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10CV751

**Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Matrix Methods of Structural Analysis**

Time: 3 hrs.

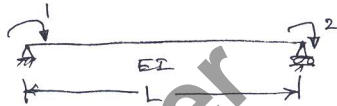
Max. Marks:100

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

**PART - A**

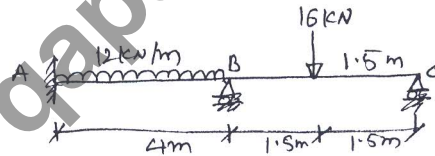
- 1 a. Explain the following in brief:
  - i) Static and kinematic indeterminacy
  - ii) Principle of super position
  - iii) Member flexibility matrix
  - iv) Force transformation matrix
  - v) Principle of contragradience. (10 Marks)
- b. Develop element flexibility matrix for the shown coordinates on an element shown in Fig.Q.1(b). (10 Marks)

Fig.Q.1(b)



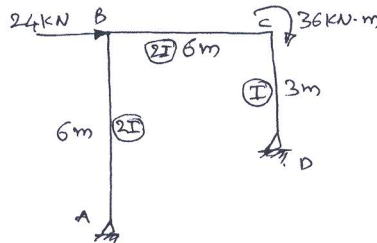
- 2 Analyze the continuous beam by force transformation approach and sketch BMD. Use moment at 'A' and reaction at 'B' as redundants. Take EI – constant. Refer Fig.Q.2. (20 Marks)

Fig.Q.2



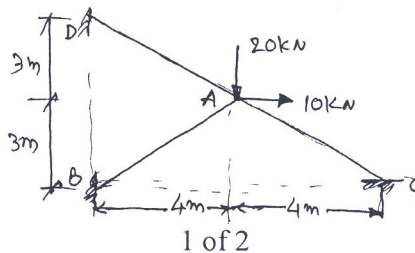
- 3 Analyze the rigid frame shown in Fig.Q.3 by force transformation approach and draw BMD. (20 Marks)

Fig.Q.3



- 4 Analyze the pin jointed indeterminate truss shown in Fig.Q.4 by element flexibility method. Take AE – constant. (20 Marks)

Fig.Q.4



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 pin-jointed truss shown in Fig.Q.5. (20 Marks)

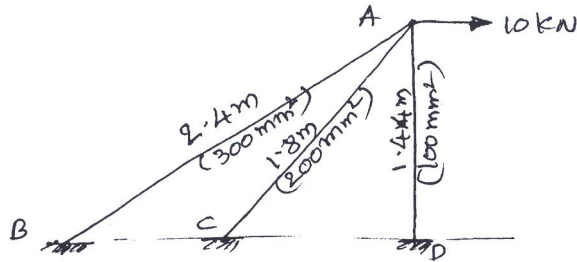


Fig.Q.5

- 6 Draw BMD for the continuous beam shown in Fig.Q.6 by using displacement transformation approach. (20 Marks)

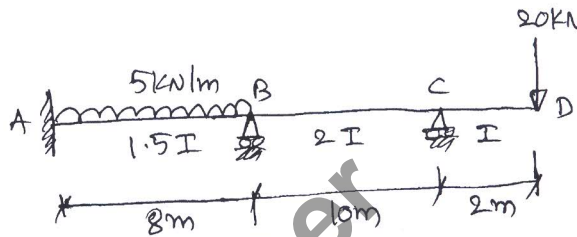


Fig.Q.6

- 7 Analyze the frame by displacement transformation approach. Draw BMD. Refer Fig.Q.7. (20 Marks)

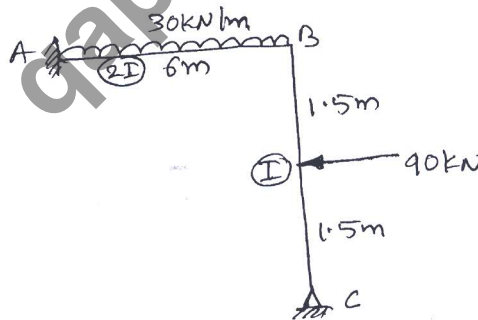


Fig.Q.7

- 8 Analyze the continuous beam shown in Fig.Q.8 by direct stiffness. Take EI constant. Draw BMD. (20 Marks)

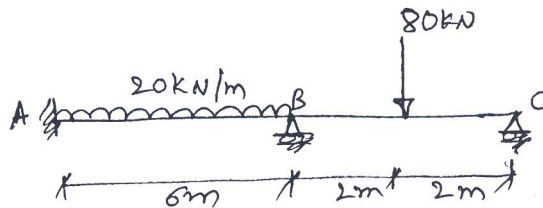


Fig.Q.8

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