R13

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017
DESIGN & DRAWING OF STEEL STRUCTURES
(Civil Engineering)

Time: 3 hours   Max Marks: 70

Use of IS 800:2007, 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 built up column consisting of two channels placed back to back. The column carries an axial factored load of 1500 kN. The effective height of the column is 6 m. Take f_y = 250 MPa. Design the lacing connections also draw the following views:
(a) Elevation of built up column.
(b) Top view of built up column

2   Design an I-section purlin for an industrial building to support a galvanized corrugated iron sheet f_y = 250 MPa. The details of the structure as follows:
Spacing of truss = 5 m
Inclination of main rafter = 30°
Spacing of purlins = 1.6 m
Weight of corrugated sheeting = 130 N/mm^2
Imposed live load = 0.6 kN/m^2
Wind load = 1.8 kN/m^2
Yield stress of steel = 250 MPa:
Draw all the connection details of purlin with main rafter.

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

3   (a) What are the advantages and disadvantages of welded connections?
    (b) Determine the tensile strength of a roof truss 100 x 75 x 10 mm. The shorter leg is connected to the gusset plate with 20 mm diameter bolts in one row. Number of bolts used is 5. Edge/end distance is 30 mm and pitch of rivets are 55 mm.

4   (a) Explain the procedure to find out compressive stress from IS:800-2007.
    (b) Determine the load carrying capacity of a strut made with 2 ISA 100 x 100 x 8 mm back to back if the length of member is 3.6 m and welded to a gusset plate of 10 mm thick.

5   Design a simply supported beam of 6 m effective span carrying a load of 45 kN/m. The depth of the beam should not exceed 500 mm. The compression flange of the beam is laterally supported. Assume stiff end bearings is 80 mm.

6   Design a suitable welded stiffened seat connection to connect ISMB-500 transferring a load of 250 kN to an ISHB-300 @ 577 N/m.

7   Design a welded plate girder of span 24 m to carry a super imposed load of 30 kN/m. Use Fe-415 (E250) grade steel.

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