Sub Code: R2331014A **R23** **Set No. 1**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Regular Examinations November -2025
ADVANCED STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

The Question paper consists of Part A & Part B.
Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.
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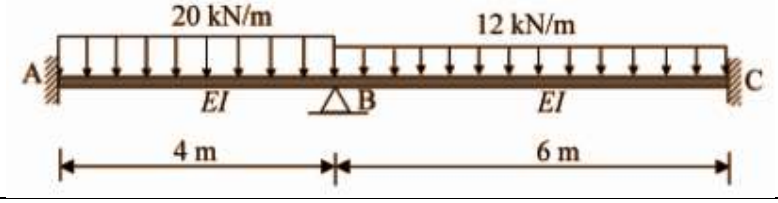
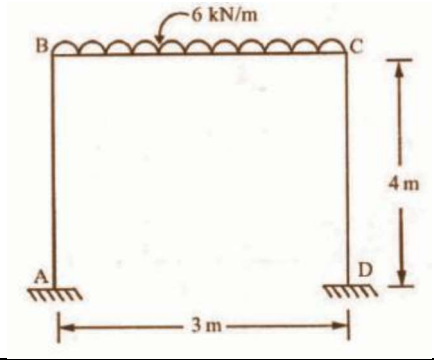
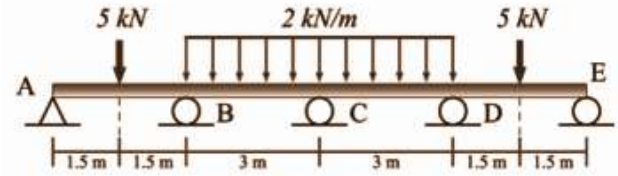
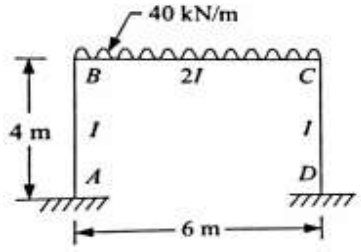
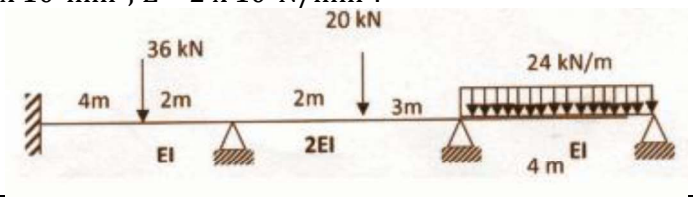
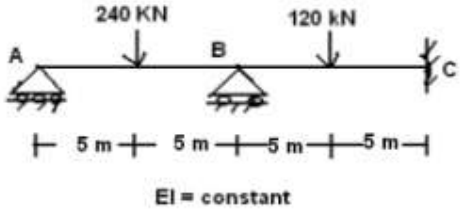
1		PART-A	(20Marks)
	a)	What are the assumptions made in the slope-deflection method?	[2]
	b)	What are the sign conventions used in the slope deflection method?	[2]
	c)	Define the Distribution factor	[2]
	d)	What is the difference between absolute and relative stiffness?	[2]
	e)	What are the advantages of Kani's method over the moment distribution method?	[2]
	f)	Explain the procedure for analyzing a continuous beam by Kani's method.	[2]
	g)	What are the basic unknowns in the stiffness matrix method?	[2]
	h)	Differentiate between flexibility and stiffness.	[2]
	i)	Define the flexibility coefficient.	[2]
	j)	Write the assumptions made for plastic analysis.	[2]
		PART-B	(50Marks)
		Unit - I	
2		Calculate the bending moments at A, B, and C for the two-span continuous beam ABC by slope deflection method. EI is constant. 	[10]
		(OR)	
3		Analyse the frame shown in the Fig. by the slope deflection method. EI is the same for all the members. 	[10]
		Unit - II	
4		Analyze the continuous beam using the moment distribution method and draw the bending moment diagram. EI = 2000kN.m^2. 	[10]
		(OR)	

5		Analyse the frame shown in the Fig. by the moment distribution method 	[10]
		Unit - III	
6		Analyze the continuous beam ABCD as shown in the figure using Kani's method. The support 'B' sinks by 4 mm, for the beam I = 13160 x 10^4mm^4; E = 2 x 10^5N/mm^2. 	[10]
		(OR)	
7		Analyze the portal frame by Kani's method. The two columns of AB and CD of 4m height with 2I, beam BC of span 5m, with I. The beam BC carries a udl of 20 kN/m. The supports at A and D are fixed. Draw the bending moment diagram.	[10]
		Unit - IV	
8		A three-span continuous beam ABCD is fixed at A and D and hinged at support B and C. Span AB=BC=CD=5m carries a uniformly distributed load of 8kN/m throughout the beam. Analyze by the stiffness matrix method.	[10]
		(OR)	
9		A portal frame ABCD with supports A and D fixed at the same level carries a concentrated load of 100kN at the centre of the span AB. Span AB=BC=CD=10m. EI is constant throughout. Analyze the frame by the stiffness matrix method.	[10]
		Unit - V	
10		Analyze the continuous beam ABC shown in Fig. below by the flexibility matrix method and draw the bending moment diagram. M_A and M_B are redundant. 	[10]
		(OR)	
11		A beam fixed at both ends is subjected to three concentrated loads "W", each at one-fourth points of the span. Determine the collapse load for the beam in terms of its M_P.	[10]

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