CONTINUOUS INTERNAL EVALUATION– 2

Dept: ME	Sem / Div: 6 A	Sub: Finite Element Methods	S Code: 18ME61
Date: 24/06/2021	Time: 9:30 am -11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

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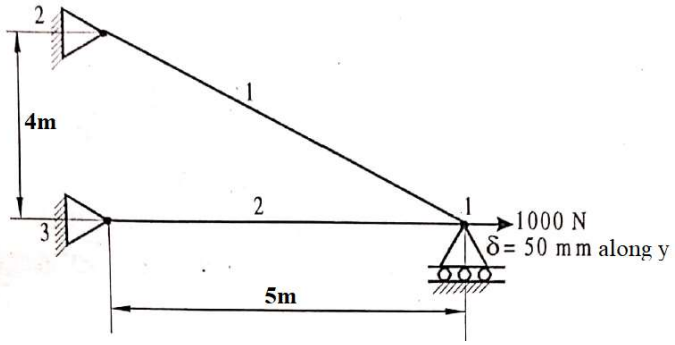
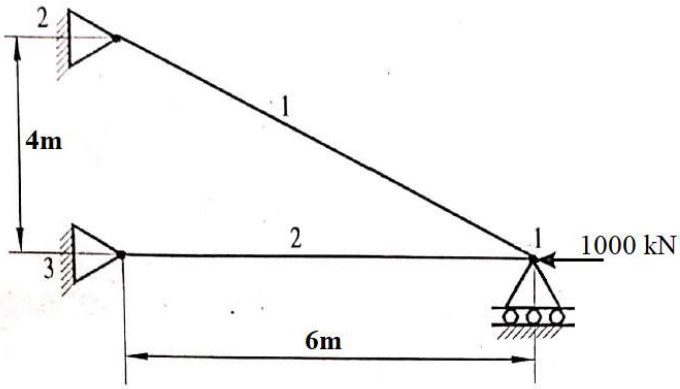
QN		Questions	Marks	RBT	COs
		PART A			
1	a	For the two bar truss shown in the figure determine i) nodal displacement ii) Stresses in each elements. Assume E = 200GPa and A = $8x10^{-4}$ m^2 for each element. 	18	L3	CO3
	b	Write a brief note on types of trusses and the assumptions made.	7	L2	CO2
		OR			
2	a	For the two bar truss shown in the figure determine i) nodal displacement ii) Reaction forces at every nodes. Take E = 210GPa and A = 700mm^2 for each element. 	15	L3	CO3
	b	Derive the stiffness for the truss element.	10	L3	CO2

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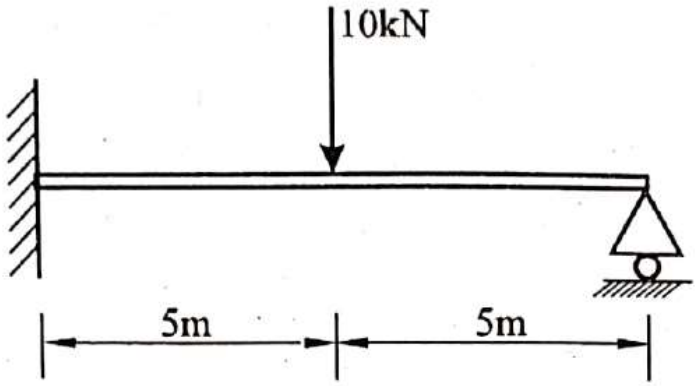
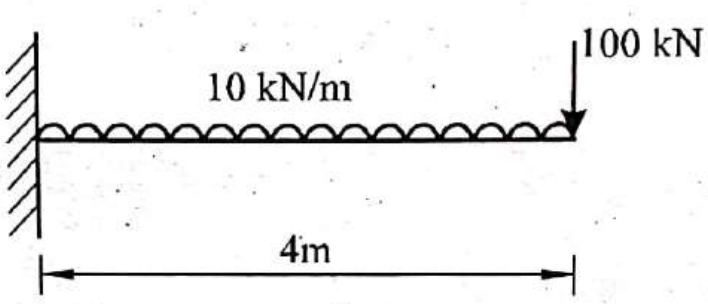
		PART B			
3	a	For beam element shown in the figure, determine the deflection under the given load. Take E = 200GPa and I = $5x10^{-6}$ m^4 	15	L3	CO3
	b	Derive the stiffness matrix for the 1D beam element using Hermite shape functions.	10	L3	CO2
		OR			
4	a	For a uniform cross sectional cantilever beam as shown in the figure, determine the deflections at the nodes. Take E = 7 x 10^9 Pa and I = $5x10^{-4}$ m^4 	13	L3	CO3
	b	Derive the Hermite shape function for 1D beam element in natural coordinate system.	12	L3	CO2