

Code: CE6T2

**III B.Tech - II Semester – Regular Examinations – May 2017**

**DESIGN AND DRAWING OF STEEL STRUCTURES  
(CIVIL ENGINEERING)**

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

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer any *ONE* question.

1 x 28 = 28 M

1. Design gusseted base for a column ISHB 350@ 710N/m with two plates 450mm X 20mm carrying a factored load of 4000 kN. The column is supported on concrete pedestal to be built with M20 grade of concrete. (Fe 415 grade of steel). Draw to scale plan of gusset base with details and side views of the gusset base.
  - a) Design connections between the base plate and foundation.
  - b) Design connection between the column, gusset plate, cover plate and base plate by using the Bolted Connections with sketch.
2. Design a simply supported beam of 7m span carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. The total udl is made up of 100 kN dead load plus 150 kN imposed load. In addition, the

beam carries a point load at mid span made up of 50 kN dead load and 50 kN imposed load (assuming a stiff bearing length of 75mm). Draw the cross section and longitudinal section elevation.

### PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 14 = 42 M

3. a) Enlist advantages & disadvantages of steel as construction material. 4 M
- b) A tie member of a roof truss consists of 2 ISA 100 X 75 X 8 mm. The angles are connected to either side of a 10mm gusset plate and the member is subjected to a working pull of 300 kN. Design the welded connection. Assume connections are made in workshop. 10 M
4. Design a double angle tension member connected on each side of a 12 mm thick gusset plate, to carry an axial factored load of 375 kN. Use 20 mm black bolts of 4.6 grade ( $f_{ub}=400$  MPa) Assume shop connection. 14 M
5. Design a welded plate girder of span 24 m to carry superimposed load of 35 kN/m. Avoid use of bearing and intermediate stiffeners. Use Fe 415 steel. 14 M

6. Design battening for column consisting of 2 ISLC 300 placed face to face over total width of 300 mm. Length of column is 4 m with both the ends hinged. Take  $f_y = 250$  MPa. 14 M
7. A column in a building is subjected to factored load axial load of 1000 kN. It is of 6m height, hinged at both ends and braced at mid-height for restraint against buckling about weaker axis. Design the section. 14 M