

B. CONS. ENGG. 3rd YEAR 1ST SEM SUPPLEMENTARY EXAM.-2018

Time : Three hours

DESIGN OF STRUCTURE – I Part – I,

Full Marks : 100

Answer any two questions. Assume suitable data not provided
Use of IS 800 and SP 6 (Steel Handbook) are allowed.

- 1 a) Discuss on the advantage of steel structures as construction material. 5
- b) A T bracket section with end plate is connected to the flange of the built-up column by 6 Nos of 16 mm dia. MS clear Bolts @ 100 C/C as shown in Fig 1. The bracket carries a load of 250 kN at a distance of 90 mm from face of the column flange. Check the safety of the joint and comment if any. Assume permissible stress for shear & tension of the bolt as 80 Mpa & 120 Mpa respectively. 20

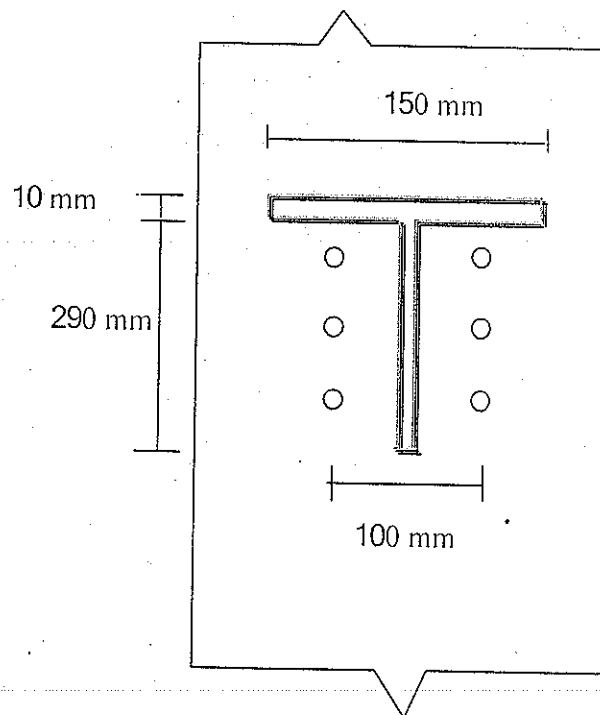


Fig.1: Bolted Bracket Connection

- 2 a) What is the Resultant Stress due to Shear and Torsion in welded connection? 5
- b) Check the safety of the double bracketed weld connection as shown in Fig.2, subjected to a total load of 180 kN at an member eccentricity of 100 mm. Use 8 mm fillet weld. 20

