Q.P. Code: 16CE2012 **R16**

Reg. No. | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year II Semester Supplementary Examinations February 2018
FINITE ELEMENT METHODS
(Structural Engineering)

Time: **3** hours Max. Marks: **60**

(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

1 Explain discretization and different types of elements in FEM 12M

OR

2 Derive the formula for maximum deflection for a simply supported beam carrying a UDL load on entire span using Rayleigh-Ritz method of functional approximation. 12M

UNIT-II

3 Derive the stiffness matrix for one dimensional 3-noded quadratic element. 12M

OR

4 Define strain-displacement matrix. Generate the equation for strain displacement matrix for 1-D bar element. 12M

UNIT-III

5 Explain about
(a)Geometric invariance (b)Convergent and compatibility requirements 12M

OR

6 Derive expression for natural coordinates in a CST element. Show that they are nothing but area coordinates. 12M

UNIT-IV

7 Explain the axi symmetric analysis and axi-symmetrical formulation. 12M

OR

8 Derive an expression for the stain-displacement matrix for axi-symmetric triangular element. 12M

UNIT-V

9 Explain basic relations in thin plate theory. 12M

OR

10 Explain finite element formulation for 8-noded isoperimetric solid element 12M

***** END *****