M.Tech 1st Semester Civil Engg. (Specialisation in Structural Design) Examination,

December–2017

ADVANCED STRUCTURAL ANALYSIS

Paper-CE-611 MTSD-102

Time allowed : 3 hours] *[Maximum marks : 100*

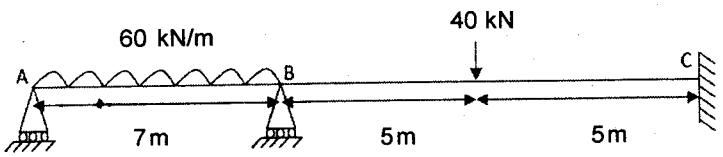
Note : *Attempt any **five** questions. Assume any data, if missing.*

1. Explain the following in detail : 20

(a) How do the flexibility and stiffness matrices depend on static and kinematic indeterminacies ?

(b) The stiffness matrix of a liner elastic structure is symmetric. Why ?

2. Analyze the continuous beam shown by flexibility method in which support reaction at A and B are treated as the redundant. Hence, calculate the bending moment at B. Assume flexural rigidity EI as constant for all the beams. 20



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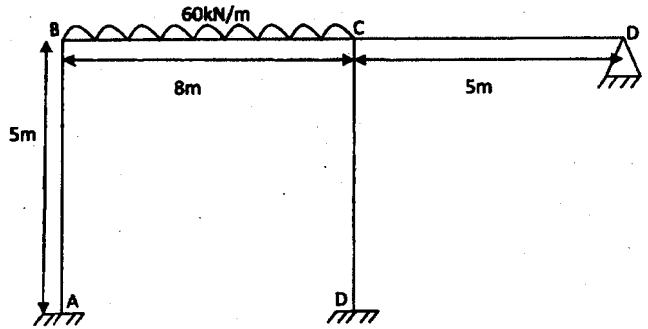
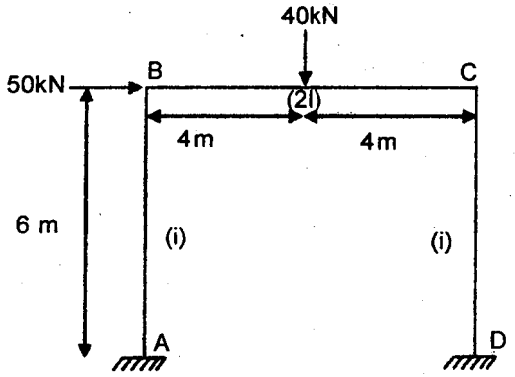
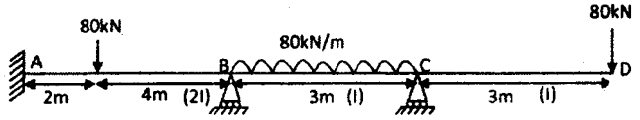
3. Using stiffness matrix method, analyse the frame shown in fig. Take EI constant throughout. 20



4. Analyze the rigid frame shown in fig. given below by flexibility matrix method. 20

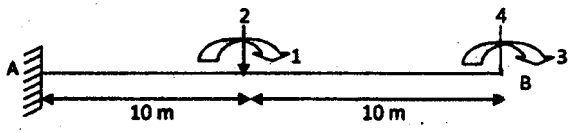


5. Analyze the beam by stiffness matrix method. 20



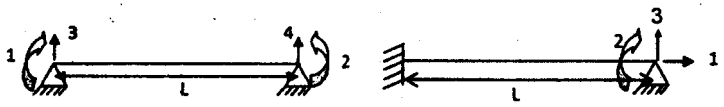
6. (a) Write down the relationship between stiffness matrix and flexibility matrix. 20

(b) Develop the stiffness matrix for beam AB with reference to co-ordinate shown in fig.



EI Constant

7. For simply supported beam of uniform cross-section as shown, develop the flexibility matrix with reference to co-ordinate shown in fig.



8. What do you understand by stiffness method of analysis ? Also explain why stiffness method is also called as displacement method in detail.

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