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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
 (AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Feb-2021
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 a Explain in detail step by step procedure of FEM. 6M
 b Write down Merits and Demerits of FEM. 6M

OR

- 2 a 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. 10M
 b Explain the concept of strain energy. 2M

UNIT-II

- 3 a Explain the Geometric invariance. 6M
 b Explain the Displacement models. 6M

OR

- 4 a Explain the Displacement models. 6M
 b Explain about Elasticity equation. 6M

UNIT-III

- 5 a Define shape function. write the properties of shape functions also ,write shape Function in the form of global and local co-ordinate system. 8M
 b Differentiate between CST and LST elements. 4M

OR

- 6 a Derive the shape function by using Global co-ordinate system. 6M
 b Derive the shape function by using Local co-ordinate system. 6M

UNIT-IV

- 7 a Derive stress - strain relationship in matrix formulation. 4M
 b Derive the stiffness matrix for stepped bar element. 8M

OR

- 8 a Derive Stress-Strain relationship matrix. 6M
 b Derive Stress displacement relationship matrix. 6M

UNIT-V

- 9 a Determine the Cartesian co-ordinates of the point 'p' which has local co-ordinates $\epsilon=0.6$ and $\eta=0.3$. The Global co-ordinates are (2,4) (3,6) (8,12) and(4,8). All dimensions are in mm. 10M
 b Explain about plane stress and plane strain conditions. 2M

OR

- 10 a Explain about formulation of 4-noded Iso-parametric Axi - Symmetric element. 7M
 b Explain about lagrangian elements. 5M

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