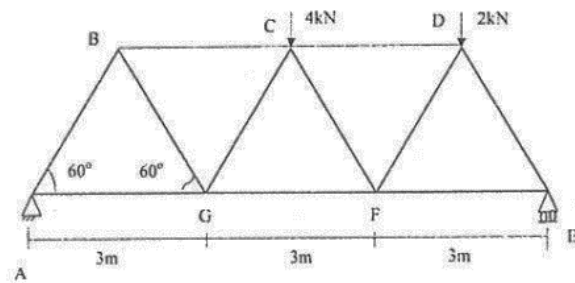


THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025***Fifth Semester**Civil Engineering***CE3502- Structural Analysis I***Regulations - 2021***Duration : 3 Hrs****Maximum : 100 Marks****PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

Q.No	Questions	BLT	CO	Marks
1.	Distinguish between statically determinate and statically indeterminate structure.	L3	1	2
2.	Give the equation that is used for the determination of deflection at a given point in beams and frames.	L1	1	2
3.	Outline the general slope-deflection equations and state what each term represents?	L2	2	2
4.	Summarize the reasons due to which sway may occur in portal frames.	L2	2	2
5.	Compare distribution factors and carry over factor.	L2	3	2
6.	In a member AB, if a moment of -10 kNm is applied at A. What is the moment carried over to B?	L1	3	2
7.	Make use of the compatibility condition.	L3	4	2
8.	Write the element Flexibility matrix for a beam member and truss member.	L1	4	2
9.	Is it possible to develop the flexibility matrix for an unstable structure?	L3	5	2
10.	Create the stiffness matrix for a 2D beam element.	L3	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11. a	Explain the steps involved in the determination of deflections of pin-jointed plane frames and rigid plane frames.	L3	1	16
Or				
b	Find the forces in the members AB, AG and BG by method of joints.	L3	1	16



12. a Analyze the continuous beam ABC shown in fig 2 by slope deflection method and sketch the BMD. Take $EI = \text{constant}$. L4 2 16

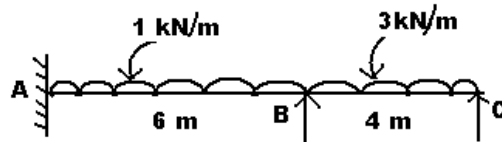


Fig 2

Or

- b A continuous beam ABC consists of spans AB and BC of 5 m length in each. Both ends of the beam are fixed. The span AB carries a point load of 15 kN at its middle point. The span BC carries a point load of 25 kN at its middle point. Solve the moments and reactions at the supports. Assume the beam is of uniform section. Use slope deflection method. L3 2 16
13. a A beam ABC 16 m long fixed at A and C and continuous over support B carries an udl of 3 kN/m over the span AB and a point load of 10 kN at mid span of BC. Span AB = 8 m and BC = 8 m. Take EI is constant throughout. Find the beam using moment distribution method. L3 3 16

Or

- b Solve the portal frame shown in fig 3 by moment distribution method. L3 3 16

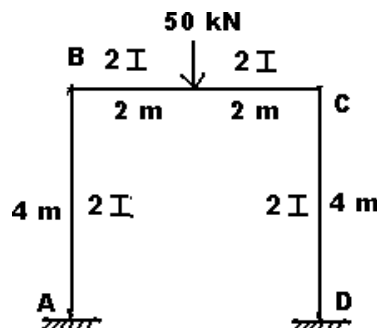


Fig 3

14. a Analyze the continuous beam ABCD shown in fig 4 below by flexibility matrix method and draw the bending moment diagram. M_B and M_C are redundant L4 4 16

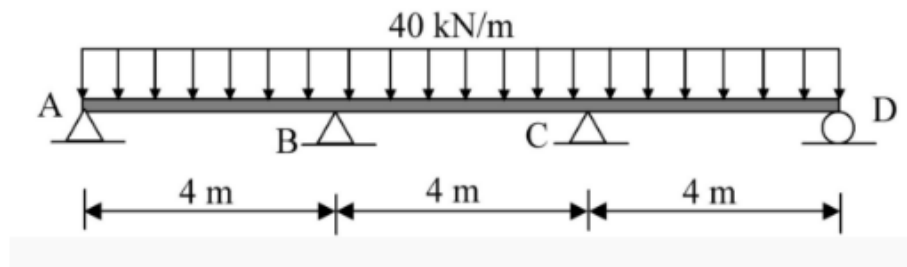


Fig 4

Or

- b Find the forces in all the members of the pin-jointed frames shown in Fig 5 below by flexibility method, $AE = \text{constant}$. L4 4 16

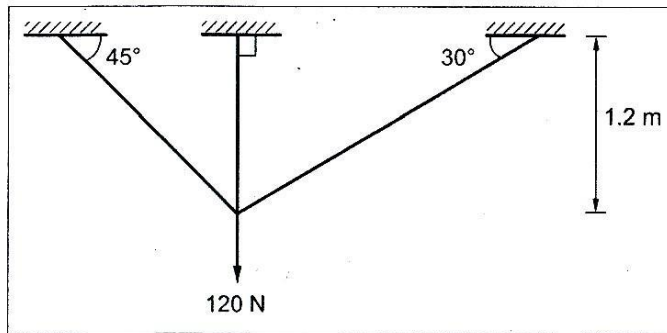


Fig 5

15. a A portal frame ABCD with A and D are fixed at same level span $AB=6\text{m}$ carries a uniformly distributed load of 20kN/meters . Span $BC = CD=5\text{m}$ carries uniformly distributed load of 5kN/m EI is constant throughout. Show the final forces by stiffness matrix method. L3 5 16

Or

- b A three span continuous beam ABCD is fixed at A and D and hinged at support B and C. Span $AB=BC=CD=5\text{m}$ carries uniformly distributed load of 8kN/m throughout the beam. Analyze by Stiffness Matrix method. L3 5 16