PRN:		Course Code :	MET4071R1

Final Year B. Tech End Semester Examination Summer 2023

Finite Element Analysis

Day and Date: Monday, 19/06/2023 Max Marks: 50

Time : 2-00 to 4-00 PM Duration: 02 hrs

Instructions: All questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Attempt any two from the following**			
a)	Compare analytical, numerical and experimental methods for solving engineering problems.	06	L1	1
b)	Write down detail procedure to solve engineering problem using FEA.	06	L1	1
c)	Classify types of elements used in FEA.	06	L2	1
Q.2	**Attempt any two from the following**			
a)	Explain how size and number of elements in FE mesh are related and their effect on solution accuracy	06	L2	2
b)	Explain node and element numbering.	06	L2	2
c)	Explain how to select type of element in FEA?	06	L1	2
Q.3	**Attempt the following**			
a)	Define shape function. Explain properties of shape functions?	06	L3	3
b)	For the stepped bar shown in figure 1 below, write the global stiffness matrix equation.	07	L5	3

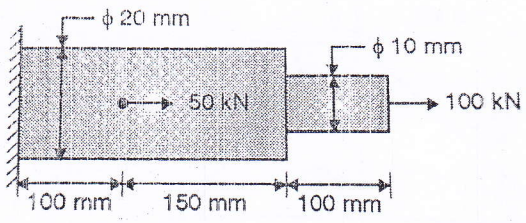


Figure 1

OR

b)	For the stepped bar shown in figure 2 below, write the global stiffness matrix equation.	07	L5	3

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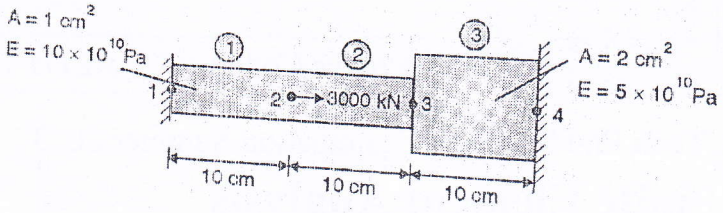


Figure 2

Q.4 **Attempt the following**

a)	Differentiate plane stress and plane strain conditions with example.	06	L3	4
b)	Determine the shape functions N_1, N_2 and N_3 at the interior point P(3.3,4.2) for the triangular element shown in the figure 3.	07	L4	4

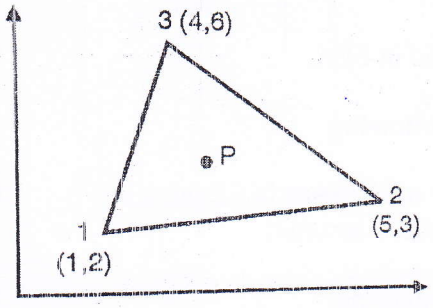


Figure 3

OR

b)	For truss shown in figure 4 below, Write down elemental stiffness matrix K for each element. Also write global stiffness matrix.	07	L4	4

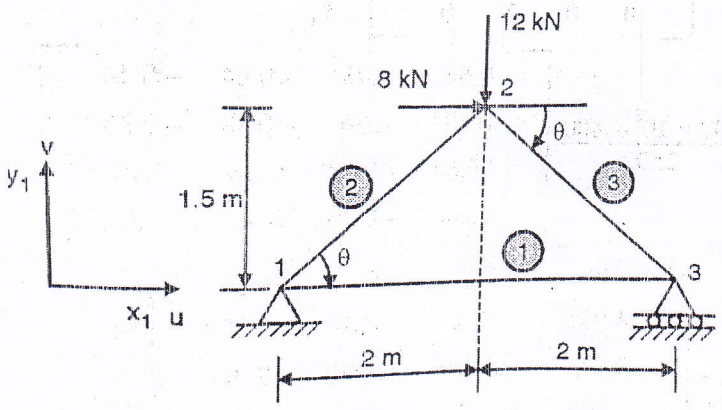


Figure 4

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