

GUJARAT TECHNOLOGICAL UNIVERSITY**B.ARCH- SEMESTER-V EXAMINATION – WINTER 2022****Subject Code:2X55004****Date:11-01-2023****Subject Name:Structure-IV****Time:10:30 AM TO 12:30 PM****Total Marks:50****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.
5. Use of IS 800 (2007) & Steel Table is Permitted.

	Marks
Q.1 (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
Q.2 (a) Advantages and Disadvantages of bolt connections.	05
(b) Explain types of welds with sketches.	05
Q.3 (a) Determine the Tensile strength of an angle ISA 100 x 75 x 6 mm connected to the gusset plate by 4 mm welds at toe (140 mm long) and back (310 mm long) also calculate the efficiency of the tension member and take $f_y = 250$ MPa.	10
Q.4 (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.5 (a) Find out the Number of Bolt for connecting two plates 120 mm X 6 mm to transmit a factored load of 150 kN. Use 16 mm diameter black bolts of grade 4.6 and steel plate having $f_u = 410$ N/mm ² . Consider Ultimate strength of bolt material $f_{ub} = 400$ N/mm ² .	10
Q.6 (a) Explain the classification of Beam Section accordance to their nature in Bending.	05
(b) Explain the Various Failure modes of Beams.	05
Q.7 (a) Draw neat sketch the single and double lacing system.	02
(b) Design a Steel column to carry factored axial load of 1500 KN. The length of column is 3 m and fixed at both ends.	08
