

Roll No .....

**MVSE - 103****M.E./M.Tech., I Semester**

Examination, June 2014

**Advance structural Analysis****Time : Three Hours****Maximum Marks : 70**

8. a) Explain :

- i) Local and global coordinate system;
- ii) Rotation transformation matrix and
- iii) Boundary conditions.

b) Explain how the overall stiffness matrix is developed for the given structure.

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- Note :** 1. Attempt any five questions.  
 2. All questions carry equal marks.  
 3. Assume suitable value for missing data if any.

1. a) Develop the flexibility matrix of the element shown with reference to the coordinates given in Fig.1(a) and Fig.1(b).



Fig.1(a)

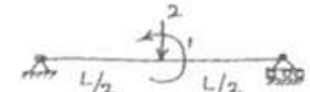


Fig.1(b)

- b) Explain (i) principle of contragradience and (ii) force transformation matrix.
2. A continuous beam ABC is loaded as shown in Fig.2. It has constant flexural rigidity, fixed support at A, roller support at B and guided support at C. Analyse the beam using flexibility method.

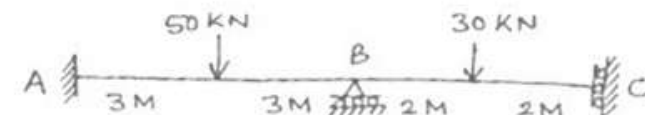


Fig.2

[2]

3. Analyse the rigid plane frame shown in Fig.3 by flexibility matrix method. Draw bending moment diagram. Take  $EI$  as constant.

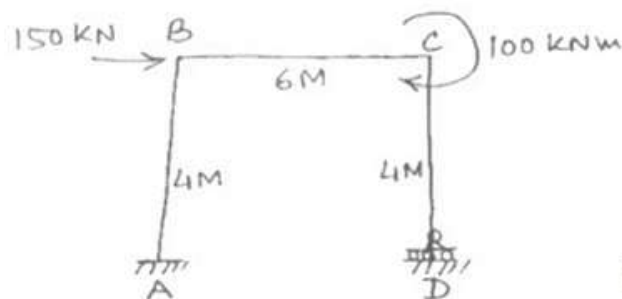


Fig.3

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4. Determine the member forces in the plane truss shown in Fig.4 by flexibility method. Take member AC as redundant and  $AE$  as constant.

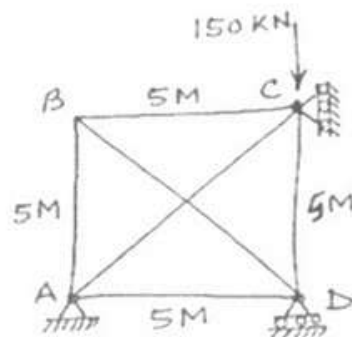


Fig.4

5. Analyse the beam AB, having internal hinge at C as shown in Fig.5. Use stiffness method.  $EI$  is the flexural rigidity of the beam.



Fig.5

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[3]

6. Analyse the rigid plane frame shown in Fig.6 by stiffness matrix method. Draw bending moment diagram. Take  $EI$  as constant.

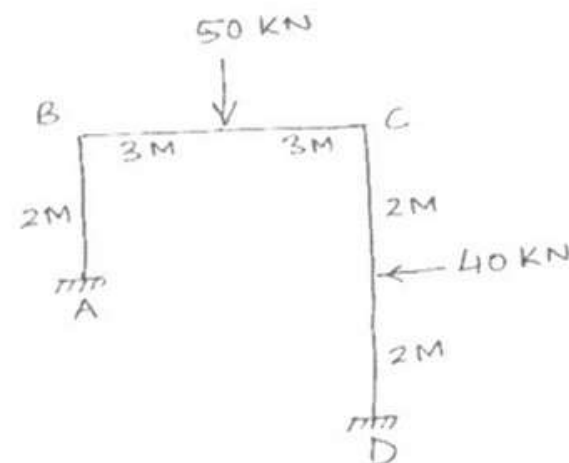


Fig.6

7. Analyse the truss shown in Fig.7 by direct stiffness method.

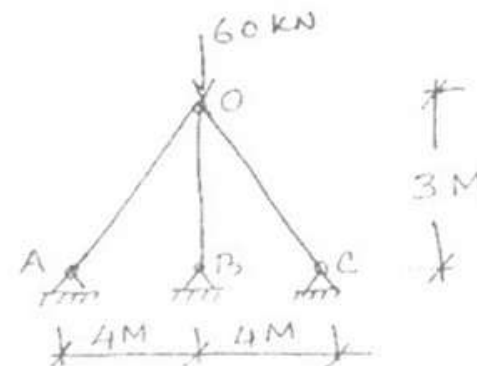


Fig.7