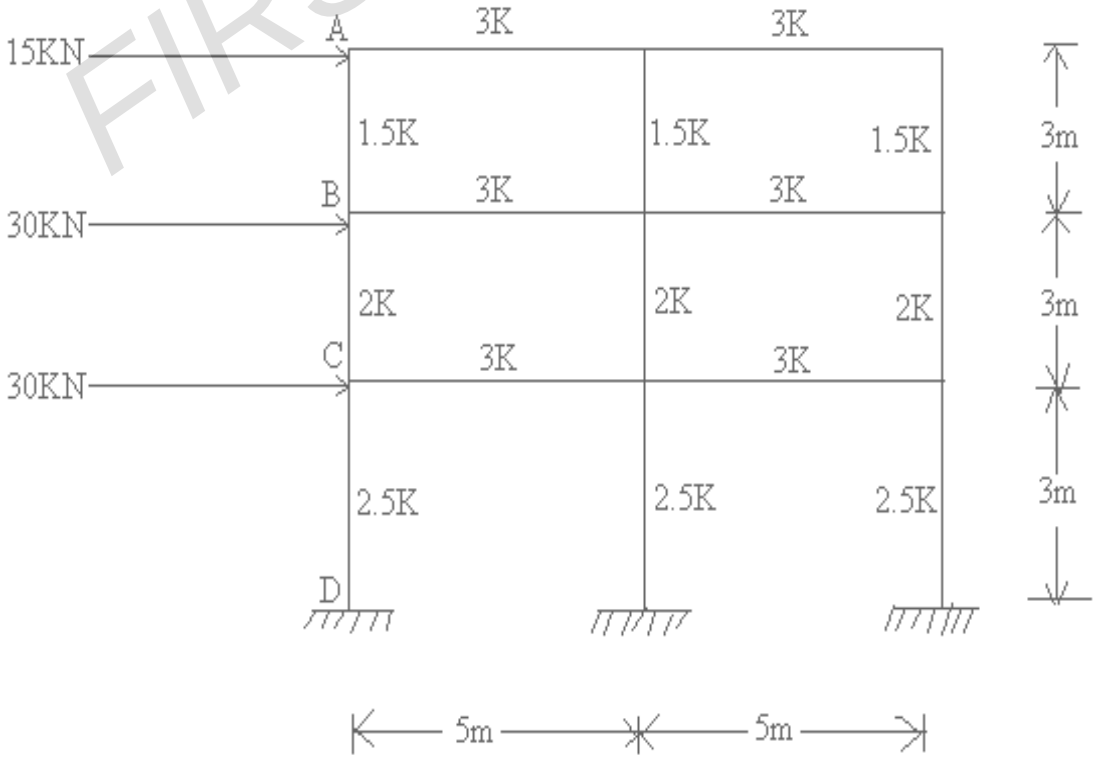

Figure 2

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8. By the moment distribution method, analyse the frame 6 shown and sketch the bending moment diagram.
AD = 10m; BC = 6m; CD = 4m. [16]

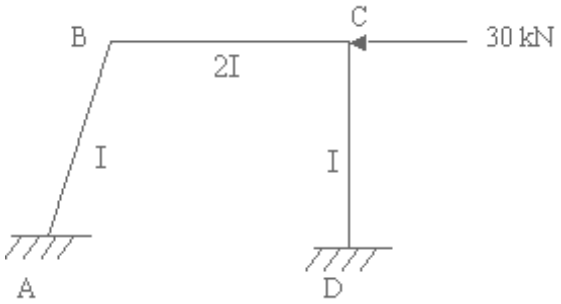

Figure 6

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Code No: NR410105 **NR** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
ADVANCED STRUCTURAL ANALYSIS
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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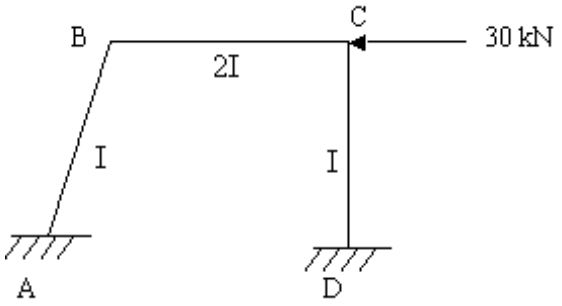

