[4]

The section of a welded plate girder consists of flange plates 600mm×400mm and web plate 1800mm×12mm. Determine the moment capacity of the section, and the shear resistance corresponding to web buckling. Intermediate stiffeners are not provided.

4. a) Define effective length of column.
   b) Write the function of providing lacing and battens in columns.
   c) Describe the various types of column footings to support a steel column.
   d) Design a built-up column consisting of two channels placed toe-to-toe. The column carries an axial factored load of 1500 kN. The effective height of the column is 10m. Design the lacing also. Assume Fe415 grade of steel.

   OR

   Design a gusseted base for a column ISHB 350@710N/m with two plates 450mm×20mm carrying a factored load of 2250kN. The column is to be supported on concrete pedestal with M-20 grade of concrete.

5. a) Write the functions of bracing in buildings.
   b) Differentiate between a purlin and a girt.
   c) Explain in detail the stability analysis of foundation for transmission tower.
   d) Design a roof truss purlin for an industrial building for the following data:
   Span of purlin=5m, Spacing of purlin=1.275m, Roof inclination=11.3° and dead load=0.21kN/m^2.

   OR

   What are the types of transmission line towers? What is meant by tower configuration and explain in detail the various loads to be considered in design of transmission line tower?

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Total No. of Questions :5]   [Total No. of Printed Pages : 4

Roll No ....

CE-605
B.E. VI Semester
Examination, December 2016
### Structural Design and Drawing-II

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

v) Use of IS 800 code and steel table is permitted. Assume suitable value for missing data, if any.

1. a) Describe the merits and demerits of welded connections.
   b) Define fillet and butt welds.
   c) Explain the various failures of bolted joint with the help of neat diagrams.
   d) Two plates 180×10mm each are connected by double cover butt joint with 16mm diameter as shown in figure. the cover plates are 6mm thick. Determine the strength of the joint.

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[2]

OR
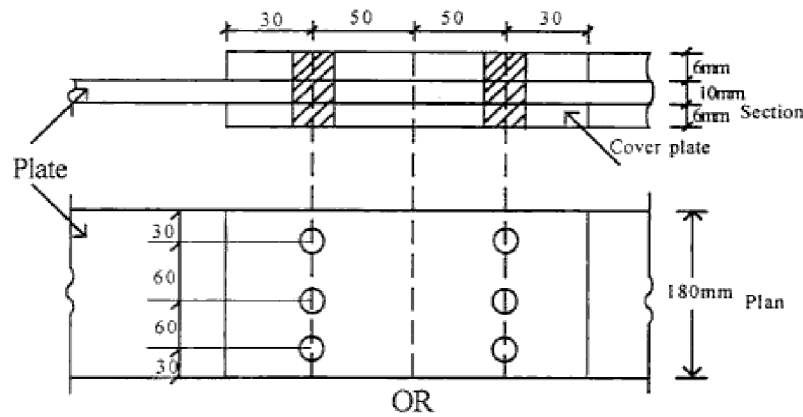
Determine the load carrying capacity of the joint as shown in figure. For 5mm weld. Assume field welding.
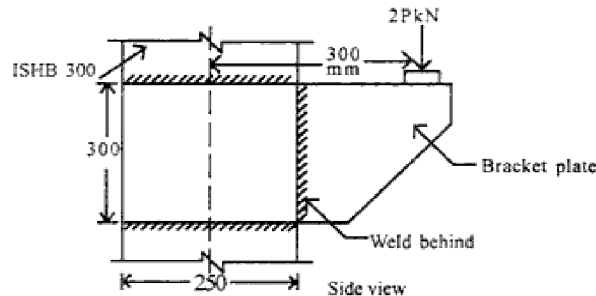
2. a) Write the importance of using built-up sections and sketch them.

   b) Differentiate between compact and semi-compact sections.

   c) What is meant by slenderness ratio and its importance in designing a section?

   d) A single unequal angle section 100×75×6mm is connected to 8mm thick gusset plate at the ends by 4mm welds. The average length of weld is 220mm. Determine the design tensile strength of the angle if the gusset plate is connected to the 100mm leg. The yield strength and

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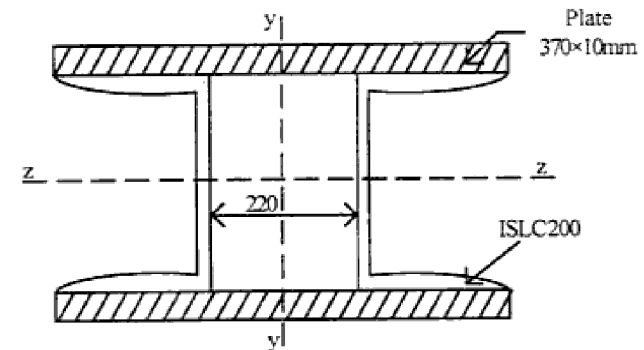
[3]

ultimate strength of the steel used are 250MPa and 400MPa.

OR

As shown in figure a built-up column section. The column has an effective length of 4.75m. Find the design compressive load that column can carry.

Take $f_y = 250 N/mm^2$ and $E = 2 \times 10^5 N/mm^2$.

3. a) Differentiate between web buckling and web crippling.

   b) Write the various types of stiffeners along with their functions.

   c) What is difference between surge load and drag load of cranes?

   d) Design a simply supported beam for 6m span carrying a reinforced concrete slab capable of providing lateral restraint to the top compression flange. The uniformly distributed load is of 30kN/m imposed load and 25kN/m dead load. Assume Fe410 grade of steel.

OR

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