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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations December-2025
STRUCTURAL ANALYSIS
(Civil Engineering)

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

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define the term strain energy	CO1	L1	2M
	b	Define Proof resilience	CO1	L1	2M
	c	What do you mean by indeterminate structure? Give some example.	CO2	L1	2M
	d	How do you find the degree of indeterminacy for a truss member	CO2	L1	2M
	e	What is meant by fixed end moment?	CO3	L1	2M
	f	Write down the Claypeyron's theorem of three moments.	CO3	L1	2M
	g	State the assumption made in the slope deflection method	CO4	L1	2M
	h	Write down the slope deflection equation and mention the terms.	CO4	L1	2M
	i	What does the distribution theorem state?	CO5	L1	2M
	j	What is meant by carry over moment?	CO5	L1	2M

PART-B
(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	Derive an expression for strain energy stored in a member due to axial loading and due to bending moment.	CO1	L2	10M

OR

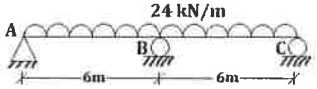
3	Determine the deflection at the free end of a cantilever beam subjected to a point load 'W' at the free end, using strain energy principle.	CO1	L2	10M

UNIT-II

4	A beam AB 4m long is fixed at A and propped at B. It carries a point load of 16 kN at a distance of 1m from B. Determine the reactions at the supports and also draw the S.F and B.M diagrams.	CO2	L2	10M

OR

5	Analyse the continuous beam shown below using Castigliano's theorem and draw the shear force and bending moment diagrams.	CO2	L3	10M

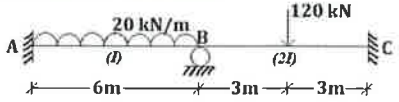


UNIT-III

6	A fixed beam AB of span 6m carries two-point loads of 100 kN and 75 kN at a distance of 2m from A and B respectively. Find the fixing moments at the ends and the reaction at the support. Also draw the shear force and bending moment diagrams.	CO3	L3	10M

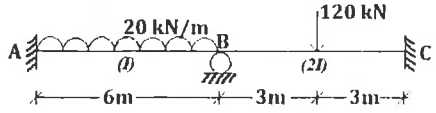
OR

7	Analyse the continuous beam shown below using Claypeyron's theorem and sketch the bending moment diagram.	CO3	L3	10M



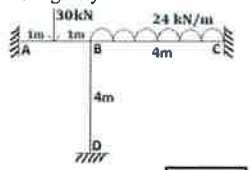
UNIT-IV

8	Analyse the continuous beam shown below using slope deflection method and sketch the shear force and bending moment diagram.	CO4	L3	



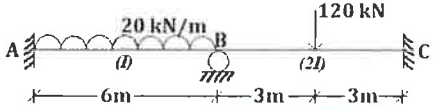
OR

9	Analyse the frame shown below using slope deflection method, by assuming uniform flexural rigidity.	CO4	L3	



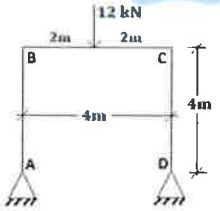
UNIT-V

10	Analyse the continuous beam shown below using moment distribution method and sketch the shear force and bending moment diagram.	CO5	L3	



OR

11	Analyse the portal frame shown in the figure using moment distribution method.	CO5	L3	



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