

- 269 -

Total No. of Pages 1

Roll No. ....

**FIRST SEMESTER  
SUPPLEMENTARY EXAMINATION**

**M.Tech. (Structure Engineering)**

*February - 2019*

**CE-502 ADVANCED THEORY OF STRUCTURES**

**Time: 3:00 Hrs.**

**Max. Marks: 100**

**Note :**

- Answer **any five** questions.
- o Assume suitable missing data, if any.

1. Find out equivalent joint load vector for a plane frame member of 4.5 m long. The symmetrical trapezoidal load having ordinates of 0 and 40 kN/m at the ends and 2.25 m from the ends respectively. (20)
2. Explain the applicability, merits and demerits of a framed tube structure system used in tall buildings. (20)
3. Write down stiffness matrix for a grid frame member with reference to member axis system. (20)
4. Determine rotation transformation matrix for a space truss member, which connects two ends of a member having coordinates (2,3,4) and (7,8,9). (20)
5. Explain the procedure for non-linear elastic analysis of a rigid jointed frame. (20)
6. Determine stiffness matrix of a curved beam element, which is subtending an angle of  $30^\circ$  at its centre. The ratio of  $GJ/EI$  may be taken as 0.8. The structure and loading planes are mutually perpendicular. (20)

**END**