PVP 12

Code: CE6T1

III B.Tech - II Semester – Regular Examinations – April 2016

DESIGN AND DRAWING OF STEEL STRUCTURES
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Use of IS:800-2007, IS: 875 Part-III and **Steel Tables** are allowed.

PART – A

Answer any **ONE** question. 1 x 28 = 28 M

1. Design a welded plate girder 22 m in span and laterally restrained throughout. It has to support uniform load of 80 kN/m throughout the span exclusive of self weight. Design and draw the cross section, intermediate transverse stiffeners, end load bearing stiffners and connections. The steel for the flange and web plates is of grade Fe 410.

2. A column ISHB 350 @ 661.2 N/m carries an axial compressive factored load of 1600 kN. Design a suitable welded gusset base. The base rests on M-15 grade of concrete. Draw the plan and side views of gusset base.

PART – B

Answer any **THREE** questions. All questions carry equal marks. 3 x 14 = 42 M

3. Design a simply supported gantry girder for the following data.
   Crane capacity: 160 kN
   Self weight of crane girder: 200 kN
   Self weight trolley, electric motor, hooks etc.: 50kN
   Min. approach of crane hook to the gantry girder: 1.6 m
   Wheel base: 2.8 m
   c/c distance between gantry rail : 12 m
   c/c distance between column : 6m
   Self weight of rail section: 300 N/m
   Check the section for maximum bending moment due to vertical forces, lateral forces and longitudinal forces.

4. Design a 'I' section purlin, for an industrial building situated in the outskirts of Allahabad, to support a galvanized corrugated iron sheet roof for the following data:
   1) Spacing of the truss c/c = 6m,
   2) Span of truss = 12m,
   3) Spacing of purlins c/c = 1.5m,
   4) Intensity of wind pressure = 2kN/m^2,
   5) Weight of galvanized sheets = 130 N/m^2, Grade of steel = Fe 410.

5. Design a suitable fillet weld to connect a tie bar 80 x 8 mm at its end to a 10 mm thick gusset plate. Joint has to carry a tensile load of 96 kN. The permissible stresses in the tie bar and fillet weld are 150 MPa and 108 MPa respectively.

6. Design a battened column 10m long to carry a factored axial load of 1200 kN. The column is restrained in position but not in direction at both ends. Assume the channels are placed toe-to-toe.

7. Design a laterally unsupported beam of length 3m and subjected to a load of 60 kN/m.