

Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, December 2016
(2013 Scheme)**

13.703 : ADVANCED STRUCTURAL ANALYSIS (C)

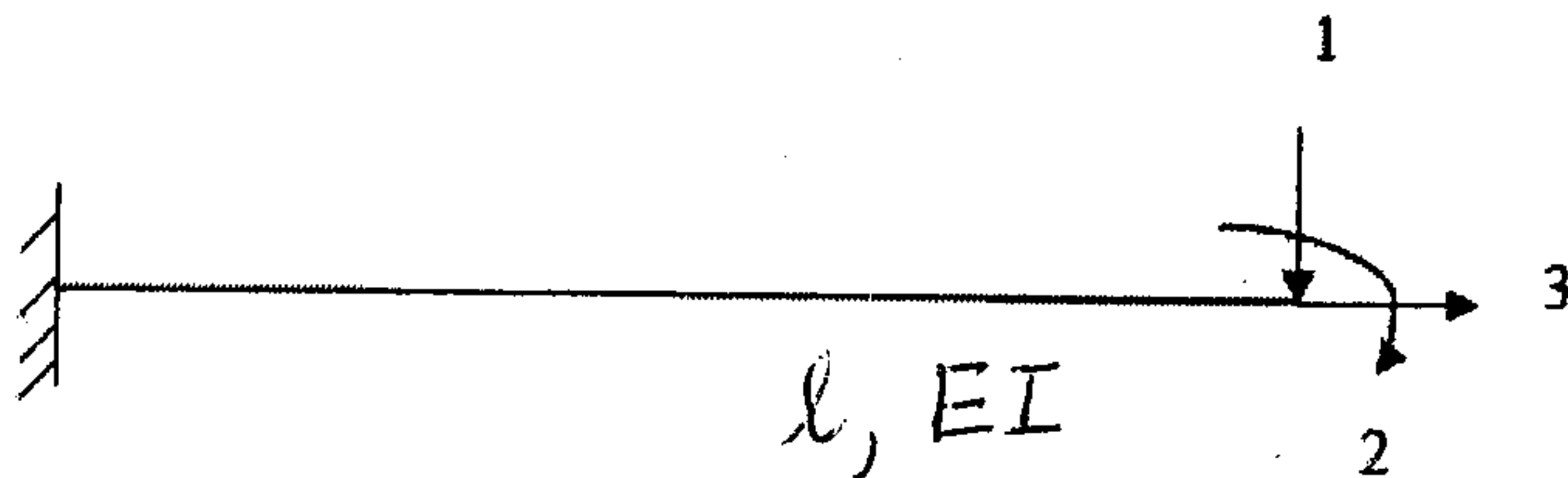
Time: 3 Hours

Max. Marks: 100

Instruction : Answer *all* questions from Part – A and *any one* question from *each* Module in Part – B.

PART – A

1. a) State and explain static indeterminacy and kinematic indeterminacy with examples.
- b) Derive the stiffness matrix for the element as shown in the figure.

