Roll No .....

CE - 605

B.E. VI Semester

Examination, June 2013

Structural Design and Drawing-II (Steel)

Time : Three Hours

Maximum Marks : 70/100

Note: Attempt one question from each unit.
Use of IS : 800, other relevant codes and steel table is permitted.
Assume suitable value for missing data, if any.

Unit - I

1. a) What do you mean by "Partial" in the Partial load factors" and what for these factors required for calculating the design loads?

   b) The bottom tie of a roof truss is ISA60 60 x 6 and is subjected to a load of 55KN. Design the riveted joint between the tie and gusseted plate.

OR

   a) Compare riveted and welded connections.

   b) A column of ISMB 350 is provided with a bracket of ISMB 250 and a load of 60 KN applied on bracket at a distance of 300 mm from the face of column. Design a fillet welded joint.

Unit - II

2. Design the top chord member for roof truss system to carry an axial load of 200 KN. The length of member is 1.5m. Check the section for adequacy to carry an axial tension of 250 KN.

OR

Member of a roof truss is subjected to axial compression of 55KN for dead load and wind load combination. The same member is subjected to axial tension of 90KN for dead load and live load combination. Design the member.

Unit - III

3. a) Differentiate between restrained and unrestrained beams.

   b) A simply supported beam of span 8m is subjected to a concentrated load of 150 KN at mid span. Design the beam using rolled steel section. Apply all checks.

OR

A simply supported gantry girder has to carry an electric overload travelling crane for which following data have been supplied.

Crane capacity	= 320 KN
Weight of crane bridge	= 360 KN
Weight of trolley	= 100 KN
Minimum hook distance of main load	= 1.2 m
Wheel base	= 3.2 m
c/c Distance between gantry girders	= 15.0 m
Span of gantry girder	= 5.0 m
Weight of rails	= 300 N/m

Height of rails	= 75 mm

Design the cross-section of gantry girder.

Unit - IV

4. Design a built-up column using battening system to carry an axial load of 2000KN. The length of column is 6.0m. column is effectively held in position at both ends and restrained against rotation at one end.

OR

A column section of ISHB 300@ 58.8kg/m is to carry an axial load of 1000 KN. Design the slab base for the column. Take allowable bearing pressure on supporting concrete as 5 $^{N}/mm^{2}$.

Unit - V

5. a) Discuss in detail various loads to be considered for designing of multistory buildings.

   b) Draw the schematic diagram showing various components of a braced industrial building.

OR

A factory shed measuring 20m x 56m x 8m is required to be constructed on a plain open terrain at Ujjain. Calculate design wind speed and wind pressure on roof for an intermediate boy. The columns are spaced at 4m c/c.

If the roof is provided with G.I. sheet, calculate the joint loads for truss assuming slope of truss as 30°.

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