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2. A semi-infinite beam resting on an elastic foundation is hinged at one end and a moment of 12 N-m is applied at the hinged end. If the beam is 80mm wide and 60mm thick, determine the maximum deflection and stresses in the beam. Assume E=2×10^5 N/mm^2, γ=0.30 and modulus of foundation as 8.4 N/mm^3. [16]

3. For the three span continuous beam shown in figure 7, compute the influence ordinates at 2.0 m intervals and plot the influence line for the vertical reaction at B. [16]

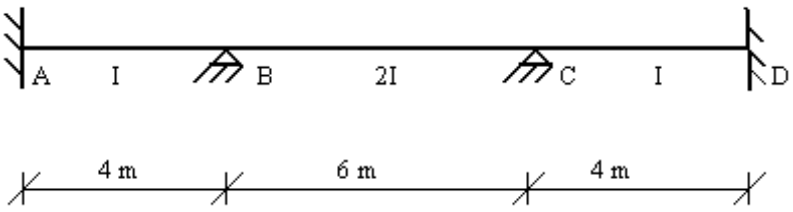

Figure 7

4. Analyse the frame shown in figure 1 by the stiffness method.

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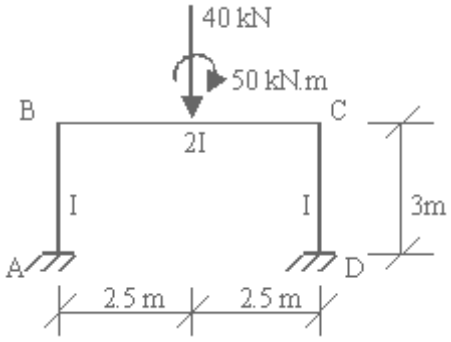
Code No: NR410105 **NR** **Set No. 1**



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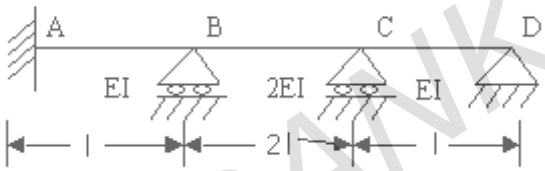
5. Obtain the stiffness matrix S for the beam shown below, assuming that the flexural rigidity of the middle span is twice that of the end spans. The unknown displacements are to be numbered from left to right in the figure 3. [16]



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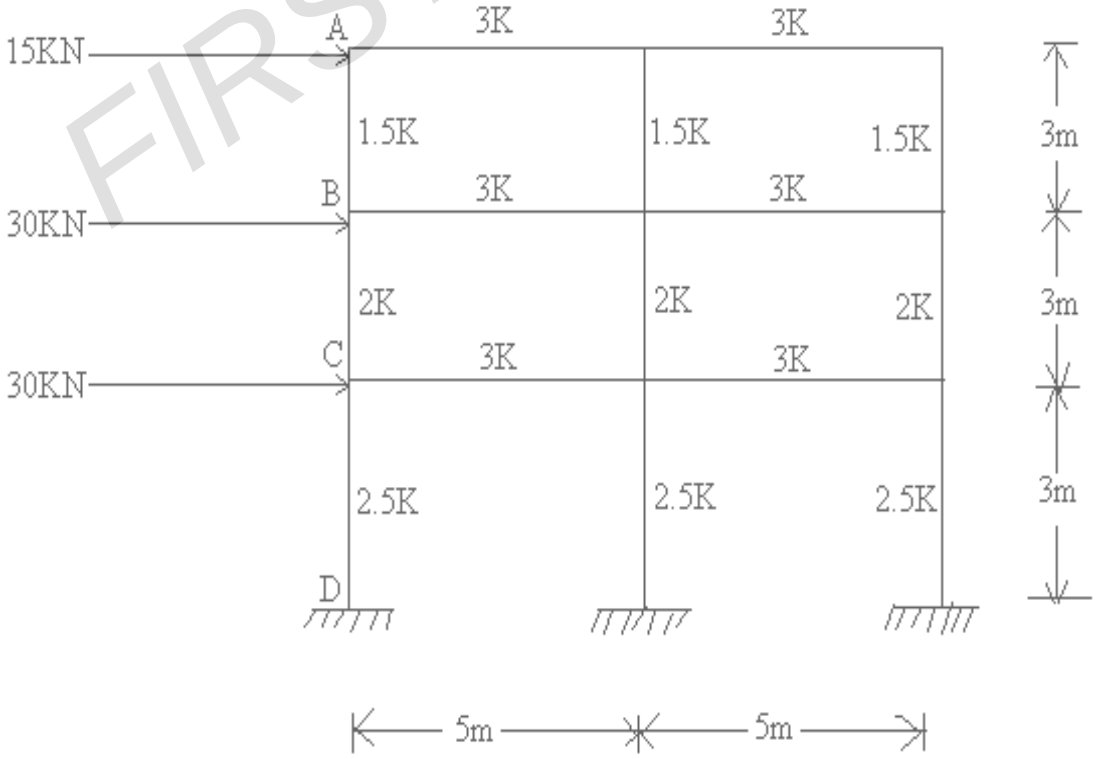

