

Seat No.: \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. ARCH - SEMESTER– III . EXAMINATION– WINTER- 2017**

**Subject Code: 1035003****Date: 18-11-2017****Subject Name: Structure-III****Time: 10:30Am to 12:30 Pm****Total Marks: 50****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Define Axial Load and Eccentric Load also state equation of Direct and Bending Stress. **04**
- (b)** Differentiate between (i) Column and Strut (ii) Long Column and Short column. **06**
- Q.2 (a)** Explain buckling of a column and write down the “Euler Crippling Load” formula for different end conditions of the long column. **06**
- (b)** Calculate radius of gyration of a circular section of 75 mm diameter. **04**
- OR**
- (b)** Write the assumptions for Euler’s Column theory. **04**
- Q.3** A square column of 600 mm side carries a compressive Load of 500 kN at an eccentricity of 120 mm on y-y axis. Find maximum stress and minimum stress at the base of the column. Draw the Stress Diagram. **10**
- OR**
- Q.3** Determine the deflection at the free end B of a 5 m long cantilever beam AB, if end B carries a point load of 120 kN. Take beam of 300 x 575 mm and  $E = 2 \times 10^5 \text{ N/mm}^2$ . **10**
- Q.4** A steel rod 25 mm in diameter is 5 m long. Find the work done when an axial pull of 100 kN has applied suddenly to it. Calculate the maximum instantaneous stress and elongation produced. Take  $E = 2 \times 10^5$  **10**
- OR**
- Q.4** A two span continuous beam ABC is simply supported at A, B and C such that  $AB = 5\text{m}$  and  $BC = 5\text{m}$ . The span AB carries a central point load of 160 kN and span BC carries a u.d.l. of 20 kN/m. Draw S.F and B.M diagrams for the beam. **10**
- Q.5** A fixed beam of 8 m span carries U.D.L of 80 kN/m over its entire span. In addition, eccentric point load of 10 kn at 3 m from extreme left support of the beam. Draw S.F and B.M diagrams for the beam. Also, find point of Contra flexure. **10**

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