Code: 9A01601

B.Tech III Year II Semester (R09) Supplementary Examinations December/January 2014/2015
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)
*****

1   Design a slab base for a column section ISHB 350 carries an axial load of 1500 kN. The permissible bearing pressure on concrete is 5 N/mm^2. SBC of soil is 200 kN/m^2. Draw:
   (a) Side view of gusseted base.
lan(b) P   view of gusseted base.

2   Design a welded plate girder of 30 m span to support a live load of 75 kN/m uniformly distributed over the span. Adopt permissible stress as per IS 800 – 1984.
     Draw the longitudinal elevation, cross section and plan of the girder.

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

3 (a) What are the advantages of welded connections?
  (b) Two plate 180 mm x 10 mm are to be connected in a lap joint, the connection being made by transverse filleted weld and necessary plug welds. Design the connection. Use 6 mm welds.

4 (a) Explain the shear and bearing stresses the beams subjected to and the maximum permissible as per IS 800.
  (b) Design of simply supported beam of 8 m span for carrying a U.D.L of 40 kN/m if the beam is laterally unsupported. Each end of the beam is restrained against torsion and ends of compression flanges are fully restrained against lateral bending.

5 (a) Write about net effective section for angles.
  (b) The tension member of a roof truss consists of a single ISA 100 x 75 x 10 mm thick, connected at the end to agusset plate with the longer leg vertical with 18 mm dia rivets. Find the safe tension the member can withstand permissible tensile stress may be taken as 150 N/mm^2.

6   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 in direction at both ends. Provide lacing system with connections.

7   The principal rafter in a tubular truss carries a load of 180 kN. A tie member meeting at 45^0 to it carries a load of 1000 kN. The panel length of the rafter is 2.4 m and that of the tie member is 2.5 m. Design the members using Y$_{st}$ 240 Gr steel tubes.

*****