



SHANTILAL SHAH ENGINEERING COLLEGE, BHAVNAGAR
APPLIED MECHANICS DEPARTMENT

Assignment No: 05

Date: 11/09/2018

MOMENT DISTRIBUTION METHOD

Sub Code 2150608

Title of Subject Structural Analysis - II

| # | Questions |
|----|---|
| 1 | Explain: Carry over factor, Moment Distribution factor and Rotation contribution factor |
| 2 | For a joint 'O' of a plane frame with the members OA, OB, and OC having constant EI and length 2m, 3m and 4m respectively, if end A is free, end B is hinged and end C is fixed, then moment distribution factor for OA, OB and OC will be respectively _____. |
| 3 | Define the term 'sway'. Enlist the situation wherein say occur in portal frames. |
| 4 | Analyze the beam as shown in FIGURE - 1 by moment distribution method and draw shear force and bending moment diagram. The beam has constant EI for both the spans. |
| 5 | Determine the support moment for a continuous beam as shown in FIGURE - 2 by moment distribution method. Also draw bending moment diagram. |
| 6 | A beam AB is fixed at A and hinged at B. If the end B sinks by amount 'δ', what will be the moment developed at end A and at end B? |
| 7 | A fixed beam AB is of span 5 m. If one of the end settles by 10 mm, what will be the reaction developed at each support? $E = 200 \times 10^3 \text{ N/mm}^2$, $I = 3 \times 10^7 \text{ mm}^4$. |
| 8 | For a continuous beam ABCD as shown in FIGURE - 3 , find the moments at all supports if, end A rotates by 0.002 radian in the clockwise order and the support B settles by 5 mm. $E = 200 \times 10^3 \text{ N/mm}^2$, $I = 9 \times 10^7 \text{ mm}^4$. |
| 9 | Analyze the frame as shown in FIGURE - 4 , by moment distribution method and draw shear force and bending moment diagram |
| 10 | Analyze the frame shown in FIGURE - 5 with using moment distribution method. Draw bending moment diagram only |
| 11 | Analyse the portal frame shown in Figure - 6 by moment distribution method and find only Final Moments. |



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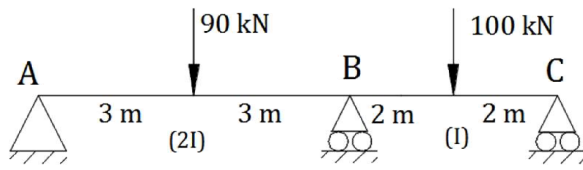


