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10CV751

Seventh Semester B.E. Degree Examination, Feb./Mar.2022
Matrix Method of Structural Analysis

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. ***Missing data, if any, may be suitably assumed.***

PART – A

1 Explain :
(i) Static and kinematic indeterminacy.
(ii) Equivalent joint loads.
(iii) Principle of super position.
(iv) Principle of contragradience. **(20 Marks)**

2 Analyze the continuous beam shown in Fig. Q2 by flexibility method. Assume uniform EI. Also draw BMD. **(20 Marks)**

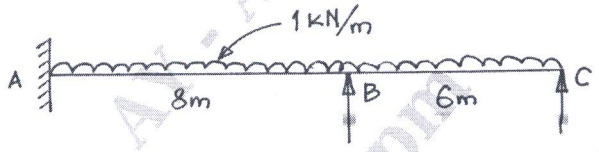

Fig. Q2

3 Analyze the frame shown in Fig. Q3 by flexibility method. Assume uniform EI. Also draw BMD. **(20 Marks)**

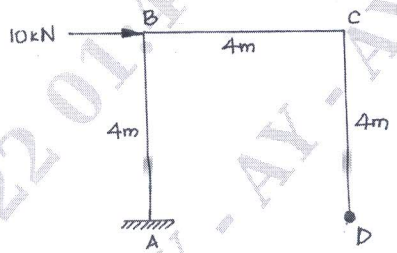

Fig. Q3

4 Find the member forces of the truss shown in Fig. Q4 by force transformation method. Assume $\frac{\ell}{AE} = 1$ for all members. **(20 Marks)**

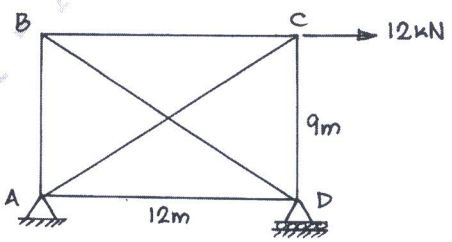

Fig. Q4

PART – B

5 Use displacement transformation method to solve the continuous beam shown in Fig. Q5. Also draw BMD. **(20 Marks)**

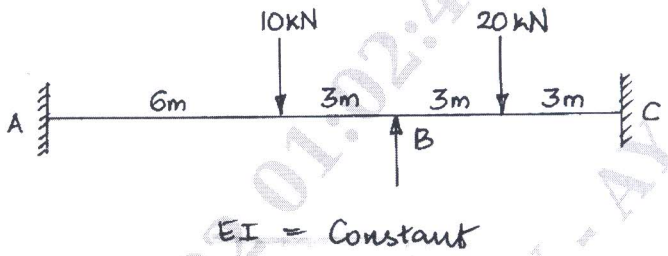

Fig. Q5.

6 Analyze the frame shown in Fig. Q6 by displacement transformation method. Draw BMD. Take EI = unity. **(20 Marks)**

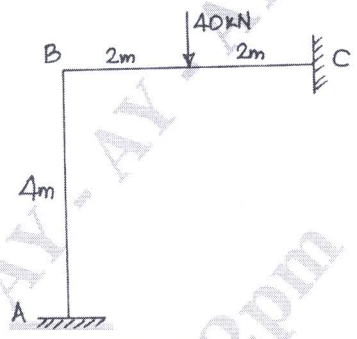

Fig. Q6

7 Determine the axial forces in the truss shown in Fig. Q7 by displacement transformation method. $\frac{AE}{L} = 0.1 \frac{kN}{mm}$ for all members. **(20 Marks)**

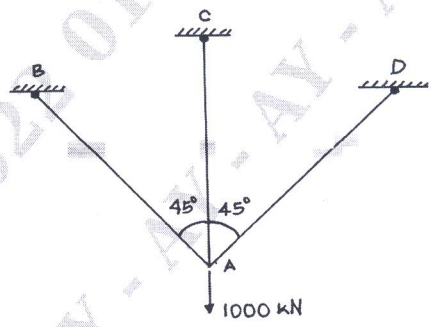

Fig. Q7

8 Analyze the continuous beam shown in Fig. Q8 by direct stiffness method. Assume EI to be constant for all members. **(20 Marks)**

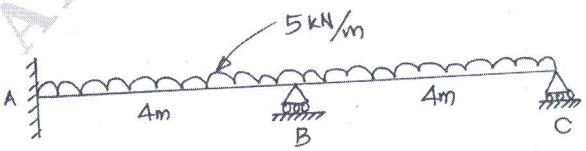

Fig. Q8

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