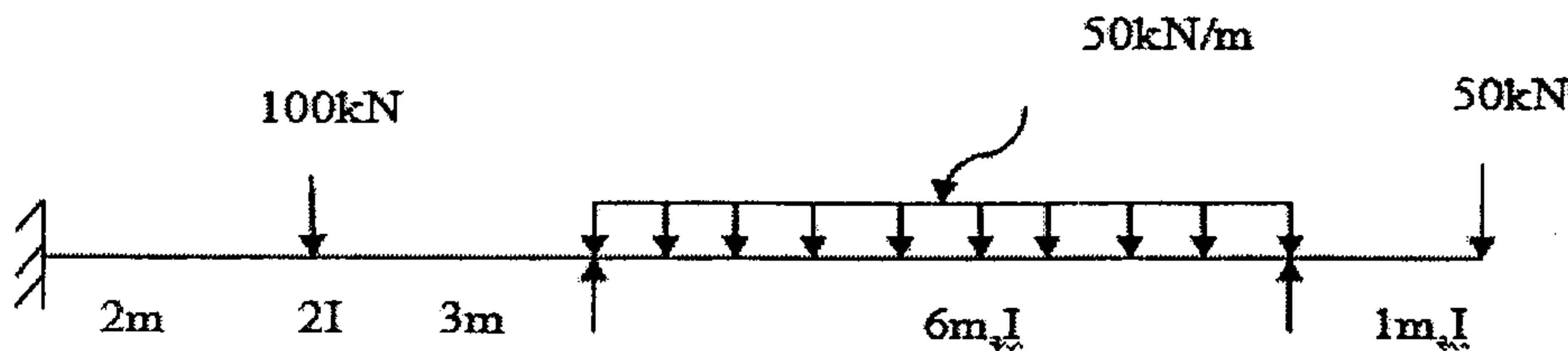


- c) Compare Stiffness method and Flexibility method.
- d) Differentiate between displacement transformation matrix and force transformation matrix.
- e) Differentiate between local and global co-ordinate systems. **(5×4=20 Marks)**

**PART – B
Module – I**

(4×20=80 Marks)

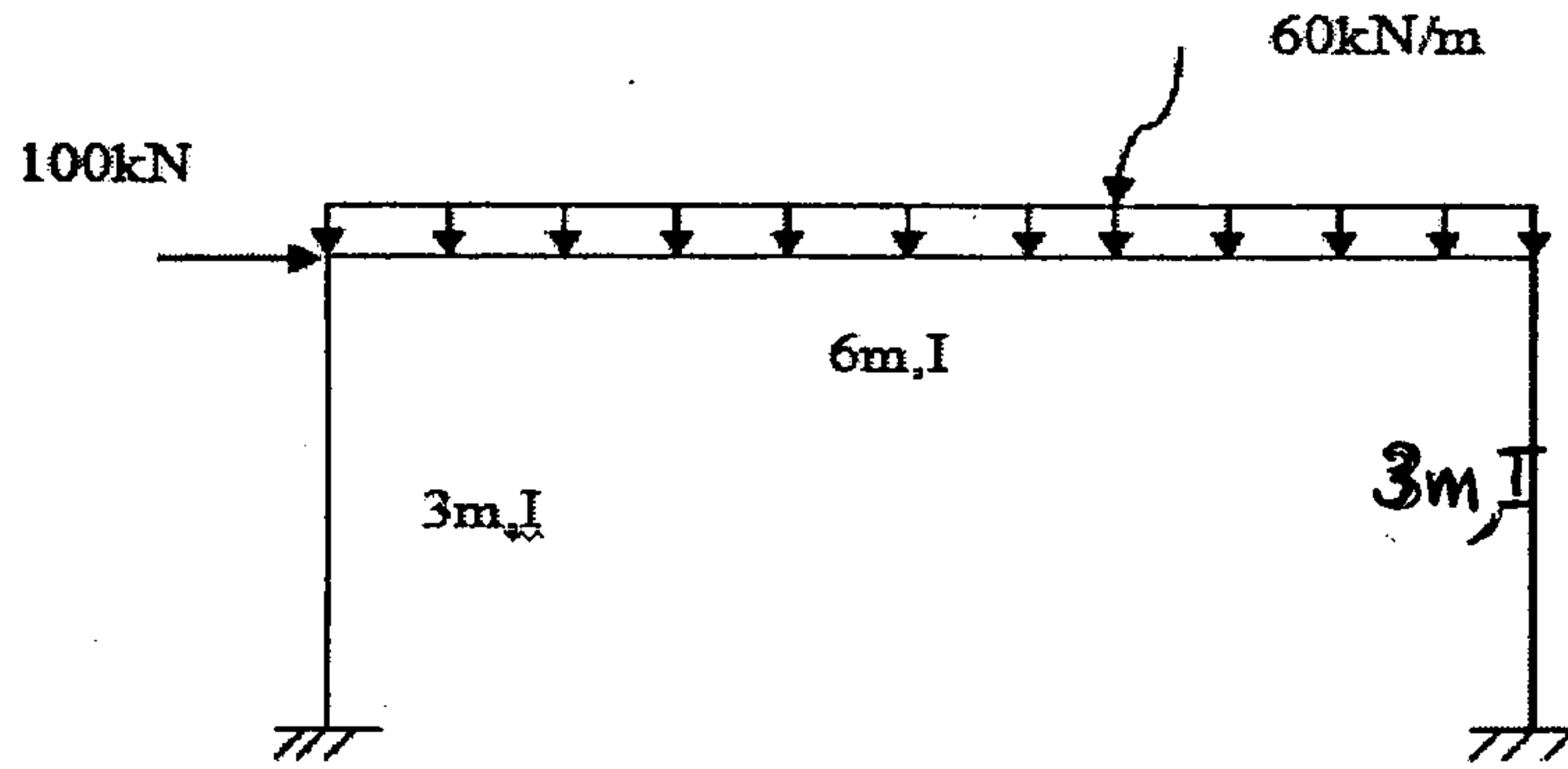
2. Analyse the continuous beam as shown below by Stiffness method and draw BMD and SFD.



