

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BARCH - SEMESTER- V EXAMINATION – WINTER 2021

Subject Code: 2X55004

Date: 29/12/2021

Subject Name: Structure-IV

Time: 10:30 AM TO 12:30 PM

Total Marks: 50

Instructions:

1. Attempt all 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 Tables is permitted

Q.1 (a) What are the criteria for maximum and minimum pitch distance as per IS: 800 – 2007. **05**

(b) What is Limit state? Explain various serviceability limit states considered by IS : 800 – 2007. **05**

Q.2 Two Rectangular plates 85 mm and 70 mm wide and have 12 mm and 20 mm thickness are connected by lap joint to resist factored tensile load of 70 KN. Design a lap joint using M 16 bolts of grade 4.6 and grade 410 plates. **10**

OR

Q.2 A member of two angles ISA 75 x 75 x 6 mm placed back to back on either side of 10 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. Take F_u of plate is 410 MPa. **10**

Q.3 (a) Explain with neat sketch the single and double lacing system. **05**

(b) Explain the advantages of bolted connections over riveted connections. **05**

OR

(b) What are the advantages and disadvantages of welding over bolting or riveting. **05**

Q.4 Design a single angle to carry a design tensile load of 210 KN. Assume that the length of the member is 5 m. assuming a single row of M20 bolts and $f_y = 250$ MPa. **10**

OR

Q.4 A leg of a tower consists of ISA 200 x 200 x 18 mm of 3 m height. Calculate the compressive strength of the member considering the load is applied concentrically. Ends of the member are pinned. Take $f_y = 250$ MPa for steel. **10**

Q.5 Enlist methods of Columns Bases and explain any one with neat sketch. **10**

OR

Q.5 Draw neat sketches of any one Beam to Column connection and any one Beam to Beam connection. **10**
