Question Paper Code: R18A31CE03

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech I Semester Supplementary Examinations, December-2024

STRUCTURAL ANALYSIS – II

(CIVIL ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

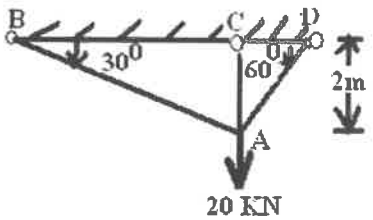
Section – A (Short Answer type questions) (25 Marks)

Answer All Questions		Marks	CO	B.T Level
1.	What is the static and kinematic indeterminacy of simply supported triangular truss subjected loads at one of the joints.	2M	CO1	L1
2.	Discuss the effect of temperature on the horizontal thrust of two hinged arch	3M	CO1	L2
3.	What is the stiffness of beam at near end 'A' when far end 'B' is hinged.	2M	CO2	L2
4.	Using moment distribution method, calculate the end moment of a propped cantilever beam of span 'L' having flexural rigidity 'EI' subjected to a point load 'P' at the centre of span.	3M	CO2	L3
5.	Give the relation between rotation contribution factor and distribution factor	2M	CO3	L2
6.	Discuss the merits and demerits of Kani's method of analysis.	3M	CO3	L2
7.	When stiffness is best opted compared to flexibility method of analysis.	2M	CO4	L2
8.	Generate the stiffness matrix for a cantilever beam of span L' having flexural rigidity 'EI'	3M	CO4	L3
9.	Generate the stiffness matrix of a truss with two degrees of freedom.	2M	CO5	L3
10.	Discuss the assumptions in cantilever method of analysis	3M	CO5	L2

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A) For the frame shown below determine the forces in AC, AB and AD .Take cross sectional area as of AB and AD are 800 $mm^2$and AC as 400 mm^2.Take E= $2x10^5$ N/mm^2.

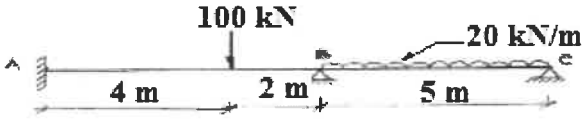
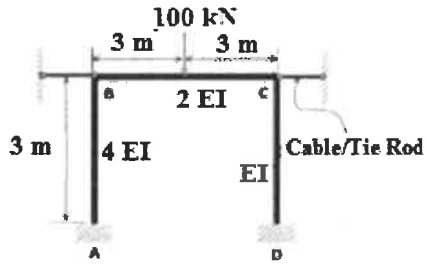
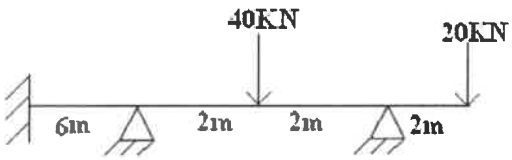
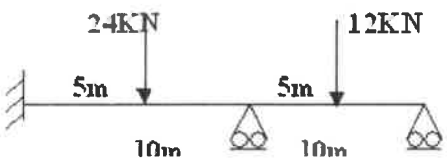


10M CO1 L3

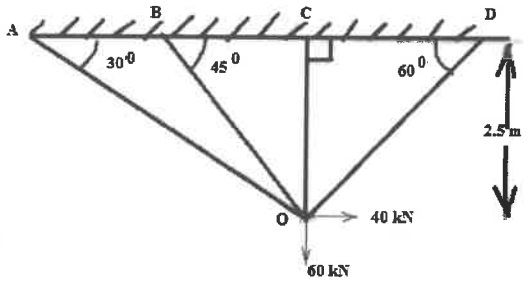
OR

B) A two hinged parabolic arch of span 36 m and central rise 8 m carries a uniformly distributed load of 32 kN/m over the left half of the span. Determine the position and value of maximum bending moment. Also find the normal thrust and radial shear at the section. Assume that the moment of inertia at a section varies as secant of the slope at the section

10M CO1 L3

12. A)	Analyze two span continuous beam for only support moments by using the Moment Distribution Method. 	10M	CO2	L3
	OR			
B)	Determine the final moment for frame ABCD shown below. 	10M	CO2	L3
13. A)	A continuous beam ABCD 20 m long is simply supported at its ends and is propped at the same level at B and C as shown in the figure. If support B sinks by and 20 mm, Analyze the beam by Kani's method and determine the end moments. Take E = 2.1×10^5 N/mm^2 and I = 85×10^5 mm^4.	10M	CO3	L3
	OR			
B)	Explain with help of an example, Kani's method for the frames with columns of equal height and subjected to horizontal loads with fixed ends and also hinged ends.	10M	CO3	L3
14. A)	Analyse the continuous beam shown in the figure using flexibility method. EI is constant. 	10M	CO4	L3
	OR			
B)	Analyze the continuous beam shown in figure using displacement method. EI is constant. 	10M	CO4	L3

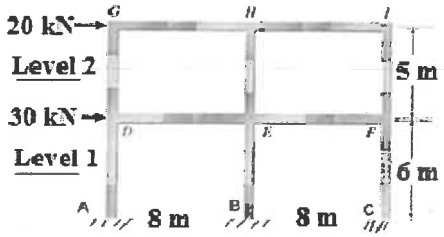
15. A) Analyse the pin-jointed truss as shown in figure by stiffness matrix method. Take area od cross-sections for all members is 1000 mm^2 and modulus of elasticity E is 200 kN/mm^2.



10M CO5 L3

OR

B) Find the reactions at the base of the columns using the Portal method of analysis.



10M CO5 L3