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Total Number of Pages : 02

M.TECH

**M.TECH 1<sup>ST</sup> SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017**  
**MATRIX METHODS OF ANALYSIS OF STRUCTURES**

Branch: SE, Subject Code:MSEPC1030

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

**PART-A**

**( 2X10=20 MARKS)**

**1. Answer the following questions .**

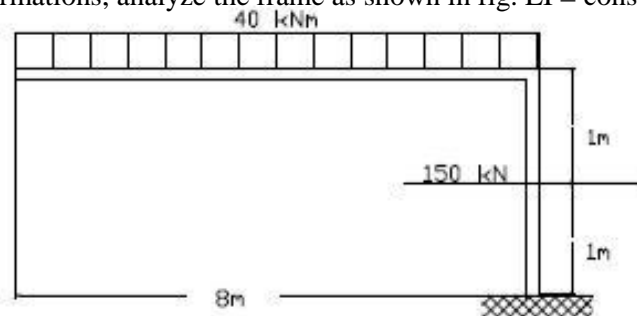
- What do you mean by response of a structure?
- What do you mean by equilibrium of forces?
- What are the levels of structural analysis?
- What do you mean by kinematic indeterminacy?
- What do you mean by degree of freedom?
- What do you mean by principle of superposition?
- How the structures are classified?
- Define equivalent joint load in matrix method of analysis?
- What are the basic unknowns in matrix method of analysis?
- What do you mean by force method in matrix analysis?

**PART-B**

**(5 X 10=50 MARKS)**

**Answer any five questions from the following.**

2. a. Neglecting axial deformations, analyze the frame as shown in fig.  $EI = \text{constant}$ .

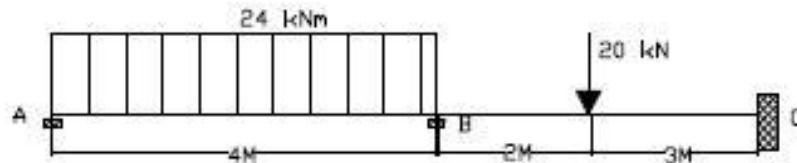


- Draw Shear Force Diagram and Bending Moment Diagram
3. a. Analyze the truss having a square form of bars of 3m lengths with both diagonal members. The truss is supported on hinge and roller at bottom joints. A 20 kN load acts on the truss at its right and top corner towards left. The members are of same cross sectional area and  $EI = \text{constant}$ . Use

flexibility method of matrix analysis.

b. Differentiate between equilibrium and compatibility.

4. a. Analyze the beam by flexibility matrix method.  $EI = \text{constant}$ .



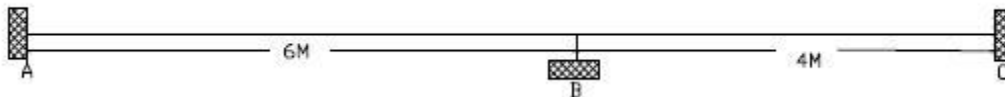
b. Draw Shear Force Diagram and Bending Moment Diagram.

5. a. Analyze the continuous beam having three spans each of 3m length by stiffness matrix method.

Extreme ends are fixed and intermediate supports are roller supports. The beam carries 20 kN concentrated loads at mid-point of each span.  $EI = \text{constant}$ .

b. Draw Shear Force Diagram and Bending Moment Diagram.

6. a. Analyze the beam if support B sinks by 30mm.



b. Draw Shear Force Diagram and Bending Moment Diagram.

7. a. What do you mean stiffness method of matrix analysis?

b. What are the steps involved to solve the problem by using this method

8. Write short notes on the following:

a. Unit load method.

b. Static and kinematic indeterminacies

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