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First Semester M.Tech. Degree Examination, May/June 2010
Computational Structural Mechanics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. What is kinematic indeterminacy and static indeterminacy? Explain with examples. (08 Marks)
- b. Determine the flexibility matrix of the cantilever beam shown in Fig.1(b). (12 Marks)

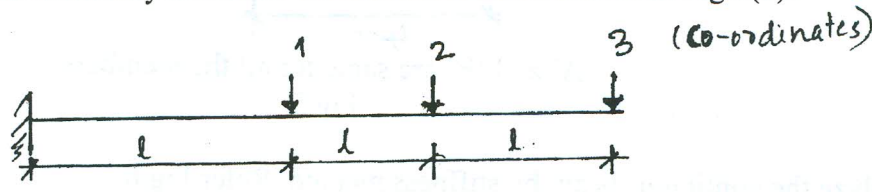


Fig.1(b)

- 2 Analyze the continuous beam by flexibility method. Refer Fig.2. (20 Marks)

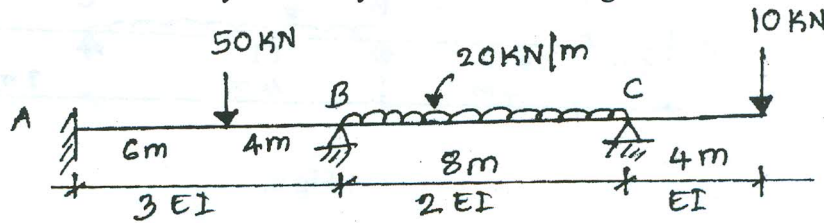
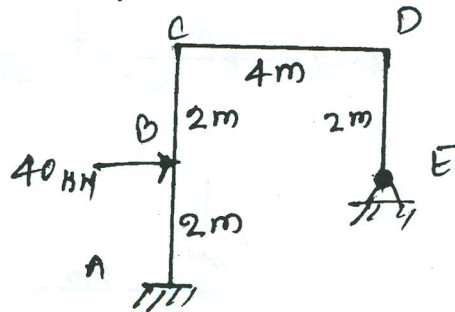


Fig.2.

- 3 Analyze the given frame by flexibility method and draw the BMD. Refer Fig.3. (20 Marks)



EI = constant for all members.

Fig.3.

- 4 Analyze the continuous beam by flexibility method. EI is constant for all members. Refer Fig.4. (20 Marks)

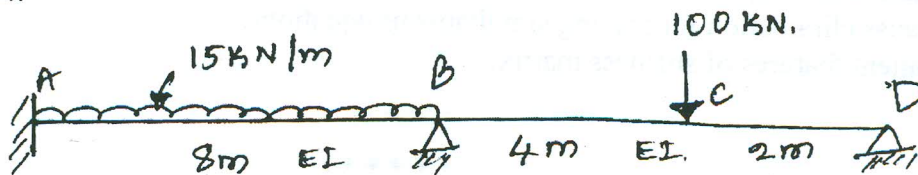
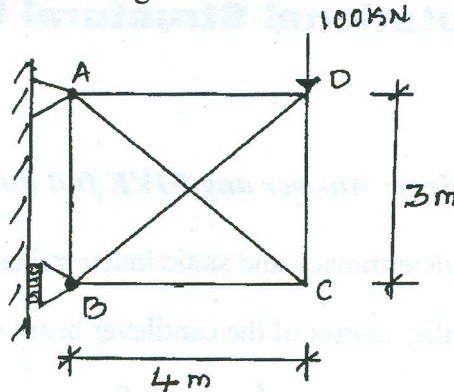


Fig.4

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

- 5 Analyze the pin jointed truss given in Fig.5 for the forces in the members for the given loading by flexibility method. Refer Fig.5. (20 Marks)



'A' and 'E' are same for all the members.

Fig.5

- 6 Analyze the continuous beam by stiffness method. Refer Fig.6. (20 Marks)

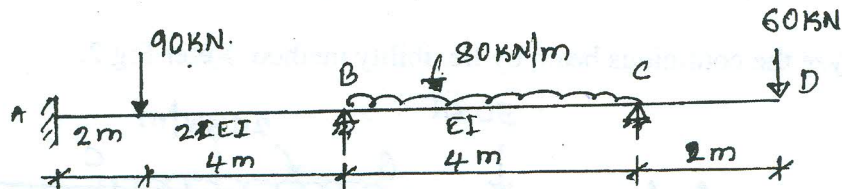


Fig.6.

- 7 Analyze the given frame by stiffness method. 'EI' is same for all members. Refer Fig.7. (20 Marks)

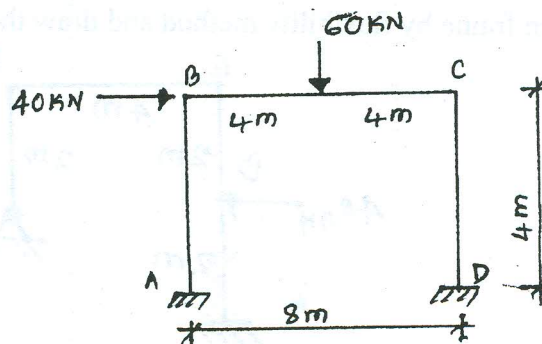


Fig.7.

- 8 Explain the following :
- Principle of contragradience.
 - Band width minimization.
 - Gauss elimination for solving simultaneous equations.
 - Salient features of stiffness matrix.

(20 Marks)
