Name: **Enrolment No:**	

UPES

End Semester Examination, May 2023

Course: Finite Element Method **Semester: II**

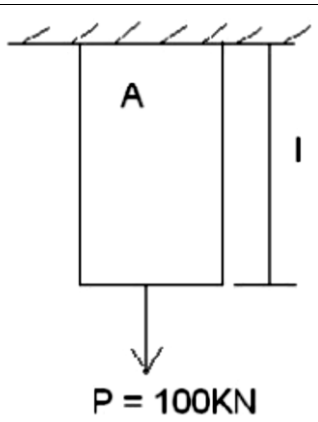
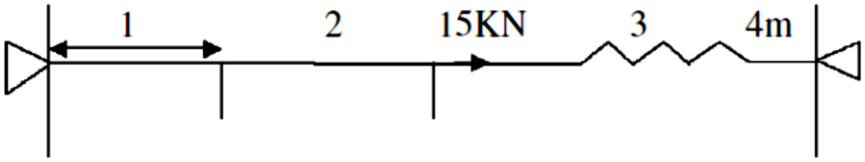
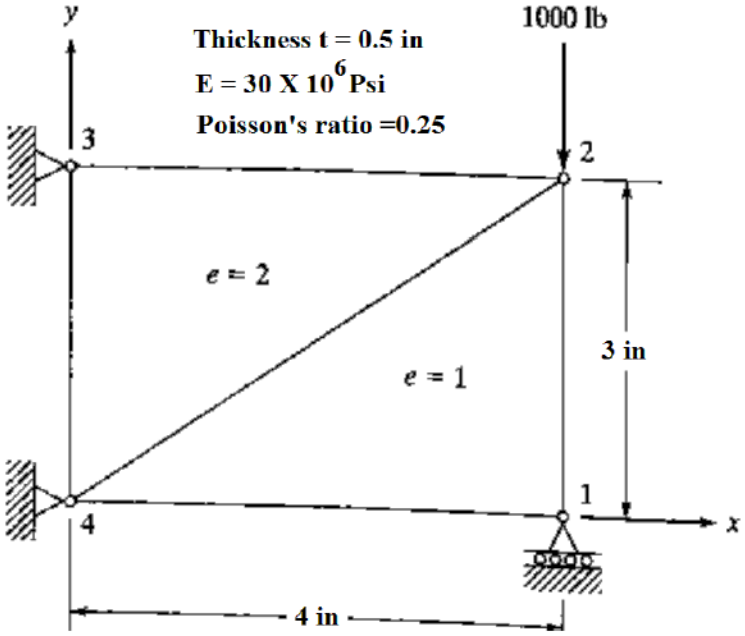
Program: M.Tech. Structural Engineering **Time : 03 hrs.**

Course Code: CIVL 7014 **Max. Marks: 100**

Instructions: Assume necessary data if required.

SECTION A

S. No.		Marks	CO
Q 1	Define shape function.	**4**	**CO1**
Q 2	State different phases of finite element method.	**4**	**CO1**
Q 3	Explain stiffness method.	**4**	**CO1**
Q 4	Name the weighted residual methods.	**4**	**CO1**
Q 5	What are the classifications of coordinates?	**4**	**CO1**
	SECTION B		
Q 6	Derive the strain displacement matrix of two dimensional four noded isoparametric elements.	**10**	**CO3**
Q 7	Explain modified galerkin Method with suitable exapmle. OR Explain Galerkin Method with Suitable example.	**10**	**CO2**
Q 8	Using Rayleigh Ritz methods calculate the deflection at the middle and end for the following cantilever beam	**10**	**CO2**

			
Q 9	For the bar assemblage as shown in fig. Determine (i)Global stiffness matrix (ii)Nodal displacement 	**10**	**CO2**
	SECTION-C		
Q 10	For the two-dimensional truss shown in Figure, determine the displacements of nodes 1 and 2 and the element stresses using plane stress conditions.  OR Determine displacements of nodes 3 and 4 and the element stresses using plane stress conditions.	**20**	**CO3**

Q 11	For a tapered plate of uniform thickness t=12mm, find the displacement at the nodes by forming into two element model. The bar has mass density ρ=7850 kg/m^3, Young's modulus, E=2 x 10^5 MN/m^2.In addition to self-weight, the plate is subjected to the point load p=10kN at its centre.	**20**	**CO4**