Roll No of Student .....

End Semester Examination, November-December 2023

Branch: Architecture | Year and Sem.: B.Arch. 3rd Yr. (5th Sem.) | Subject: Design of Steel Structure

Subject Code: CE-318 | Time Duration: 3 Hours | Maximum Marks: 50 Marks

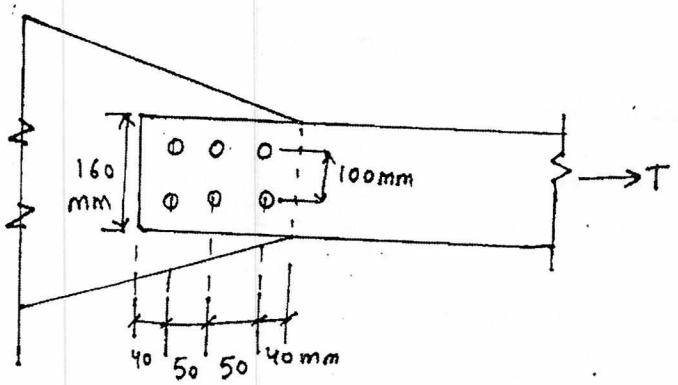
Notes: (1) All questions are compulsory. (2) Assume suitable data (if missing) and clearly mention it in the answer sheet. (3) This paper contains two pages and a total of five questions.

Q1. Two plates 200 x 10 mm of grade 410 are connected by 20 mm bolts using a double cover butt joint. Design the bolted connection to transmit a pull equal to the strength of the plate. Bolts are of grade 4.6. Take pitch =40 mm.

(10 Marks)

Q2. A flat of size 160 x 10 mm is used as a tension member in a roof truss. It can be connected to the gusset plate by bolts. Calculate the maximum tension the flat can carry if the diameter of the bolt is 16 mm. Assume yield stress of 250 N/mm^2 and ultimate stress of 410 N/mm^2.

(10 Marks)



Q3. Design a single-angle strut of a roof truss carrying a factored compressive load of 95 kN. The centre-to-centre distance of the intersection is 2.0 m. Use steel Fe-410. Assume nos. of bolt at each end connection is 2 and fixed gusset/connecting member fixidity. Take trial section ISA 75 x 75 x 8 mm.

(10 Marks)

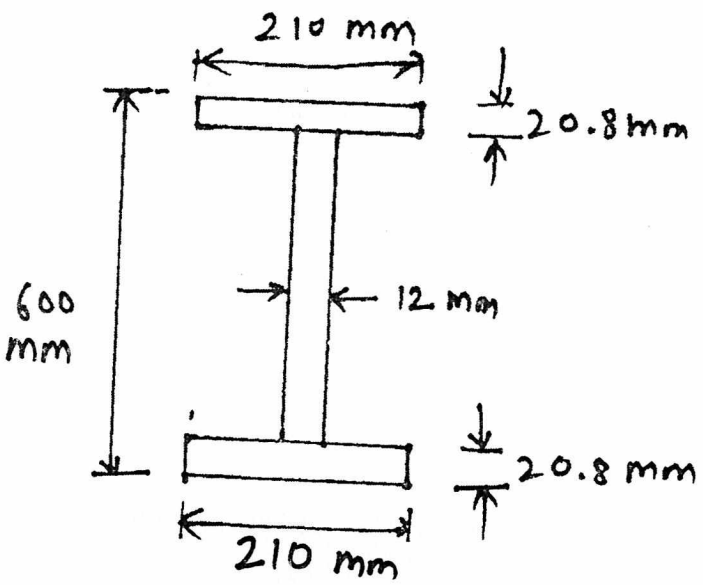
(83)

Q4. Determine the design dead load and design live load on the purlins of an industrial building and design wind pressure for the building, using the following data: (10 Marks)

- Building is located at Chennai
- Class of building: general with life of 50 years.
- Terrain: Category 2.
- Maximum dimension: 50 m.
- Width of building: 18 m.
- Height at eve level: 20 m.
- Topography: $\theta < 3$ degree.
- Permeability: Medium.
- Span of truss: 18 m.
- Pitch: 1/5.
- Sheeting: A.C. sheets.
- Spacing of purlins: 1.25m.
- Spacing of trusses: 4m.

Q6.(A) Discuss the case study of any one well known steel structure over the globe from structural engineer and architectural point of view. (5 Marks)

(B) For the following symmetric-I section, determine the plastic section modulus, elastic section modulus and shape factor about major axis. Take Fy =250 MPa. (5 Marks)



(Best of Luck)