P.T.O.

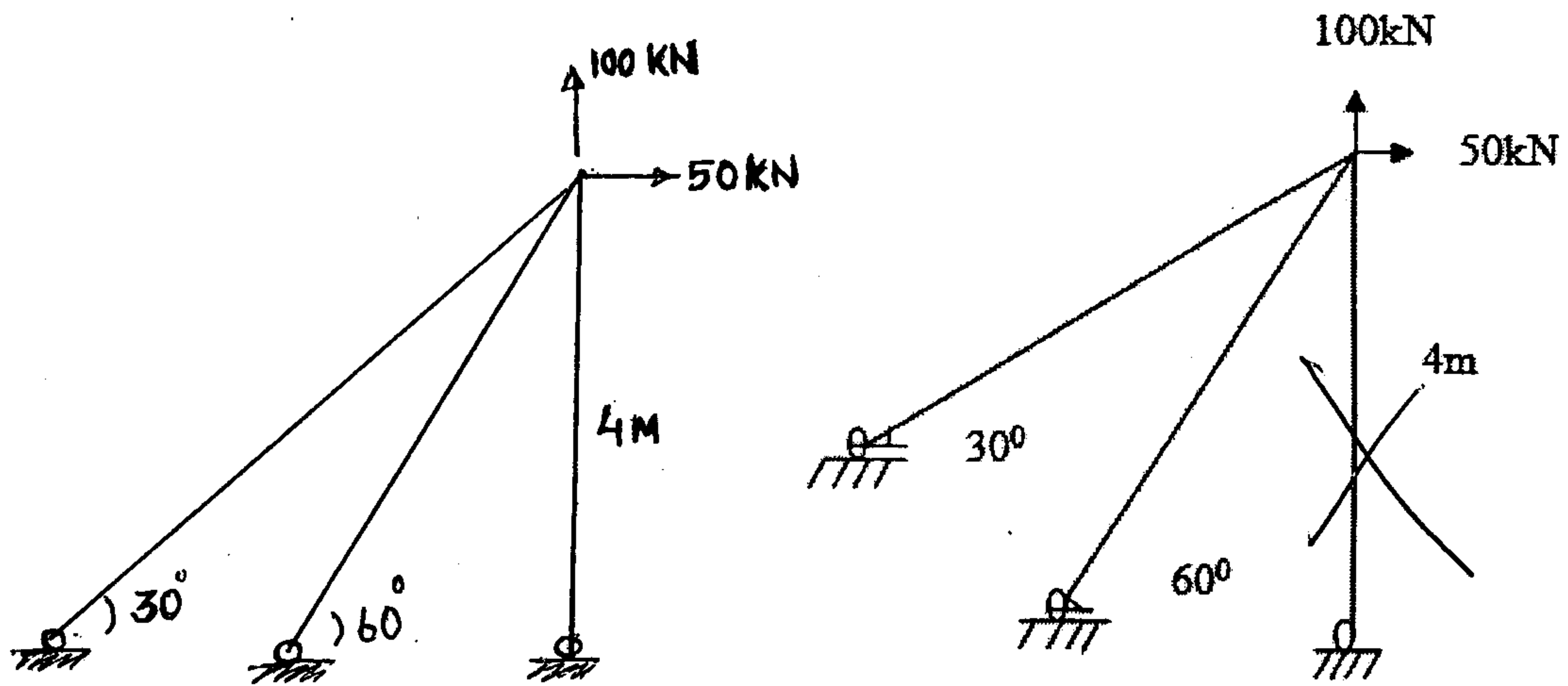


3. Analyse the rigid jointed frame by Stiffness method and draw BMD.



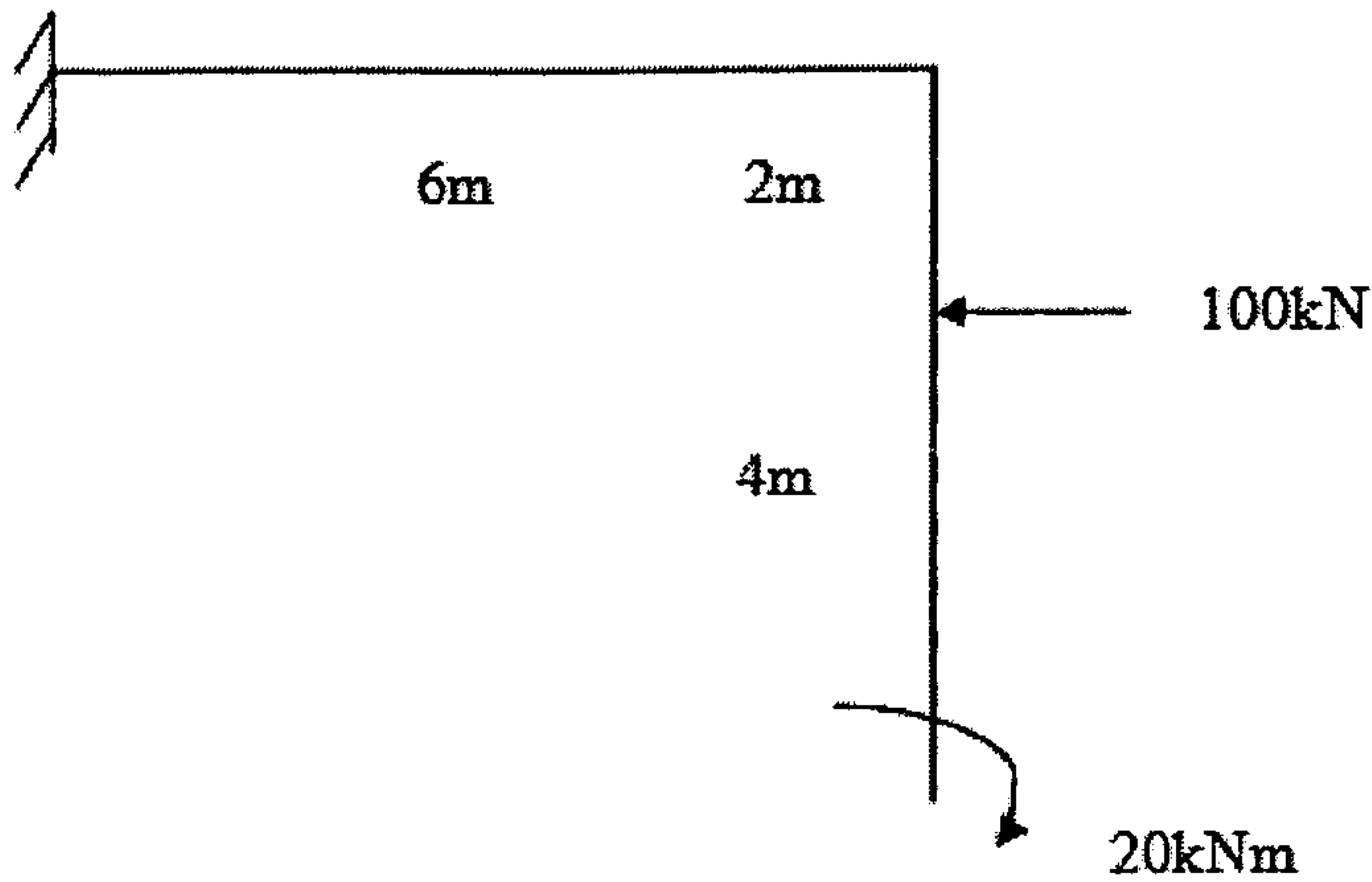
