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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

M.Tech I Year I Semester Regular & Supplementary Examinations May/June-2022
ADVANCED STRUCTURAL ANALYSIS

(Civil Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

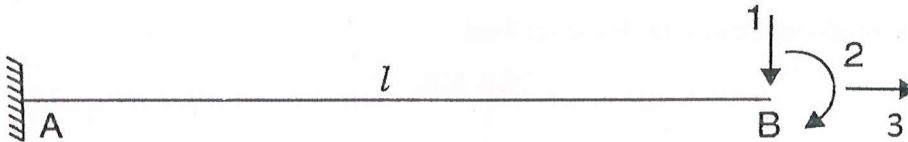
UNIT-I

1 Explain briefly about Stiffness matrix method of Analysis L2 12M

OR

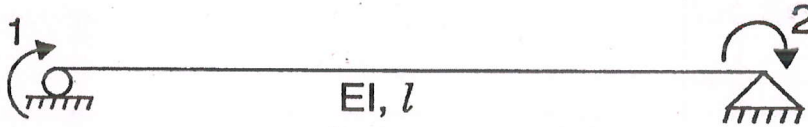
2 a L3 6M

Find the flexibility matrix of the cantilever shown below. EI is constant.



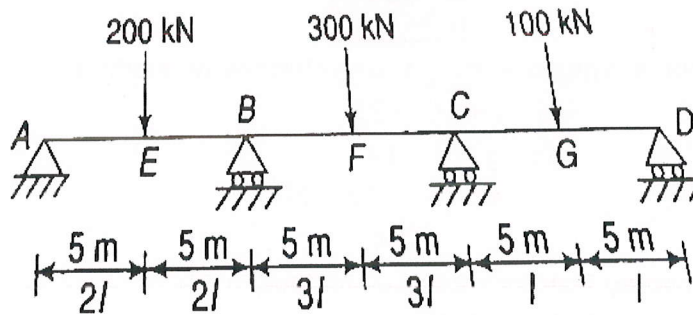
b L3 6M

Develop the flexibility matrix for the simply supported beam shown below.



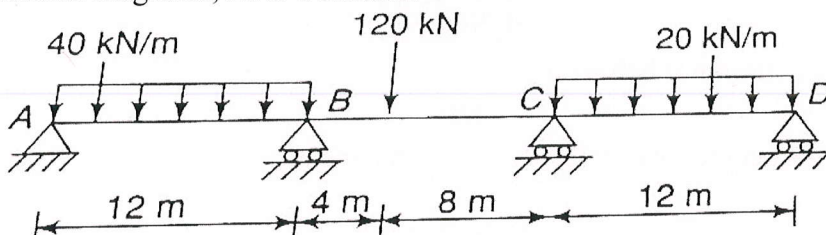
UNIT-II

3 Analyze the continuous beam shown below by Flexibility method. The downward settlement of supports B and C in kN-m are 1500/EI and 750/EI. L3 12M



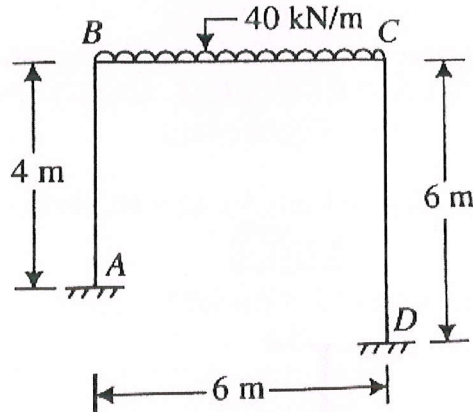
OR

4 Using flexibility matrix method for the beam shown below and draw shear force and bending moment diagrams, EI is Constant. L3 12M



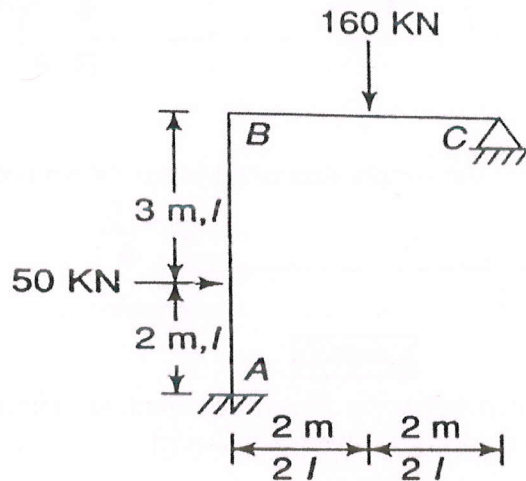
UNIT-III

- 5 Analyse the rigid jointed plane frame shown below by flexibility matrix method. EI is constant throughout. **L3 12M**



OR

- 6 Analyze the frame shown below by force method. **L3 12M**



UNIT-IV

- 7 Solve the following system of equations using Gauss elimination method. **L3 12M**

$$\begin{aligned} -4x + y + 10z &= 21 \\ 5x - y + z &= 14 \\ 4x + 6y + 7z &= 12 \end{aligned}$$

OR

- 8 Determine the solution by using Gauss elimination method. **L3 12M**

$$\begin{aligned} 2x_1 - 2x_2 + 4x_3 &= -3 \\ 2x_1 + 3x_2 + 2x_3 &= 5 \\ -x_1 + x_2 - x_3 &= 1 \end{aligned}$$

UNIT-V

- 9 Write about nonlinear structural behavior. **L2 12M**

OR

- 10 Derive the equation of geometrical stiffness for beam elements. **L2 12M**

*** END ***