FIGURE - 1

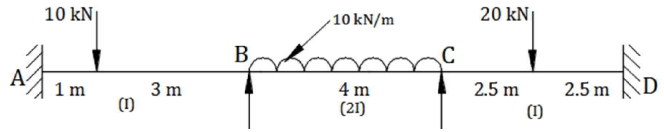


FIGURE - 2

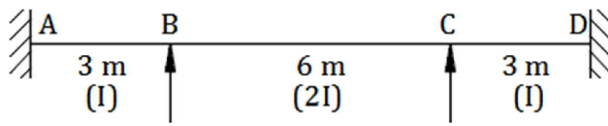


FIGURE - 3

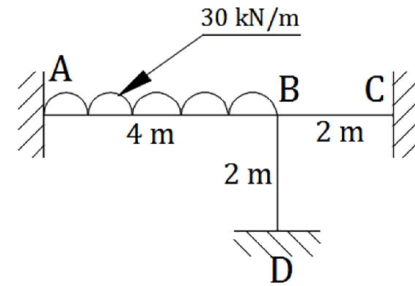


FIGURE - 4

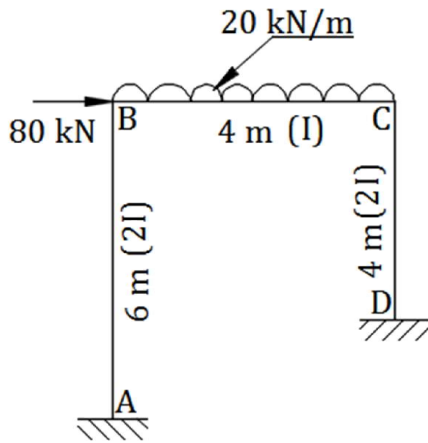


FIGURE - 5

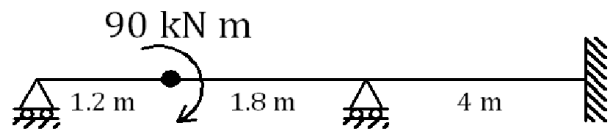


FIGURE - 6



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INFLUENCE LINES FOR DETERMINATE STRUCTURE

Title of Subject Structural Analysis - II

| # | Questions |
|---|---|
| 1 | State the Importance of the Influence Lines. Give the Difference between Influence Line Diagram and Shear Force & Bending Moment Diagrams |
| 2 | A simply supported beam AB has a span of 8 m. Draw influence lines for R_A , R_B , V_x & M_x for a section 3 m from left end support |
| 3 | A train of loads as shown in Figure - 1 crosses a simply supported girder of span 18 m from left to right. Calculate maximum SF & BM at section 8 m from left. |
| 4 | Draw the influence line diagram for the beam shown in Figure - 2 , (i) the reaction at A, (ii) the reaction at C, (iii) the shear at B. |
| 5 | Two wheel loads of 16 kN & 8 kN at a fixed distance apart of 2 m, cross a beam of 10 m span. Draw the influence line for B.M & S.F for a point 4 m from the left abutment & find the maximum B.M & S.F at that point. |
| 6 | A simple support beam of span 30 m is loaded by a train of six wheel loads each of equal magnitude 5 kN and separated by 2 m distance. Calculate the maximum positive and negative shear force and bending moment at 10 m from left support. |
| 7 | A uniformly distributed load of 12 kN/m and 3 m length crosses a simply supported girder of span 10 m from left to right. Draw influence line for shear force and bending moment at 4 m from left hand and find maximum shear force and bending moment at this section. Refer Figure - 3 . |
| 8 | Draw Influence Line diagram for forces in the members U_2U_3 , L_1L_2 , U_3L_3 , U_2L_3 and L_1U_2 of a Truss as shown in Figure - 4 . |



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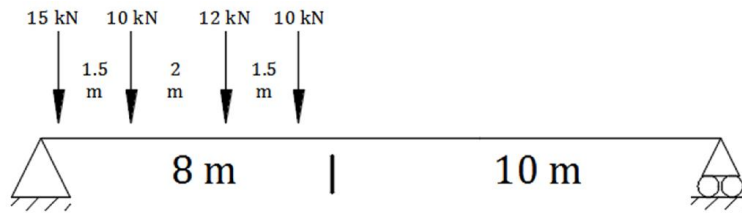