Module - II

4. Find the member forces in the truss given below by direct Stiffness method. Take A and E same for all the members.



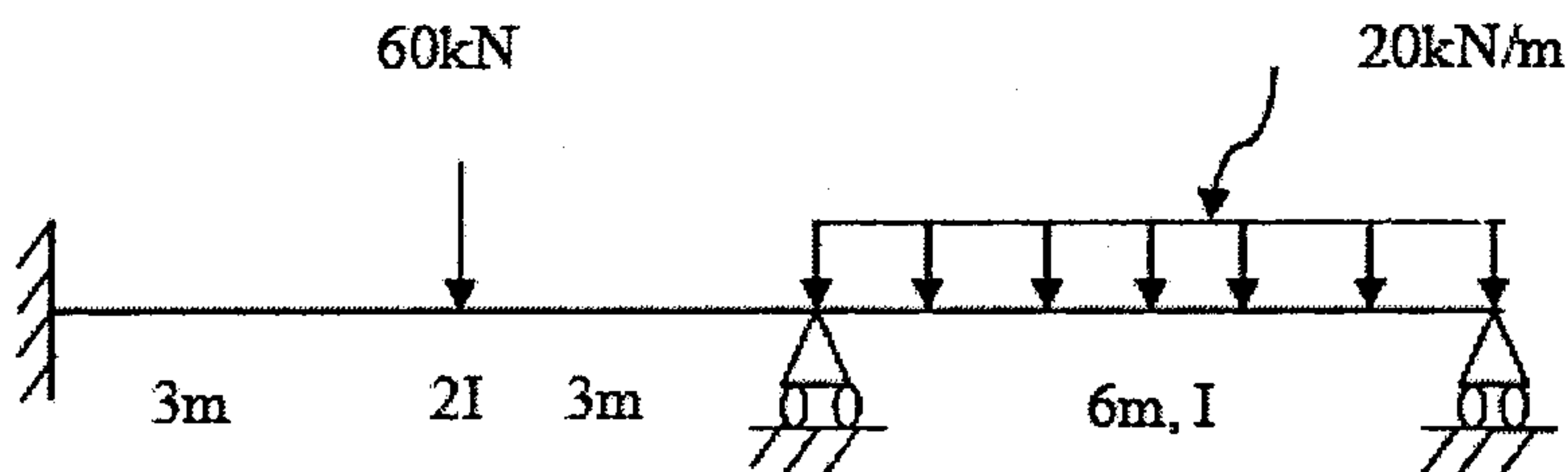


5. Find the horizontal deflection at the free end and under the load of the frame shown in figure by flexibility method. Take EI constant.

