

TE INSEM April 2022 (SEM:II)

T.E.(Mechanical) (2019 Pattern)

Subject Name / Subject Code: Computer Aided Engineering / 302050

Time:1 Hours**Maximum Marks:**30**Instruction to Candidates:**

- Answer Q1 or Q2, and Q3 or Q4
- Neat diagrams must be drawn wherever necessary
- Figures to Right indicates full Marks
- Use of electronic pocket calculator is allowed

QN		Question	CO	B.L	Marks
Q.1	a)	a) The 2 Noded 1 dimensional element has node 1 and node 2 located at the distances of 200 and 360mm respectively from Y axis. The displacement of node 1 and node 2 are 0.03mm and -0.05mm respectively. At point P, located at distance 40mm from node 1 within the element, determine Natural Coordinate Shape Function Displacement	1	3	6
	b)	Explain the concept of FEM briefly and outline the procedure?	1	2	4
	c)	Discuss the advantages and disadvantages of FEM over FDM.	1	2	5
Or					
Q.2	a)	The 1D element has a length of 200mm. The Temperature at node 1 is 100 °C and at node 2 is 400°C. Evaluate the shape functions associated with node 1 & 2, If the temperature is to be estimated at point P, within the element situated at 150 mm from node 1. Also calculate temperature at point 1	1	3	6
	b)	Explain the difference between finite element method and finite difference method?	1	2	4
	c)	Explain the steps to solve the FEA problem on a software.	1	2	5
Q.3	a)	Why quality of meshing is necessary and how the convergence of element in FEA formulation is achieved	2	2	6
	b)	Explain Element selection criteria	2	2	4
	c)	Define and explain term: Aspect ratio and wrap angle	2	2	5
Or					
Q.4	a)	Write a short note on Mesh refinement vs higher order elements	2	2	6
	b)	Write a Short note on Mesh refinement	2	2	4
	c)	Explain with Neat Diagram: Effect of mesh density in critical region	2	2	5