Figure 2

7. Find the right support reaction, using the principle of minimum strain energy, for

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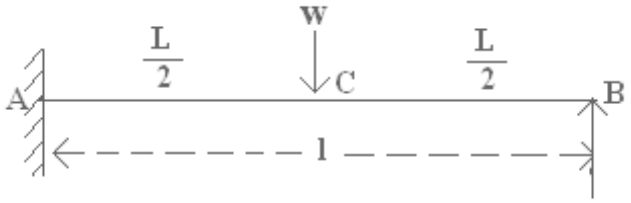
the statical indeterminate beam loaded as shown in figure 8. Sketch the S.F. and B.M. diagrams marking the salient values. (EI = constant). [16]



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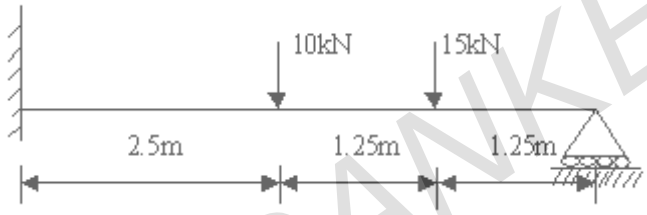

Figure 4

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Code No: NR410105 **NR** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
ADVANCED STRUCTURAL ANALYSIS
Civil Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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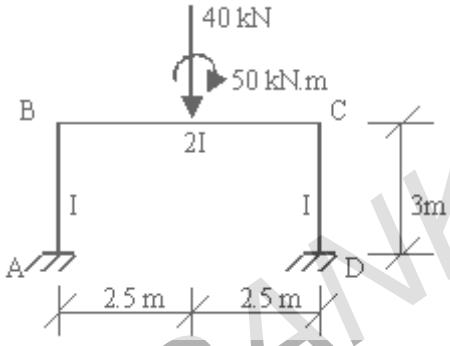

