

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH. – SEMESTER– III EXAMINATION – SUMMER 2019

Subject Code:1035003

Date:03/06/2019

Subject Name:Structure-III

Time:02:30 PM TO 04:30 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)** Describe the expression of “Euler Crippling Load” for various end conditions of a column with sketches. **06**
- (b)** Explain Axial Load and Eccentric Load. **04**
- Q.2 (a)** Define Slenderness ratio and explain the failures of Long column and short column **06**
- (b)** Advantages and disadvantages of indeterminate Structures **04**
- OR**
- (b)** Define (1) Strain Energy (2) Proof resilience (3) Resilience (4) Modulus of resilience **04**
- Q.3 (a)** A steel rod 30 mm in diameter is 6 m long. Find the strain energy when an axial pull of 100 kN has applied suddenly to it. Also calculate the maximum stress and elongation produced. Take $E = 2 \times 10^5$ **10**
- OR**
- Q.3 (a)** Calculate the radius of gyration of the hollow rectangular Section which has outside dimension 300 mm width & 600 mm depth & inside dimension 200 mm width & 400 mm depth **06**
- (b)** Write the assumptions for Euler’s Column theory **04**
- Q.4 (a)** A square column of 500 mm side carries a compressive Load of 500 kN at an eccentricity of 100 mm on x-x axis. Find maximum stress and minimum stress at the base of the column. Draw the Stress Diagram **10**
- OR**
- Q.4 (a)** 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. Assume the size of the beam and $E = 2 \times 10^5$ N/mm **10**
- Q.5 (a)** A fixed beam of 8 m span carries a 15 kN/m udl all over the span. Draw Shear Force Diagram & Bending Moment Diagram for the beam. **10**
- OR**
- Q.5 (a)** A two span continuous beam ABC is simply supported at A, B and C such that AB= 4m and BC = 6m. The span AB carries a u.d.l. of 35 kN/m and span BC carries a central point load of 100 kN. Draw S.F and B.M diagrams for the beam. **10**
