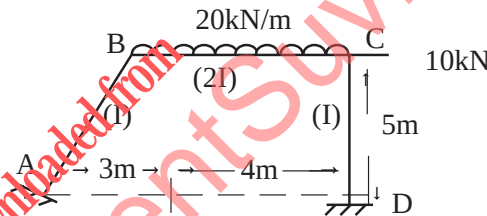


MVSE-103
M.E./M.Tech. I Semester
 Examination, June 2020
Advance Structural Analysis
Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
 ii) All questions carry equal marks.
 iii) Assume missing data suitably.

1. a) Explain number coordinate and global coordinate system.
 b) Develop stiffness matrix for space truss structure.
2. a) Explain the term static indeterminacy in a structure with the help of two examples.
 b) Explain the transformation in the flexibility analysis of a member.
3. Differentiate between the Force and Displacement method of Structural Analysis.
4. a) Write short note on the 'Process of Discretization'.
 b) Derive the shape function of three noded beam using usual notations.
5. Analyse the portal frame with inclined leg shown below.



6. Why the stiffness matrix method also called equilibrium method or displacement method?
7. Calculate the support reaction and joint displacement for a portal frame of width 3 m and height 3 m with fixed support at the base. Frame is loaded with uniformly distributed load of 2 kN/m acting at the top beam. Take $E = 200 \text{ GPa}$.
8. Write short notes on (any four)
 - a) Principal of superposition
 - b) Relationship between flexibility and stiffness matrices
 - c) Equivalent joint loads
 - d) Stiffness matrix for grid structure
 - e) Maxwell Reciprocal theorem
