Roll No ....

CE - 605

B.E. VI Semester

Examination, June 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 and steel table is permitted.

vi) Assume suitable data if required.

1. a) Explain partial load factors.

b) Discuss load combinations for plastic design.

c) A roof truss has a span of 12m and a pitch of 2.4m which is placed at 3.5m c/c. Calculate the live load on the roof truss.

d) Design a welded seat angle connection between a beam MB300 and column HB 200 for a reaction of beam 100kN. Use site welding.

OR

Design a butt joint to connect two plates 175×10mm using M20, 4.6 grade bolts. Arrange the bolts to give maximum efficiency. Also find the efficiency of joint.

2. a) Define tie. State various shape of a tie.

b) State the parameters that affect the strength of compression member.

c) What is the basic difference in behaviour between tension and compression members, while resisting the loads?

d) Determine the tensile strength of a roof truss diagonal ISA 100×75×6mm connected to the gusset plate by 4mm weld as shown in fig .
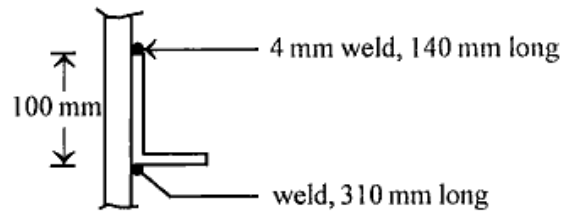
OR

Design a single angle discontinuous strut to carry a factored axial compression load of 68 kN. The length of strut is 3.0m between intersections. It is connected to 12mm thick gusset plate by m 20, 4.6 grade bolts. Assume end fixity as fixed.

3. a) Define plate girder. Draw section.

b) What are castellated sections and under what conditions are they used?

c) What is the difference between bending and buckling of a beam member? State the checks to be performed for beam design.

d) A simply supported steel joist of 4.0m effective span is laterally supported throughout. It carries a total UDL of 40kN (inclusive of self wt) design an appropriate section apply all checks.

OR

Design a load carrying stiffener for a load of 550kN for the section ISLB 400.

4. a) State the possible failure modes of an axially loaded column.

b) What is the difference in behaviour of a long column and an intermediate length column?

c) State the different steps to be followed while designing a slab base.

d) Two ISMC 350 @ 413N/m at a spacing of 220mm back-to-back are used as built up column. The effective length of column is 5.90m. Design better system for the designed load of the built up column.

OR

Design single lacing system for the above column.

5. a) What are the different types of bracings used in a braced building?

b) When are bending moments to be considered in design of the top chord of industrial trusses?

c) List the various steps involved in the design of transmission towers.

d) Describe the analysis and design of lattice towers.

OR

Sketch a braced and unbraced frame and point out the difference in their structural behaviour. State the design considerations.

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