

COURSE CODE (CREDITS): 18B1WCE631 (3)

MAX. MARKS: 35

COURSE NAME: Advanced Structural Analysis

COURSE INSTRUCTOR: Mr. Chandra Pal Gautam

MAX. TIME: 2 Hours

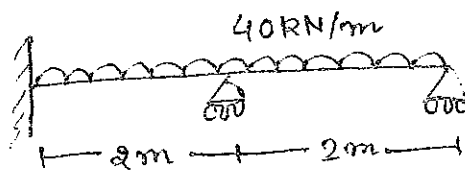
Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. (i) Define flexibility and stiffness of member.

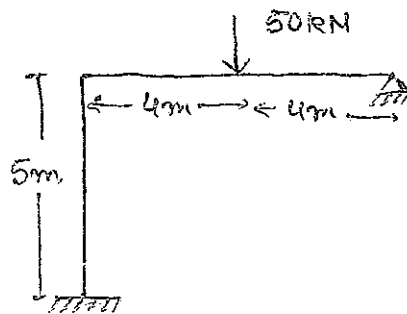
(ii) How the flexibility and stiffness are related with each other. Find the flexibility and stiffness of bar hanging from a fixed support with an axial load of P . Assume area of bar as 'A', modulus of elasticity as 'E' and length of bar 'L'.

(iii) Why flexibility matrix method is not used in design software's. [2+2+1 = 5]

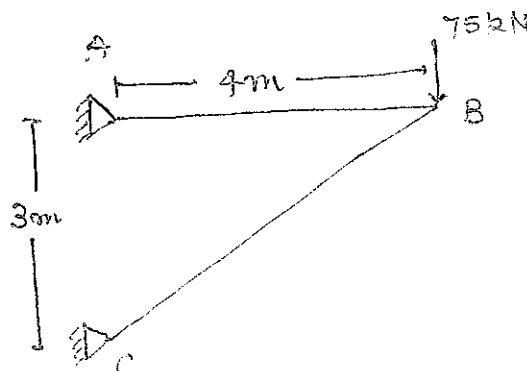
Q2. For the given beam find the support reactions by using Flexibility Matrix Method. [7]



Q3. For the given frame, derive the flexibility matrix in term of EI. [6]

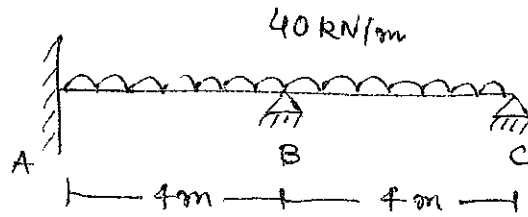


Q4. For the given truss find the support reactions and displacement at B along x axis by using Stiffness Matrix Method. Assume $A = 200 \text{ mm}^2$ and $E = 200 \text{ GPa}$ for all members. [6]



Q.5. For the given beam find the support reactions and slope at B by using Stiffness Matrix Method.

[6]



$EI = \text{Constant}$

Q.6. Find the support reactions of the frame given below by using Approximate Method of Analysis.

[5]

