

Course Code: 23CE4T02SET-2

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)

II-B.Tech II-Semester Regular Examinations (BR23), Apr/May - 2025

STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3 hours

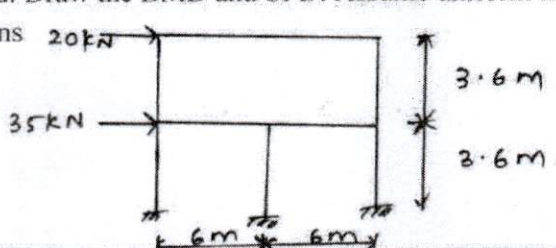
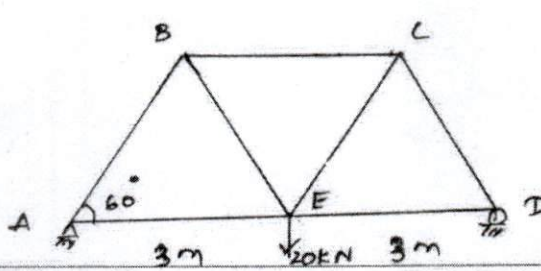
Max. Marks: 70

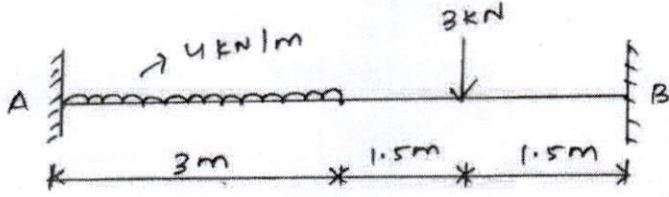
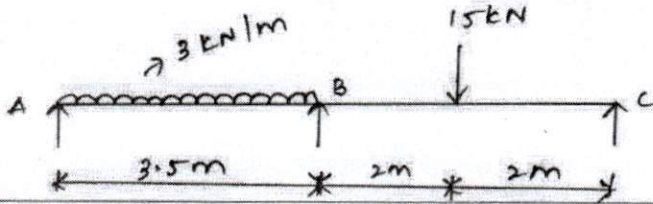
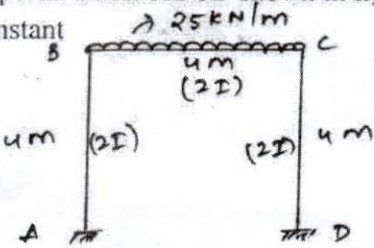
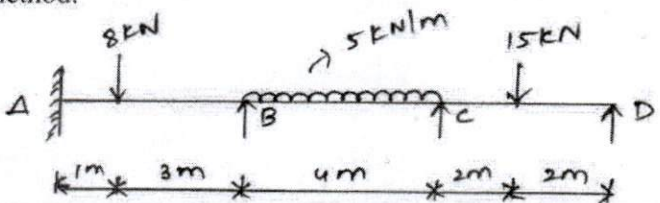
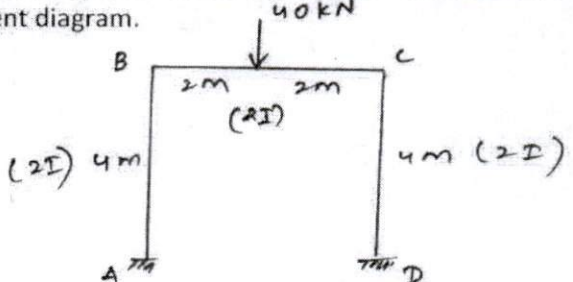
Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B

PART-A (10X2 = 20M)

		Marks	CO	BL
1. a)	Difference between cantilever and portal frame method	(2M)	CO1	BL2
b)	Define static indeterminacy. How is it calculated for a planar structure?	(2M)	CO1	BL2
c)	Draw the SFD and BMD for a fixed beam subjected to a central point load	(2M)	CO2	BL2
d)	Determine the static and kinematic indeterminacy for a two-span continuous beam.	(2M)	CO2	BL2
e)	How many slope-deflection equations are required for a continuous beam with 3 spans?	(2M)	CO3	BL2
f)	What is meant by chord rotation in the slope-deflection method?	(2M)	CO3	BL2
g)	What is a carryover factor and distributor factor in a moment distribution?	(2M)	CO4	BL2
h)	What is the effect of support settlement in the moment distribution method?	(2M)	CO4	BL2
i)	What are the characteristics of flexibility method?	(2M)	CO5	BL2
j)	What are the typical unknowns in a side-sway portal frame using Kani's method?	(2M)	CO5	BL2

PART-B (5X10 = 50M)

2	a) Explain analysis of a frame subjected to lateral load by adopting portal method	5(M)	CO1	BL2
	b) Analyze the two storey rigid moment resisting frame shown in Figure by Cantilever method. Draw the BMD and SFD. Assume uniform flexural rigidity of beams and columns 	5(M)	CO1	BL3
(OR)				
3	Determine the vertical deflection of joint 'E' for the truss shown in fig. take $A = 300 \times 10^{-6} \text{ m}^2$, $E = 200 \times 10^6 \text{ KN/m}^2$ are constant for bar members. Use strain Energy method. 	10(M)	CO1	BL3

4	<p>A fixed beam AB of length 6m carries a point load of 160kN and 120 kN each at a distance of 2m and 4m from left end A. Find the fixed end moments, the reaction at the supports and draw BMD and SFD</p>	10(M)	CO2	BL3
(OR)				
5	<p>A fixed beam AB of length 6m carries a udl of 4kN/m runs over the left half of the span and there is in addition a concentrated load of 3kN at right quarter as shown in fig. Find the fixed end moments at the ends and reaction.</p> 	10(M)	CO2	BL3
6	<p>Analyze the beam ABCD shown in figure by Slope Deflection method. Draw shear force and bending moment diagram</p> 	10(M)	CO3	BL3
(OR)				
7	<p>Analyze the portal frame ABCD shown in figure by Slope Deflection method and take EI is constant</p> 	10(M)	CO3	BL3
8	<p>Draw BMD for the continuous beam shown in Figure by using moment distribution method.</p> 	10(M)	CO4	BL3
(OR)				
9	<p>Analyze the portal frame by moment distribution method and draw bending moment diagram.</p> 	10(M)	CO4	BL3

	a) Explain procedural steps of analyzing indeterminate structure using Kani's Method.	5(M)	CO5	BL2
10	b) Analyze the continuous beam shown in Figure by Kani's method and draw BMD 	5(M)	CO5	BL3
(OR)				
11.	Analyze the continuous beam shown in Figure by Stiffness matrix method. 	10(M)	CO5	BL3
