**Q.P. Code: 18CE1005** **R18**

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

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY::PUTTUR**
**(AUTONOMOUS)**
**M.Tech I year II Semester (R18) Regular Examinations June 2019**
**(For Students admitted in 2018 only)**

**Time: 3 hours** **FEM IN STRUCTURAL ENGINEERING** **Max. Marks: 60**

**(STRUCTURAL ENGINEERING)**

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

**UNIT I**

| | | | |
|---|---|---|---|
| **1** | **a.** | Explain the different steps involved in FEM. | **8M** |
| | **b.** | Explain discretization and classification of discretization. | **4M** |
| | | **OR** | |
| **2** | **a.** | Explain plane stress problem and plane strain problems. | **6M** |
| | **b.** | Explain nodes at discontinuities. | **6M** |

**UNIT II**

| | | |
|---|---|---|
| **3** | Derive Stiffness matrix for 1D – two noded linear bar element. | **12M** |
| | **OR** | |
| **4** | Briefly explain shape function and derive shape function for 1D – two noded line element. | **12M** |

**UNIT III**

| | | |
|---|---|---|
| **5** | Derive matrix equation for 2-D element (CST element). | **12M** |
| | **OR** | |
| **6** | Derive the strain-displacement matrix for CST element. | **12M** |

**UNIT IV**

| | | |
|---|---|---|
| **7** | Explain the terms isoperimetric, sub parametric and super parametric elements. | **12M** |
| | **OR** | |
| **8** | Derive the shape function for Axisymmetric (Rectangular) element. | **12M** |

**UNIT V**

| | | |
|---|---|---|
| **9** | Explain about different types of 3-D solid elements. | **12M** |
| | **OR** | |
| **10** | Explain basic relations in thin plate theory. | **12M** |

*****END*****