R18

Code No: 156AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February/March - 2022
ADVANCED STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Using suitable examples, explain the static indeterminacy and kinematic indeterminacy of different structures.
b) Derive the force- displacement equation for a truss element. [10+5]

2.a) Explain banded matrix and semi band width. Give examples how band width can be reduced with nodal numbering scheme.
b) How to assemble the individual stiffness matrices? [10+5]

3. Analyze the continuous beam shown in figure 1 below. Assume EI as uniform. Use Matrix flexibility method. [15]

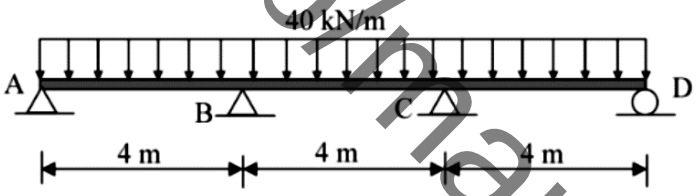

Figure 1

4.a) Generate the stiffness matrix for the structure with coordinates as shown in Figure 2.

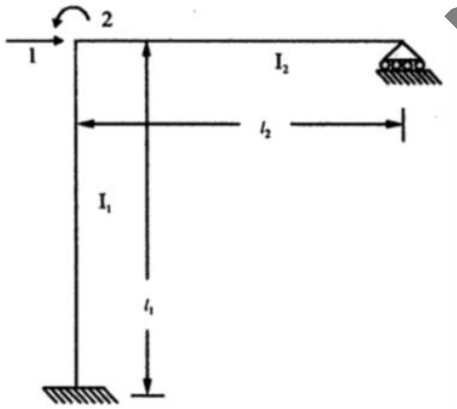

Figure 2

b) Analyse the continuous beam shown in figure 3 by stiffness matrix method. [5+10]

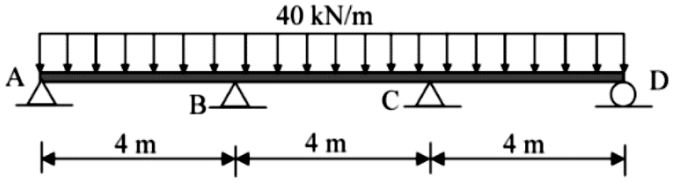

Figure 3

5. Analyze the continuous beam shown in figure 4 below by stiffness method. Draw bending Moment diagram and elastic curve. [15]

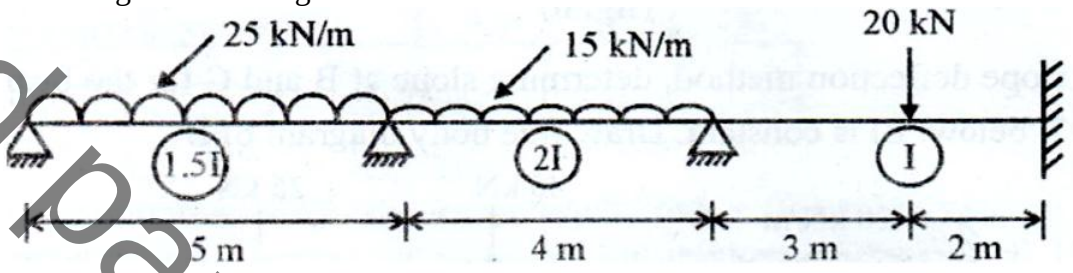

Figure 4

6.a) Explain the steps involved in assembly of stiffness matrix with suitable examples.
b) Explain the transformation of co-ordinates with a suitable example. [10+5]

7. Analyze the portal frame ABCD shown in figure 5 below by flexibility matrix method and sketch the bending moment diagram. [15]

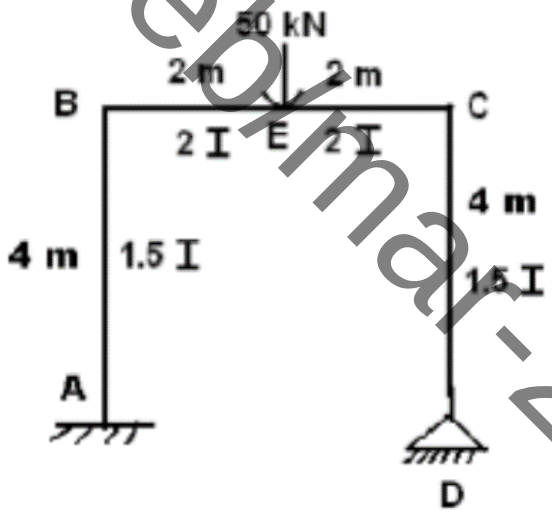

Figure 5

8.a) Explain the structural behavior of large frames with and without shear walls.
b) Explain about static condensation technique. [8+7]

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