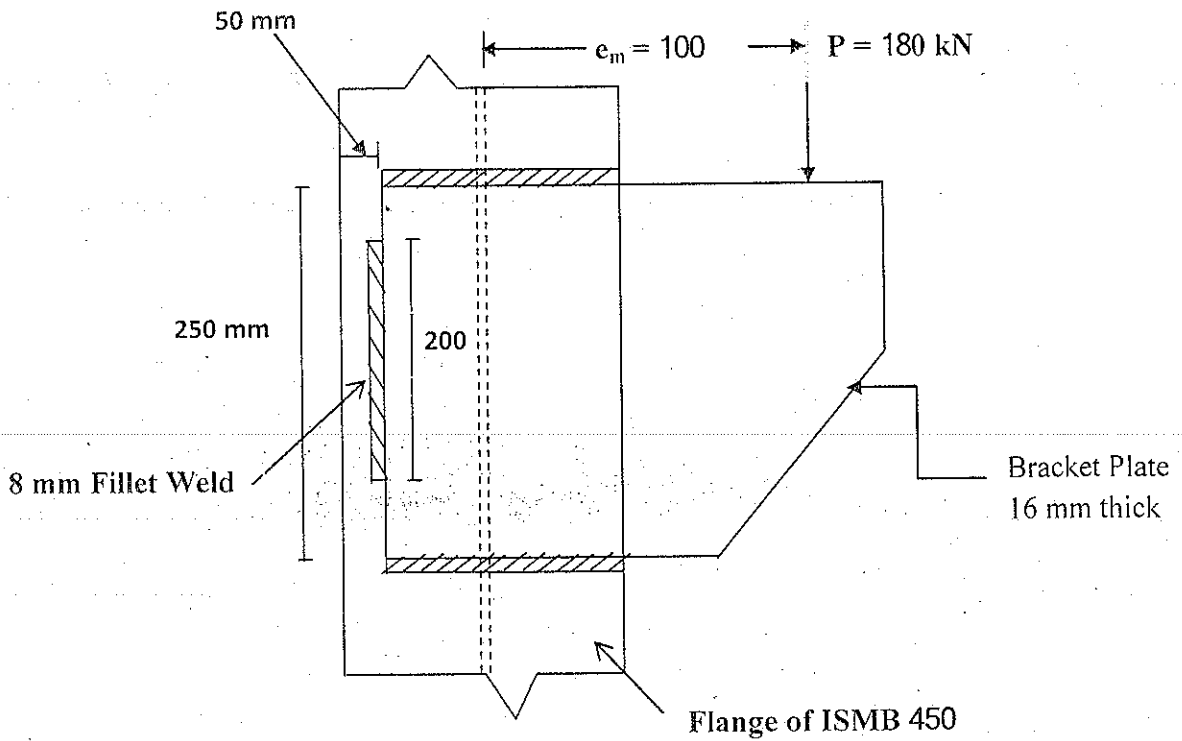


Fig. 2: Schematic Diagram of the Double Bracket

- 3 a) Define Rivet Value and discuss different modes of rivet failure. 5
- b) Design a double bracket connection as shown in Fig.3, subjected to a total load of 180 kN at an eccentricity of 100 mm. Use 20 Ø power driven field rivets. 20

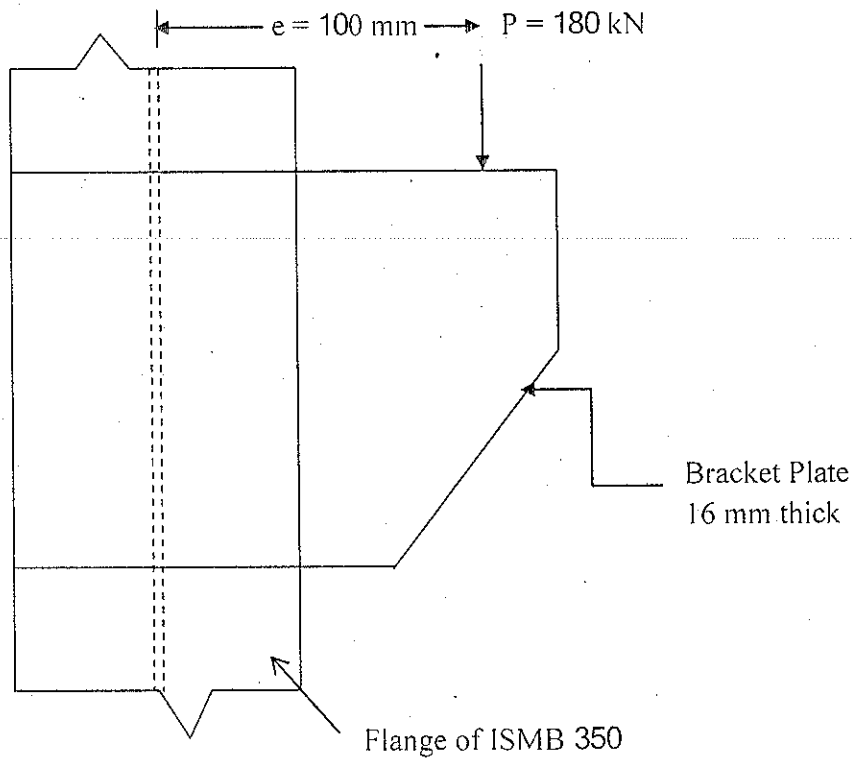


Fig. 3: Schematic Diagram of the Bracket Connection

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B. Construction Engg. 3rd Year 1st Semester Supplementary Exam 2018.

Sub: Design of Structure-I.

PART-II

Answer Question No.1 & any two from the rest[20+15X2=30]

Use Limit State method of Design.

Use Separate Answer sheet for each part.

1. Design a column of 8 meter length in a building subjected to factored load of 2500KN. One end of the column is fixed and other end is pinned. Use grade of steel Fe-250.
2. A Simply supported Steel Joist of 10 meter effective span is laterally supported throughout. It carries a UDL of 40KN/m inclusive of its Self Weight. Design an appropriate section using Steel of Grade Fe-250.
3. A column of ISMB 500 carries an axial compressive factor load of 2000KN. Design a suitable bolted base. The Grade of concrete is M25. Use 24 mm diameter of Grade 4.6 for making the connection.
4. Design a simply supported plate girder of span 20 meter and carries a UDL of 40KN/m. The compression flange is fully restrained laterally. Design the cross section of the girder only.