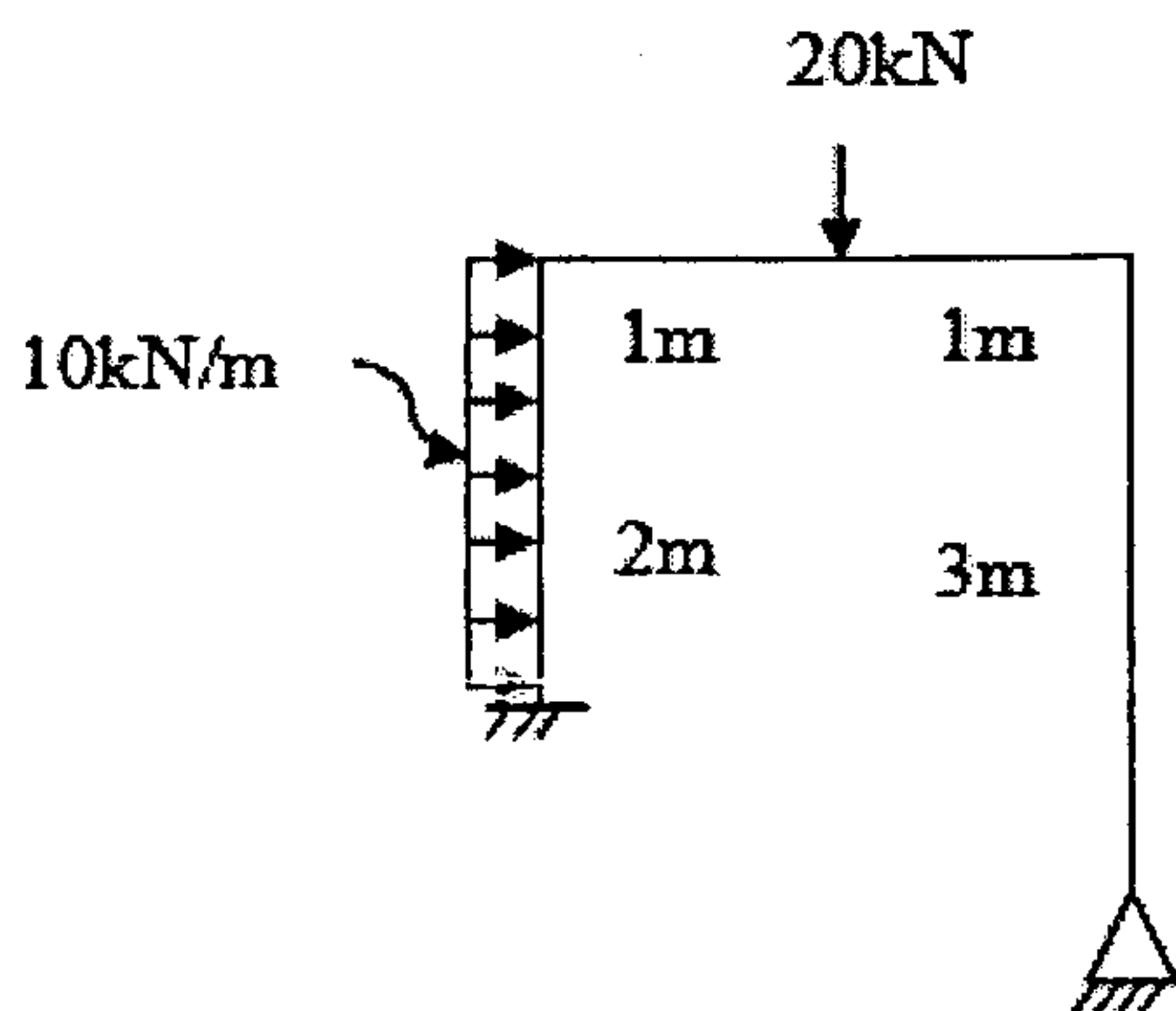


Module – III

6. Analyse the continuous beam shown in figure by flexibility method and draw the SFD and BMD.



7. Analyse the rigid jointed plane frame shown in figure by flexibility method and draw BMD. Take EI constant.



**Module – IV**

8. a) Develop the Stiffness matrix for a 2 noded truss element with an axial displacement at each node. **10**
- b) Find the natural co-ordinates of point P (1.5, 1.5) of the CST element and hence find the displacement of point P using the following data :

No.	1	2	3
Coordinate	(1, 1)	(3, 1)	(2, 2)
Displacement	100	215	325

10

9. a) Derive the expression for stiffness matrix in Finite Element Method from fundamental principles. **15**
- b) Discuss the convergence requirements of displacement functions. **5**

