

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH - SEMESTER- V EXAMINATION – WINTER 2016

Subject Code: 1055004

Date: 27/10/2016

Subject Name: Structure – V

Time: 10:30AM – 12:30PM

Total Marks: 50

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of IS –800 (2007) and steel table is permitted

- Q.1** (a) Draw and explain stress-strain curve for mild steel. **04**
(b) Write short note on: Beam to column Web angle connection **03**
(c) Explain with neat sketch the single and double lacing system **03**
Q.2 (a) Explain lap and butt joint with sketches **05**
(b) Explain various modes of failure of bolted joints with neat sketches **05**

OR

- (b) A tie plate of 80 X 8 mm is connected to the gusset plate to transmit a factored load of 100 kN. Determine the size and length of fillet weld. Assuming field welds and Fe 410 steel. **05**
Q.3 Two plates 120 X 10 mm and 120 X 12 mm are connected by lap joint to resist factored tensile load of 100 KN. Design a lap joint using M 16 bolts of grade 4.6 and grade 410 plates. **10**

OR

- Q.3** A member of steel roof truss consists of 2 ISA 75 X 75 X 8 mm placed back to back on either side of 8 mm thick gusset plate. The member carries an ultimate tensile load of 150 KN. Determine the number of 16 mm diameter 4.6 grade ordinary bolts required for the joint. Assume f_u of plate as 410 MPa. **10**
Q.4 An equal angle section 80 X 80 X 6 mm is connected to 8 mm thick gusset plate using 4 Nos. 20 mm diameter bolts to transfer tensile force. Determine tensile strength of the angle. Assume steel grade Fe 410. **10**

OR

- Q.4** Design a single angle to carry a tensile load of 250 kN assuming single row of M 20 bolts and $f_y = 250 \text{ N/mm}^2$. **10**
Q.5 Design a steel column to carry factored axial load of 1500 kN. The length of column is 4.0 m and hinged at both ends **10**

OR

- Q.5** Design a simply supported beam of span 5.5 m carrying working loads of DL=15 kN/m and LL=10 kN/m. Assume that the compression flange of the beam is laterally restrained throughout. **10**
