

**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)**



M.Tech. (First Semester – Regular/Supplementary) Examinations, January – 2026
**24MSEPE11011 – Matrix Method of Analysis of Structures
(Structural Engineering)**

Time: 3 hrs

Maximum: 60 Marks

**Answer ALL questions
(The figures in the right hand margin indicate marks)**

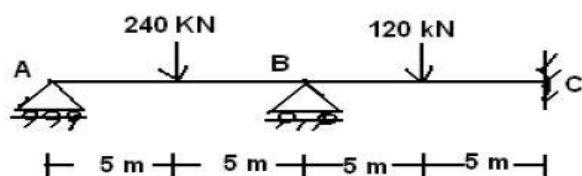
PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer <i>ALL</i> questions	CO #	Blooms Level
a. Define force method.	CO1	K2
b. Write the element stiffness matrix for a beam element	CO5	K2
c. Define equivalent joint load in matrix method of analysis.	CO2	K2
d. Explain degree of external indeterminacy.	CO3	K2
e. List the properties of the stiffness matrix.	CO4	K2

PART – B **(10 x 5 = 50 Marks)**

Answer *ALL* the questions

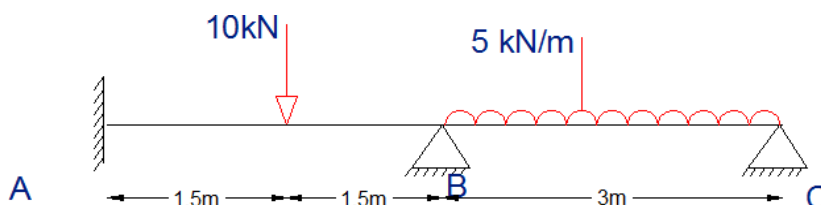
	Marks	CO #	Blooms Level
2. a. Differentiate between equilibrium and compatibility	5	CO1	K3
b. Explain Maxwell’s reciprocal theorem.	5	CO1	K2
(OR)			
c. State the comparison between force method and displacement method of analysis	5	CO1	K3
d. Explain flexibility method of matrix analysis?	5	CO1	K2
3.a. Analyze the continuous beam shown in figure using displacement method.			



10 CO5 K3

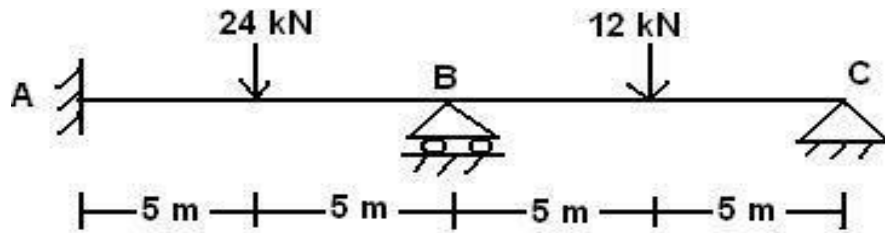
$EI = \text{constant}$
(OR)

b. Analyse the continuous beam ABC shown in fig by stiffness matrix method and draw the bending moment diagram.



10 CO5 K3

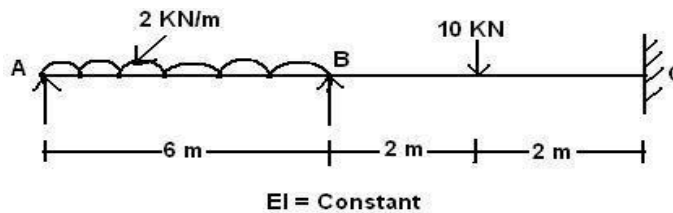
- 4.a. Analyse the continuous beam ABC shown in figure by flexibility matrix method and sketch the bending moment diagram



10 CO3 K3

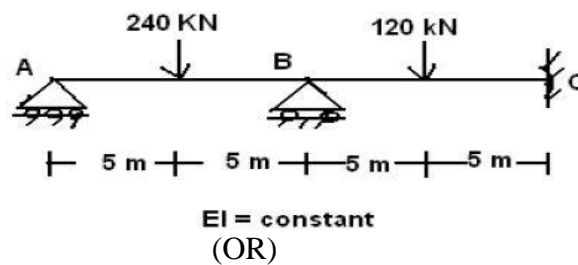
(OR)

- b. Analyse the continuous beam ABC shown in figure by flexibility matrix method



10 CO3 K3

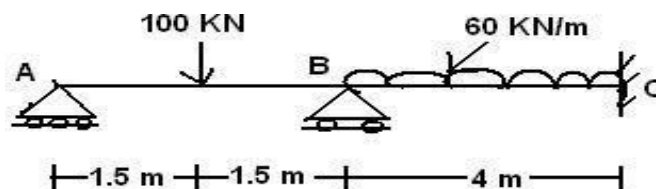
- 5.a. Analyse the continuous beam shown in figure using displacement method.



10 CO4 K3

(OR)

- b. Analyse the continuous beam shown in figure using force method



10 CO2 K3

- 6.a. Explain stiffness method of matrix analysis?

5 CO4 K3

- b. Apply stiffness method to outline the systematic steps required to solve a problem.

5 CO4 K3

(OR)

- c. Write short note on advantage of matrix method

5 CO2 K3

- d. Write short note on stiffness coefficients

5 CO4 K3

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