Q.P. Code: 16CE135 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Supplementary Examinations August-2022

FINITE ELEMENT METHODS IN CIVIL ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1 Determine the deflection at the center of simply supported beam of span length 'l' subjected to Uniformly distributed load throughout its length. Use Rayleigh-Ritz method. **12M**

OR

2 Explain the plane strain condition and Axi-symmetric condition. Write the constitutive relations for plane stress condition. **12M**

UNIT-II

3 Derive the stiffness matrix for one dimensional bar element. **12M**

OR

4 **a** Explain about Elasticity equation. **6M**

b Explain the relation between stresses and strains. **6M**

UNIT-III

5 Derive the shape functions for two dimensional Tri-angular element. **12M**

OR

6 Determine the shape functions N1,N2,N3 at interior point 'p' for triangular element. The co-ordinate are P(3.5,5), (2,3),(7,4) and (4,7). **12M**

UNIT-IV

7 Explain about plane stress and plane strain analysis. **12M**

OR

8 **a** Derive Stress-Strain relationship matrix. **6M**

b Derive Stress displacement relationship matrix. **6M**

UNIT-V

9 Explain about lagrangian and serendipity elements. **12M**

OR

10 Compare general quadratic element and ISO -Parametric quadrilateral element in terms of displacement. **12M**

*** END ***