**Code: 9A01601** **R09**

B.Tech III Year II Semester (R09) Supplementary Examinations May/June 2016
**DESIGN & DRAWING OF STEEL STRUCTURES**
(Civil Engineering)

Time: 3 hours Max Marks: 70

Use of IS 800:2007, IS 806-1968, IS:875 (Part III)-1987, structural steel tables are to be permitted in the examination hall

PART – A
(Answer any one question, 1 × 28 marks)
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1 Design a column with two channels placed back to back 10 m long to carry an axial load of 750 kN. The column is restrained in position but not indirection at both ends. Provide lacing system with welded connection. Draw:
(a) Section elevation of the column.
(b) Cross section of the column.

2 A welded plate girder with an effective span of 16 m supports concentrated loads of 150 kN each at 4 m intervals. Design the plate girders section, intermediate and end bearing stiffeners. Draw the following view to a suitable scale.
(a) Elevation of girder showing the stiffeners.
(b) Cross section of the girder at midspan.
(c) Plan of the girder.

PART – B
(Answer any three questions, 3 × 14 marks)

3 (a) Write about the minimum sizes of weld.
(b) The tension members of a roof truss consists of a single angle 150 x 115 x 8. The member carries a tension of 180 kN. Find the lengths of 6mm fillet welds at the extremities of the longer leg for its connection to the gusset plate. Safe shear stress in the weld is 110 N/mm$^2$.

4 Design a beam of span 6.50 m to carry a U.D.L of 15 kN/m and two concentrate load of 75 kN each at 2 m, from eight ends of the beam. The only rolled steel I-section available is ISMB 350 @ 524 N/m. Design the beam section if the compression flange is supported laterally.

5 Design a tension member of a single T – section 2.75 m long to carry an axial tension of 275 kN. Design also the connection of the member to 10mm thick gusset plate with 18mm diameter rivets.

6 Design gusset base for a column carry an axial load of 1000 kN. The column section consists of one SC 250 and two 300 x 12 mm plates on both sides. SBC of soil is 250 kN/m$^2$ and the permissible stress of concrete is 2500 kN/m$^2$.

7 (a) Explain about different types of Trusses.
(b) Explain design principles of Gantry girder.

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