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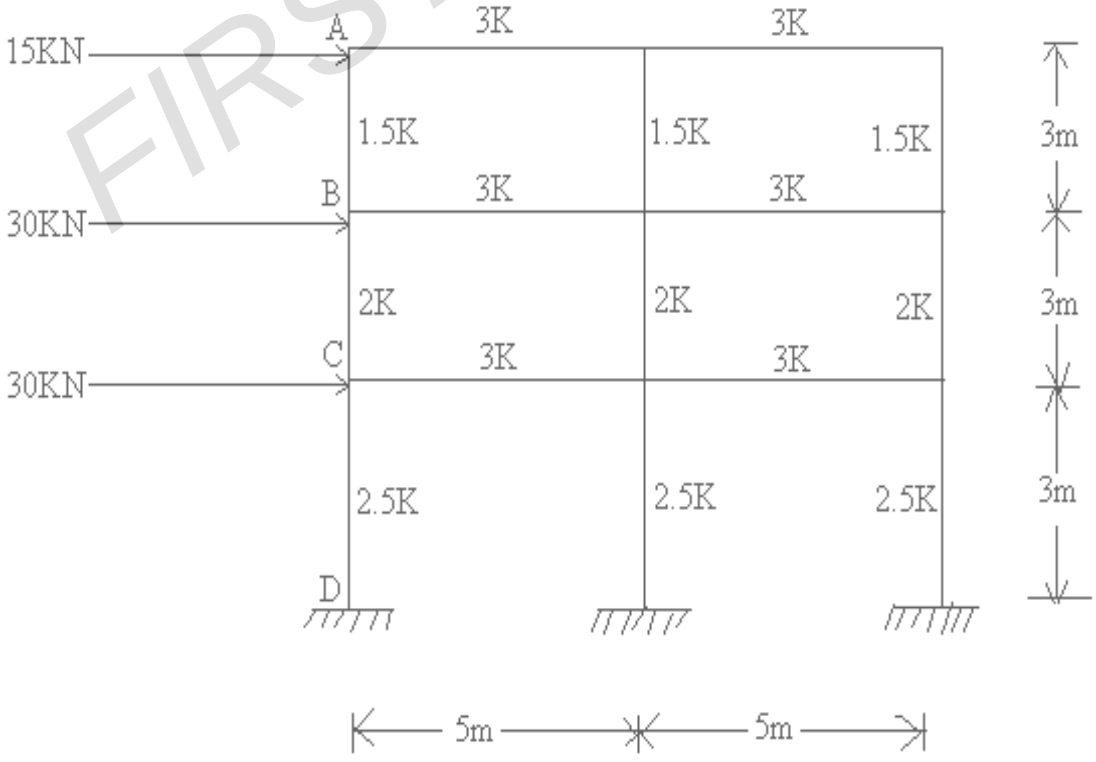

Figure 2

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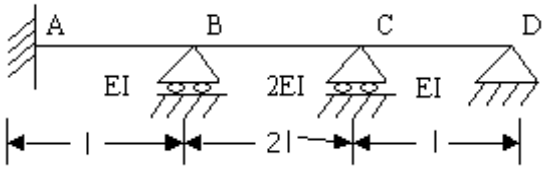
rigidity of the middle span is twice that of the end spans. The unknown displacements are to be numbered from left to right in the figure 3. [16]



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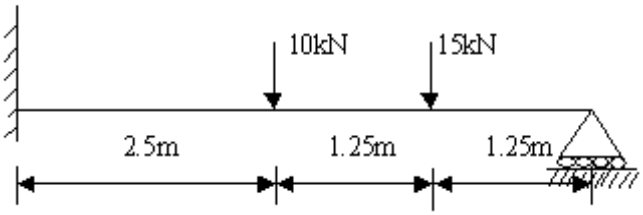

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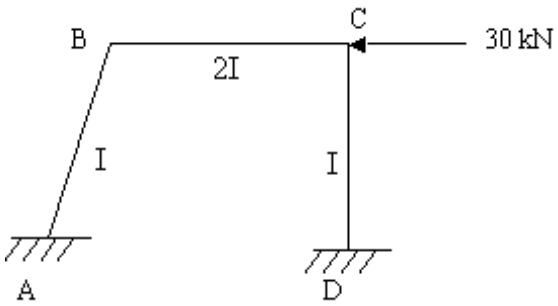

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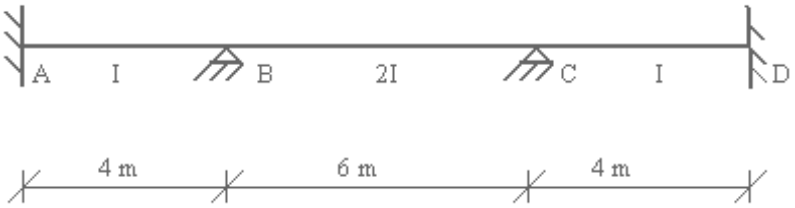

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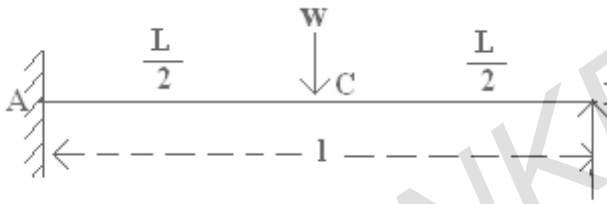

Figure 8

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