

Sub Code: **CET-301**

ROLL NO.....

**SEMESTER EXAMINATION, 2022-23
YEAR**

Programme – Ist Yr. M.Tech – STRUCTURE ENGINEERING

ADVANCE STRUCTURAL ENGINEERING

Duration : 3:00 hrs

Max Marks: 100

Note:-Attempt all questions. All Question carry equal marks. In case of any ambiguity or missing data, the same may be assumed and state the assumption mad in the answer.

Q 1. Answer any four parts of the following.

- a) Define: stress and strain.
- b) Define: Poisson's ratio.
- c) Define Dead load and live load.
- d) Give difference between Pad footing and slope footing.
- e) Write Theorem of perpendicular axis.
- f) Define: Young's modulus and Shear modulus.

Q 2. Answer any four parts of the following.

- a) Difference between Short column & Long column.
- b) Define: Effective length & actual length.
- c) Define: One way slab & Two way slab.
- d) Definition of radius of gyration and slenderness ratio.
- e) Definition of radius of gyration and slenderness ratio.
- f) Bulk modulus and Factor of Safety.

Q 3. Answer any two parts of the following.

- a) A copper rod of 45mm x 45mm square section and 2m length is subjected to an axial pull of 100Kn. What will be the change in length if modulus of elasticity $E = 100\text{Kn/mm}^2$.
- b) A sample is having modulus of elasticity $1.4 \times 10^5 \text{ N/mm}^2$ and modulus of rigidity $0.56 \times 10^5 \text{ N/mm}^2$. Find Poisson's ratio.
- c) A circular brass rod of 2m length is subjected to axial pull of 15kN. What should be the diameter of the rod so that stress should not be more than 120n/mm^2 and elongation should not be more than 6mm. take $E = 120\text{GPa}$.

Q 4. Answer any two parts of the following.

- a) Find maximum bending moment for the following cases (a) Simply supported beam with central point load (b) Cantilever beam with UDL on entire span.
- b) A wooden beam 200 mm wide & 300 mm deep is simply supported over a span of 4 m. Bending stress does not exceed 8 N/mm², Find maxi. UDL on the beam
- c) Draw bending stress diagram for a beam 200 mm × 300 mm deep subjected to a bending moment of 80 KN.m.

Q 5. Answer any two parts of the following.

- a) Give assumptions of Euler's theory.
- b) Draw & Write effective length of the column for different end Conditions.
- c) A strut 2.5 meters long is 60 mm in diameter. One end of the strut is fixed while its other end is hinged. Find the crippling load. $E=2 \times 10^5 \text{ N/mm}^2$.