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 fu 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 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**

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