FIGURE - 1



FIGURE - 2

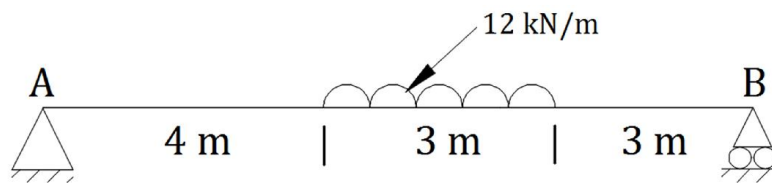


FIGURE - 3

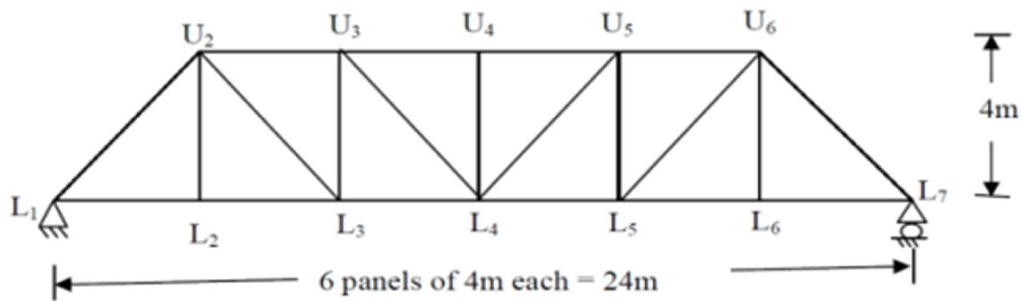


FIGURE - 4



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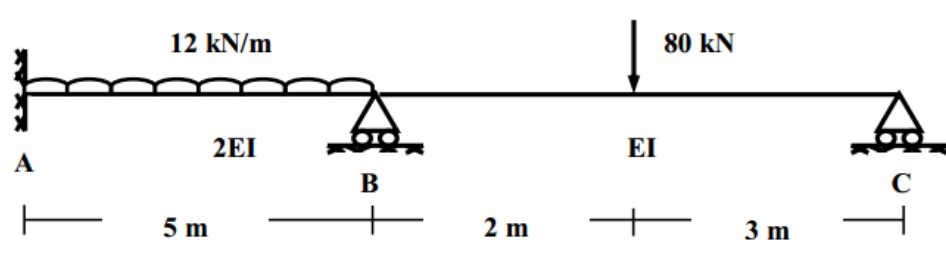
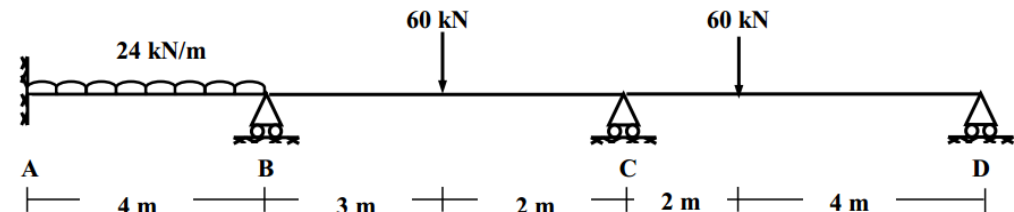
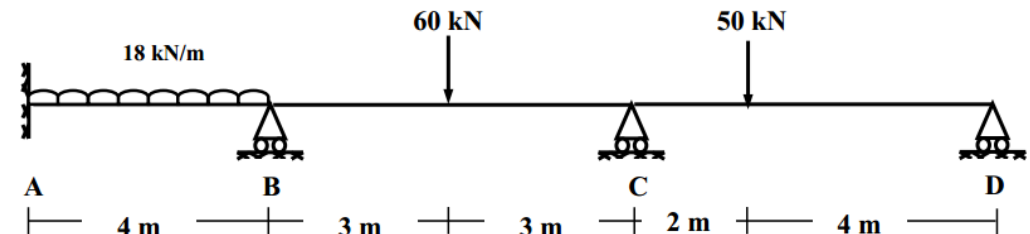
Assignment No: 7

Date: 15-09-2018

MATRIX METHODS

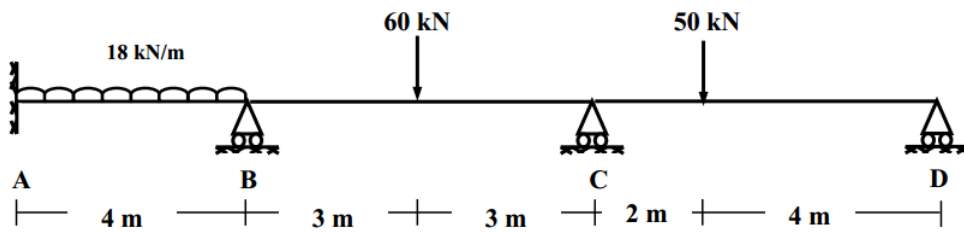
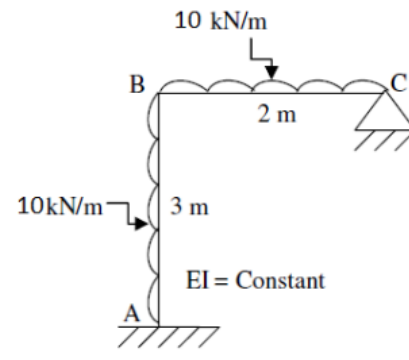
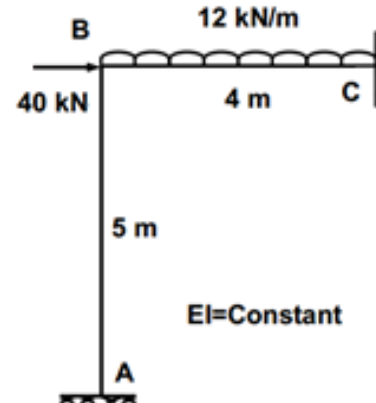
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Title of Subject STRUCTURAL ANALYSIS - II

| # | Questions |
|---|--|
| 1 | Differentiate between stiffness and flexibility. |
| 2 | Give characteristics of stiffness and flexibility matrix. |
| 3 | Formulate Displacement Matrix for a propped cantilever beam of span 4 m subjected to a central point load of 40 kN. |
| 4 | A propped cantilever beam of span 6 m is subjected to point load at center. Analyse the beam using flexibility method and draw shear force and bending moment diagrams. |
| 5 | Analyse the beam as shown in Figure using stiffness method and draw SFD and BMD.  |
| 6 | Analyse the beam as shown in Figure using stiffness method and draw SFD and BMD.  |
| 7 | For beam shown in Figure formulate stiffness matrix and load vector.  |



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| | |
|----|---|
| 8 | <p>Using stiffness method formulate displacement matrix, reactions and draw Shear force and bending moment diagram for the beam shown in Figure.</p>  |
| 9 | <p>Analyse the plane frame as shown in Figure below using flexibility method.</p>  |
| 10 | <p>Analyse the plane frame as shown in Figure below using flexibility method.</p>  |