M19ST 1103]

I M. Tech I Semester (R19) Regular Examinations
MATRIX ANALYSIS OF STRUCURES (Elective-I)
(STRUCTURAL ENGINEERING)
MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 Marks**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
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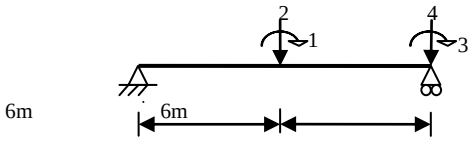
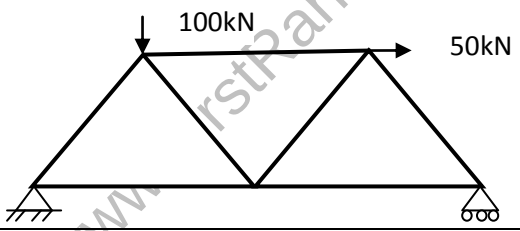
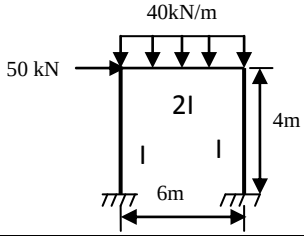
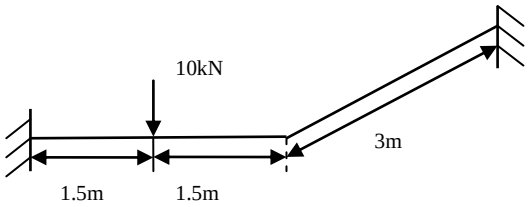
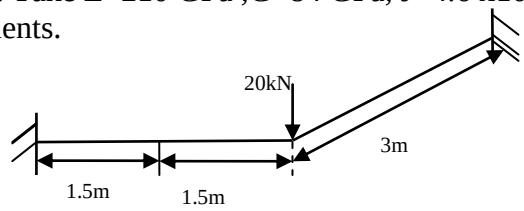
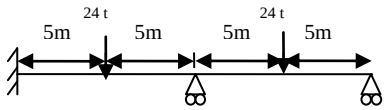
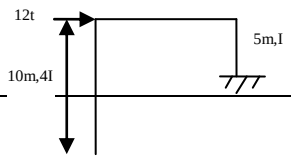
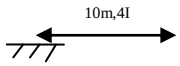
			CO	KL	M
		UNIT - I			
1.	a).	Explain degree of static indeterminacy and degree of kinematic indeterminacy of structure with examples?.	CO3	K2	7
	b).	Discuss the procedure to develop Element stiffness matrix for truss element, beam element and Torsional element	CO1	K2	8
		(OR)			
2.	a).	Explain 'Structural Idealization'	CO1	K2	5
	b).	Develop stiffness matrix for the given beam? 	CO1	K6	10
		UNIT - II			
3.	a).	Analyse the pin jointed truss given in figure below. Take E =2 x 10^5 N/mm^2, A=450 mm^2 and L= 3000 mm for all elements. Use stiffness matrix method. 	CO2	K4	10
	b).	Compare the force and displacement methods for the analysis of continus beams .	CO4	K4	5
		(OR)			
4.	a).	Analyse and draw the bending moment diagram for portal frame. Use stiffness matrix method. 	CO2	K4	10
	b).	Discuss abt the stiffness of the pin jointed and rigid jointed frame	CO4	K3	5

		UNIT - III			
5.	a).	Derive Stiffness matrix for a grid element.	CO3	K4	5
	b).	Formulate Stiffness matrix for the grid shown . EI = constant & GJ =constant for both the member. Take GJ = 0.8 EI. 	CO4	K6	10
		(OR)			
6.	a).	Analyse the grid structure ABC as shown in figure using stiffness matrix method. Take E=210 GPa ,G=84 GPa, J=4.6 x10^{-5} m^4, I=16.6 x $10^{-5}m^4$ for all elements. 	CO4	K4	10
	b).	Explain procedure for analysis of curved beam element in vertical plane deriving stiffness formulation	CO3	K2	5
		UNIT - IV			
7.	a).	Explain Banded matrix and semi band width. Give examples how band width can be reduced with nodal numbering scheme.	CO3	K2	7
	b).	Explain Method of static condensation	CO3	K2	8
		(OR)			
8.	a).	Explain the procedure for incorporating Support Displacements	CO3	K2	7
	b).	Explain the analysis of Beams on Elastic Fndations	CO3	K2	8
		UNIT - V			
9.	a).	Explain the steps involved in the analysis of continus beams with and witht settlement.	CO3	K2	5
	b).	Analyse the beam shown in the figure, if the download settlements of supports B and C in t-m units are $\frac{200}{EI}$ and $\frac{100}{EI}$ respectively. 	CO3	K4	10
		(OR)			
10.	a).	Explain the analysis of gable frame by flexibility method using system approach	CO1	K2	5
	b).	Analyse the portal frame shown in figure ,if the yielding of the support D to the right and down wards in t-m units are $\frac{20}{EI}$ and $\frac{50}{EI}$ respectively 	CO3	K4	10

CO: Crse tcome
KL: Knowledge Level
M: Marks