

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024****Subject Code:2150608****Date:14-05-2024****Subject Name:Structural Analysis-II****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) List the steps involved in analyzing an indeterminate truss using Castigliano's second theorem.	03
	(b) Derive an expression for displacement using Castigliano's first theorem.	04
	(c) Evaluate the vertical deflection under point C for the beam shown in the figure 1, using Castigliano's theorem. Take $EI = \text{constant}$.	07
Q.2	(a) List the assumptions made in slope deflection method.	03
	(b) Discuss limitations of the slope deflection method.	04
	(c) Analyze the beam shown in figure 2 using slope deflection method and draw bending moment diagram only.	07
OR		
	(c) Analyze the frame shown in the figure 3 using slope deflection method and draw bending moment diagram only.	07
Q.3	(a) Identify causes of sway in frames.	03
	(b) Demonstrate the analysis of a fixed beam using moment distribution method.	04
	(c) Analyze the beam shown in figure 2 using moment distribution method and draw bending moment diagram.	07
OR		
Q.3	(a) Explain how side sway is accounted for in moment distribution method.	03
	(b) Compare moment distribution and slope deflection methods for frame analysis.	04
	(c) Analyze the frame shown in figure-3 by Moment distribution method.	07
Q.4	(a) Differentiate between primary and secondary influence lines.	03
	(b) Illustrate the procedure to draw influence line for reaction of a simply supported beam.	04
	(c) Draw the influence line for reactions V_a , V_b , and V_c for the two span continuous beam having span $AB = 8\text{m}$ and $BC = 4\text{m}$. Compute ordinates at 2 m interval.	07
OR		
Q.4	(a) Identify uses of influence line diagrams.	03
	(b) Calculate maximum shear force and bending moment using influence line diagrams.	04
	(c) Draw influence line diagrams for support reactions of a simply supported beam.	07

- Q.5 (a) Explain various types of skeletal structures. 03
 (b) Explain the stiffness method for analyzing continuous beams. 04
 (c) Differentiate between stiffness and flexibility method 07
- OR**
- Q.5 (a) Define: 1)Action and 2)Displacement 03
 (b) Discuss advantages of matrix methods over classical methods. 04
 (c) For a cantilever beam, show that stiffness and flexibility matrices are reciprocal to each other. 07

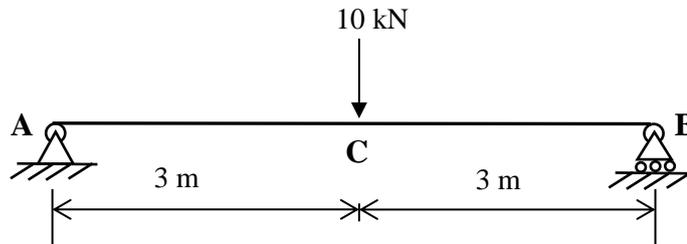


FIG-1

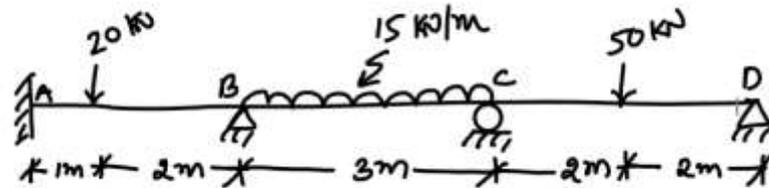


FIG.2

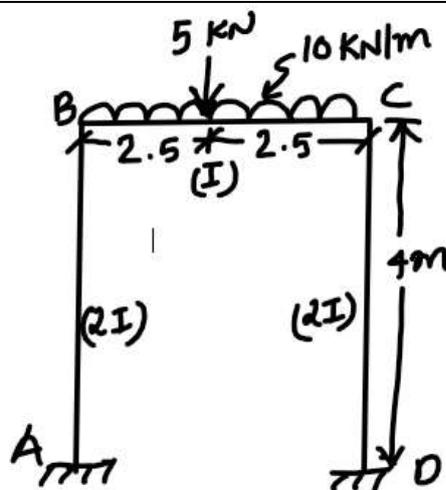


FIG.3