

M.E. Second Semester (Civil Engineering (Geotechnical Engineering)) (Full Time) (C.G.S.- New)
13050 : Finite Element Methods in Geotechnical Engineering : 2 SFGE 2

P. Pages : 1

Time : Three Hours

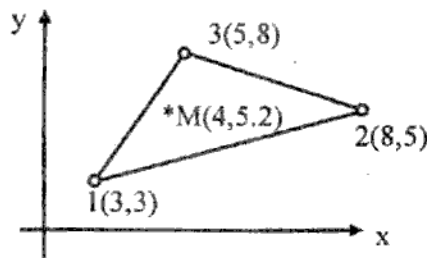


AW - 3648

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answer necessary with the help of neat sketches.
 4. Solve **any five**.

1. a) Derive the expression for stiffness matrix and nodal vector for an element using the principle of virtual work. 8
b) What is meant by 'Finite Element Analysis'? What are the uses in Geotechnical Engineering? 8
2. a) Differentiate clearly between, infinite and singular element. 8
b) Explain Rayleigh-Ritz Method in detail. 8
3. a) Define: 8
LST Element
QST Element
CST Element
Plane stress analysis
b) What are the conditions of convergence and Compatibility requirement. 8
4. a) Derive the shape functions for five noded transition triangular element & six noded transition rectangular element check the compatibility and completeness of shape function. 8
b) Explain the terms 'Axisymmetric', 'Plane Stress', and 'Plane Strain' Problems Define Constitutive law and give constitutive laws for these cases. 8
5. a) Determine the shape functions by area method at the interior Point M for the triangular element as show in Figure. 8



- b) What do you understand by Co-ordinate transformation in FEM? 8
6. a) Draw flow chart for solving simultaneous equations by any method. 8
b) Write concept of finite element analysis programming. 8
7. How will you solve the problem of a beam resting on elastic foundation employing finite element method. 16
