

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 711501**Date: 13-06-2014****Subject Name: Matrix Analysis of Framed Structures****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** Analyze the beam shown in fig. 1 by stiffness member approach. Plot internal force diagrams **14**
- Q.2 (a)** Derive the transformation matrix for truss member. **07**
(b) Explain the nonlinear analysis in structural analysis with examples. **07**
- OR**
- (b)** Derive the stiffness matrix for space frame member. **07**
- Q.3** Analyze the beam shown in fig. 2 by flexibility member approach. Plot internal force diagrams **14**
- OR**
- Q.3** Analyze the plane frame shown in fig. 3 by flexibility member approach. Plot bending moment diagram only. **14**
- Q.4** Analyze the grid structure shown in fig. 4 by stiffness member approach. Plot bending moment diagram. **14**
- OR**
- Q.4** Analyze the plane frame shown in fig. 3 by stiffness member approach. Plot bending moment diagram. **14**
- Q.5** Analyze the truss shown in fig. 5 by stiffness member approach. Plot bending moment diagram only. **14**
- OR**
- Q.5** Write the analysis steps for space truss shown in fig. 6 by stiffness member approach and find the global stiffness matrix. **14**

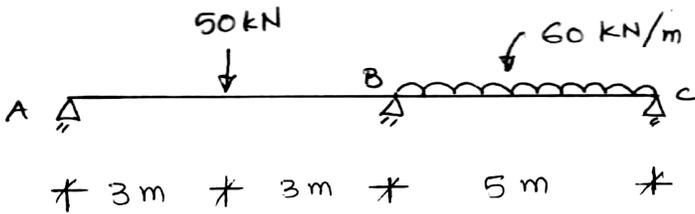


Fig. 1 (Q. 1)

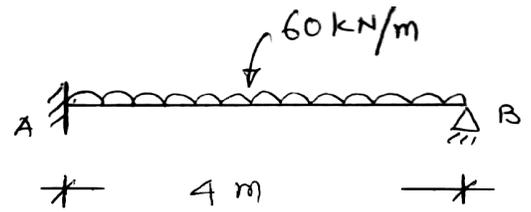


Fig. 2 (Q. 3 (a))

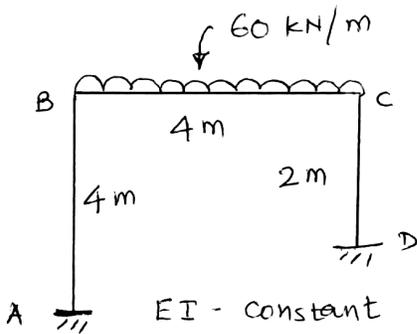


Fig. 3 (OR Q. 3 and OR Q. 4)

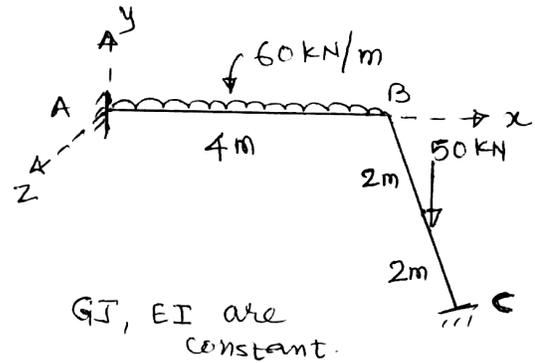


Fig. 4 (Q. 4)

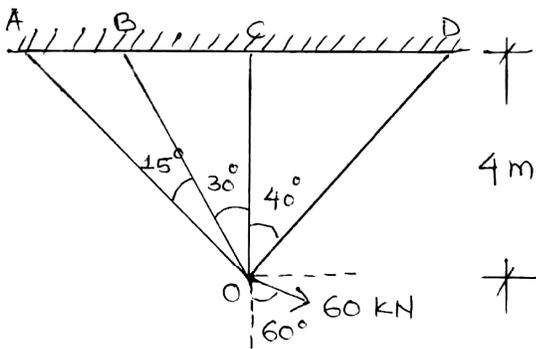
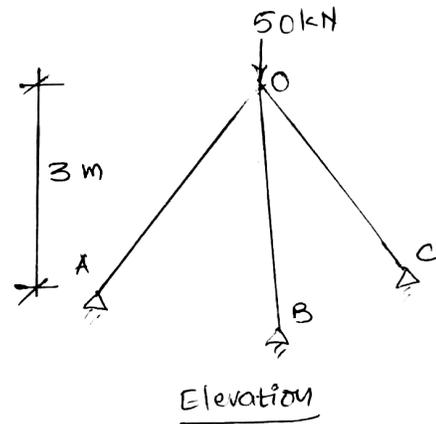
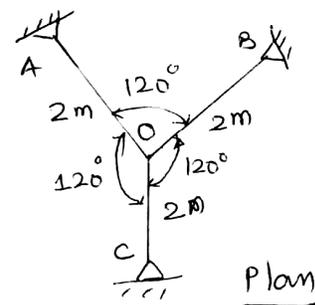


Fig. 5 (Q. 5)



Elevation



Plan

Fig. 6 (OR. Q. 5)
