

ED5153-Advanced Finite Element Analysis

Important 2mark question

Unit- I

1. Distinguish between plate and Shell elements with respect Degree of freedom?
2. With a suitable example write about non-conforming elements?
3. List the various weighted residual methods?
4. Write the stiffness matrix for a one dimensional two noded linear element?
5. What do you meant by constitutive law?
6. Why polynomial type interpolation functions are mostly used in TEM?
7. Compare the Ritz technique with the nodal approximation technique?
8. Differential between primary and secondary variables with suitable examples?
9. What are h and p versions of finite element method?
10. Why is variational formulation referred to as weak formulation?

Unit-II

1. Why do we resort to Iterative techniques for non-linear problem?
2. Give the strain displacement relations for large displacement formulation?
3. Give the Governing equation and the primary and secondary variable associated with the one-dimensional beam element?
4. Write the natural frequency of bar of length 'L'. young's modulus 'E' and cross section 'A' fixed at one end and carrying lumped mass 'M' at the other end?
5. Write down the expression of longitudinal vibration of bar element?
6. What are the difference between boundary value problem and initial value problem?
7. What are the properties of stiffness matrix?
8. Write the conduction, convection and thermal load matrices for 1D heat transfer through a fin?
9. Polynomials are generally used in shape function, why?
10. Differentiate between longitudinal vibration and transverse vibration?

Unit- III

1. When do you encounter rigid body modes?
2. Distinguish between consistent, lumped and HRZ lumped matrices?
3. Write the governing equation for the torsion of non-circular section and give the associated boundary conditions?
4. Why a CST element so called?

5. What is QST element?
6. Write down the stress-strain relationship matrix for plane strain condition?
7. Write down the shape function for a 4 noded quadrilateral element?
8. Distinguish between scalar and vector variable problems in 2D?
9. Classified elements, based on their dimensions?
10. What is steady state heat transfer and write its governing equation?

Unit- IV

1. Write the governing differential equation for two-dimensional heat transfer problem considering conduction and internal heat generation?
2. Write the Navier-stokes equations for compressible Newtonian fluids in Cartesian form?
3. What are the ways by which a 3D problem can be reduced to a 2D problem?
4. Write down the shape functions for a 4 noded bi-linear rectangular element?
5. What are the ways which a three-dimensional problem can be reduced to a two-dimensional approach?
6. What are the assumptions used in thin plate and thick plate elements?
7. Write the strain Displacement matrix for a 3 noded triangular element?
8. Distinguish between plate and shell elements?
9. Differentiate CST and LST elements?
10. Give four application where axisymmetric elements can be used?

Unit- V

1. Distinguish between h and p refinement?
2. What is meant by error norm?
3. What are the advantages of natural coordinate system?
4. Write the Jacobian for the one dimensional 2 noded linear element?
5. What are essential and natural boundary conditions? Give some examples?
6. Write down the stiffness matrix equation for four noded isoparametric element?
7. What are the advantages of natural coordinates?
8. Derive the Jacobian of transformation for a 1D quadratic element?
9. What is meant by 'Isoparametric element'?
10. With example, define Serendipity elements?