No. of Printed Pages : **2** **ET-508(B)**

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B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2013

ET-508(B) : STRUCTURAL DESIGN-II

Time : 3 hours *Maximum Marks : **70***

*Note : Attempt **any four** questions. All questions carry **equal** marks. Use of steel table, IS : 800 and calculator is **allowed**. Assume any missing data suitably.*

1. Find the safe load that can be transmitted by the fillet welded joint as shown in figure - 1. The size of the weld is 6 mm. **17½**

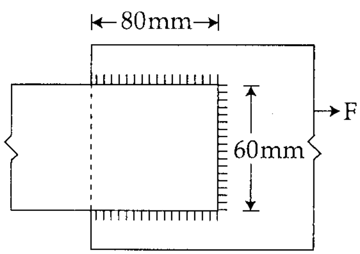

Fig. 1

2. A tension member consisting of two ISA $150 \times 115 \times 10$ mm angles are connected by their long legs to a gusset plate by means of 20 mm diameter rivets in such a way that each angle section is reduced by one rivet hole only. **17½**

Determine the tensile strength of the member when the angles are connected on the same side of a 12 mm gusset plate and tack riveted.

3. Design a built up column using lacing to carry an axial load of 1200 kN. It's length is 8 m and it is effectively held in position and restrained against rotation at one end. Assume a yield stress of 250 MPa. **17½**

Take permissible compressive stress = 120 MPa.

4. A simply supported beam of span 9m is carrying a uniformly distributed Load of 37.5 kN/m. Design a beam using standard I - sections, if the compression flange of the beam is laterally supported throughout its length. **17½**

5. A column consisting of ISHB 400 @ 822 N/m carries an axial load of 400 kN. Design the column splices when the ends of the column are milled and faced for bearing. Take $f_y = 250\ N/mm^2$. **17½**

6. Design an I - section purlin using sag bars for a trussed roof from the following data : **17½**

Span of roof = 12 m

Spacing of trusses = 5 m

Spacing of purlins along slope of roof truss = 2 m

Slope of roof truss = 1 vertical : 2 horizontal.

Wind load on roof surface normal to roof = $1000\ N/m^2$.

Vertical load from roof sheets etc. = $200\ N/m^2$.
