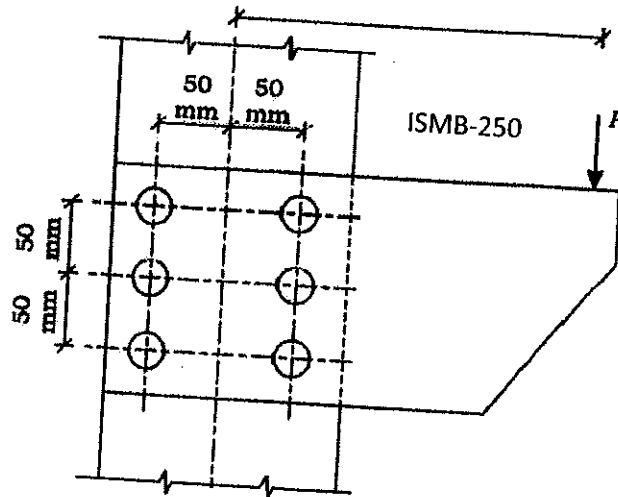


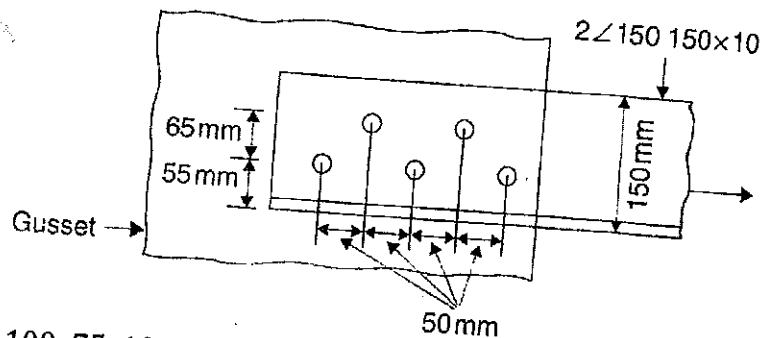
Note: All questions are compulsory. Marks are indicated against each question in square brackets. IS-800:2007 and IS808 Steel Table is allowed.

- Q1. Find the maximum for P, the bracket of thickness 10 mm can transmit. Bolts used are M20 ordinary bolt of grade 8.8. [6 Marks]



- Q2. A tie member consists of two ISMC 200. The channels are connected on either side of a 12 mm thick gusset plate. Design the welded joint to transfer a factored load of 500 kN. However the overlap is to be limited to 350 mm. [6 Marks]

- Q3. Determine the number of M20 bolts of the product Grade C and the property class 5.6 needed for the effective tensile capacity of the pair of angles placed on both sides of the gusset as shown in figure below, $f_y = 250$ MPa and $f_u = 410$ MPa. [6 Marks]



- Q4. A single ISA 100x75x10 is used in a tension member with the longer leg connected to a 10 mm thick gusset plate. The connection is made with the help of a lug angle. Design the connection and sketch the bolt details. Use M20 bolts of grade 4.6 having bolt value of 45.27 kN. Section available for lug angle are: (a) ISA 60x60x8 - 896 mm², (b) ISA 60x60x10 - 1100 mm², (c) ISA 70x70x8 - 1200 mm². [7 Marks]

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