

USN

--	--	--	--	--	--	--	--	--	--

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

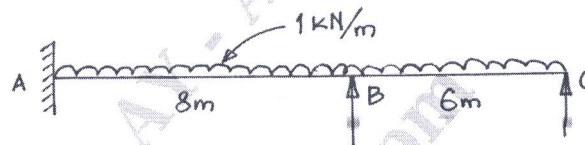


Fig. Q2

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

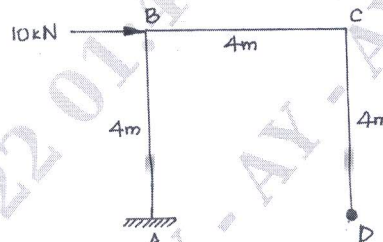


Fig. Q3

- 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)

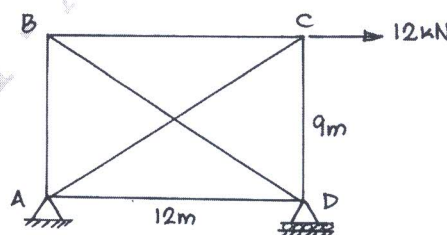
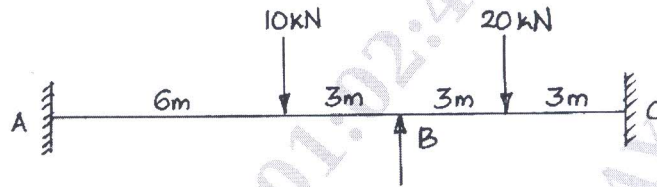


Fig. Q4

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – B

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



$EI = \text{Constant}$

Fig. Q5.

- 6 Analyze the frame shown in Fig. Q6 by displacement transformation method. Draw BMD. Take $EI = \text{unity}$. (20 Marks)

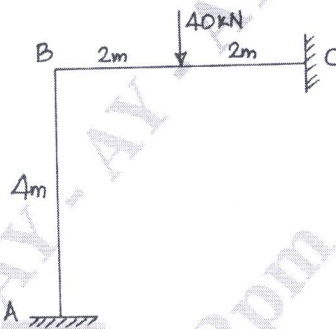


Fig. Q6

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

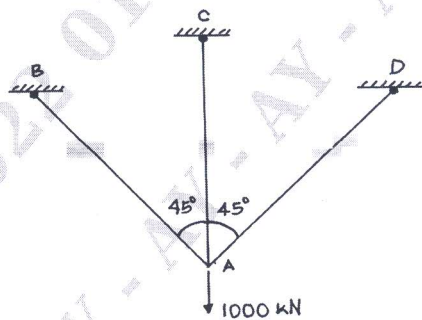


Fig. Q7

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

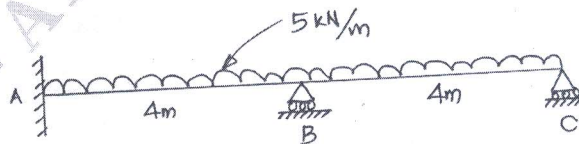


Fig. Q8
