Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.ARCH - SEMESTER–V EXAMINATION – SUMMER 2021

Subject Code:2X55004 Date: 18/09/2021

Subject Name:Structure-IV

Time: 10:30AM to 12.30PM Total Marks:50

Instructions:

1. **Attempt any five out of seven questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Explain the advantages and disadvantages of steel structure.	**05**
	(b)	Explain the various loads and its combination used in structural steel as per Codal.	**05**
Q.2	**(a)**	Advantages and Disadvantages of bolt connections.	**05**
	(b)	Explain types of welds with sketches.	**05**
Q.3	**(a)**	Find out the Number of Bolts for connecting two plates 120 mm X 6 mm to transmit a factored load of 150 kN. Use 16 mm diameter black blots of grade 4.6 and steel plate having fu = 410 N/mm2. Consider Ultimate strength of bolt material fub = 400 N/mm2.	**10**
Q.4	**(a)**	Draw neat sketch the single and double lacing system.	**02**
	(b)	An ISHB 400 @ 77.4 kg/m is to be used as a column 3.5 m long with both ends restrained against rotation and translation. Determine the design axial load on the column section. Also assume the data: fy = 250 N/mm^2, fu = 410 N/mm^2 and E = 2 x 10^5 N/mm^2.	**08**
Q.5	**(a)**	Design a laterally supported simply supported beam of 4 m span, loaded for a concentrated load of 400 kN at mid span. The load is transferred through base plate of 200 mm length to the supports. Apply check for shear capacity and Bending strength only.	**10**
Q.6	**(a)**	Explain the classification of Beam Section accordance to their behaviour in Bending.	**05**
	(b)	Explain the Various Failure modes of Beams.	**05**
Q.7	**(a)**	Design the Base plate for an ISHB 300 @ 63.0 kg/m column to carry a factored load of 1000 kN. Take Fe 410 grade steel and M25 grade concrete.	**10**

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