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Ph.D Mechanical 2024-25 PYQP

Ph.D Mech Even sem 2024-25 QP

2025-05-05

FINITE ELEMENT ANALYSIS

Department of Mechanical Engineering – SEAS

SRM UNIVERSITY A.P

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SRM UNIVERSITY – AP, ANDHRA PRADESH

End Term Examination, May 2025

[Question Paper ID: 008701]

Subject : FINITE ELEMENT ANALYSIS
Title
Batch : 2021
Degree : Ph.D
Branch : ME

Subject : MCE 702
Code
Max Marks : 100
Duration : 3 hours
QP Set : ---

1 (10 × 10 Marks = 100 Marks) Answer any 10 Questions		Marks BL		CO
1. Derive consistent element mass matrix for one dimensional bar element	10	10	2	1,2
2. Derive consistent element mass matrix for truss element.	10	10	2	1,2
3. Derive stiffness matrix of a axisymmetric body with triangular elements	10	10	3	2,3
4. Formulate stiffness matrix for the shaft subjected to torque	10	10	2	1,2,3
5. Derive shape function of CST element using natural coordinate system.	10	10	3	1,2
6. Write the equations of equilibrium and strain displacement equation for 3D elastic problem.	10	10	3	1,2,3
7. Explain the following: i) variational approach ii) weighted residual methods.	10	10	2	1,2
8. Briefly discuss penalty approach to handle boundary conditions for solution of system of equations?	10	10	3	1,2
9. Derive the hermite shape functions in a beam element?	10	10	2	1,2
10. Briefly discuss the discretization process and types of elements used for discretization?	10	10	2	1,2
11. Explain natural coordinate system? Derive expression for relation between natural & cartesian coordinate systems?	10	10	3	1,2,3

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