

R07

Code: R7410102

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013

FINITE ELEMENT METHODS IN CIVIL ENGINEERING

(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the basic steps involved in finite element method of analysis.
(b) Write the advantages, disadvantages and limitation of FEM.
2. (a) Explain the constitutive relationships for plane stress and plane strain condition.
(b) Write short notes on strain – displacement relationships.
3. Derive the shape function for a quadratic one dimensional line element in natural co-ordinate system.
4. Derive the stiffness matrix for a CST element by direct approach.
5. Discuss the finite element modeling of 2-D stress analysis with CST elements and treatment of boundary conditions
6. (a) Discuss the formulation of isoparametric CST element.
(b) Discuss the lagrangian and serendipity elements.
7. Derive the stiffness matrix for u-nodded, iso-parametric, axi-symmetric element.
8. Write short notes on:
 - (a) Solution techniques.
 - (b) Geometric invariance.
