

[2]

Roll No

CE - 605**B.E. VI Semester**

Examination, June 2015

Structural Design and Drawing-II**Time : Three Hours****Maximum Marks : 70**

Note : Answer five questions. Attempt one question from each unit. Assuming missing data, if any suitably. Use all the designs for serviceability should strictly be as per the latest version of IS 800.

Unit - I

1. a) Define the following term used in the design of steel structures: 4
 - i) Elastic limit
 - ii) Yield stress
 - iii) Ultimate stress and
 - iv) Permissible stress in tension and compression.
- b) Differentiate between the following types of steel
 - (i) Cast iron (ii) Mild steel (iii) High tension steel. 5
- c) Explain various types of load to be considered in design of steel structures. 5

OR

2. A tension member of a truss consists of a single angle ISA 125×75×10mm carrying a load of 200 kN. If 20 mm diameter rivets be used design the connection to the gusset plate using a lug angle. 14

Unit - II

3. A column of 10 m effective length has to support on axial factored load of 1750 kN. Design the column which shall consist of two channels placed back to back at suitable spacing. Design also single angle lacing system. 14

OR

4. Design a double angle tension member connected on each side of a 10 mm thick gusset plate to carry an axial factored load of 500 kN. Design also connections. Assume shop connection. 14

Unit - III

5. A simply supported beam of 4.5 meter effective span carries a U.D.L of 50 kN/m beam is laterally supported through out. Design the beam. Take grade of steel as Fe - 410. 14

OR

6. A riveted plate girder has a simply supported span of 20 meter. It carries a U.D.L of 150kN/m inclusive of its weight. Design a suitable cross-sections. 14

Unit - IV

7. Design a column section to support a load of 900 kN. The section shall consists of four angles. The overall dimensions of the section shall be 250 mm × 250 mm. The column has an effective length of 4 m. Take $F_y = 250$ MPa. 14

OR

8. a) Explain the term.
 - i) Slab base
 - ii) Gusseted base 4
- b) A steel column ISHB @ 576.8 N/M supports a total load of 900 kN. Design a slab base for the column. The column is to be supported on a concrete pedestal whose bearing strength may be taken as 4000 kN/m². 10

Unit - V

9. Draw the schematic diagram showing various components of a braced industrial building. 14

OR

10. Design the economical bracing system for a 30 m high self supporting transmission tower used for communication purpose with welded joints. The top members should not be less than 80 cm in length and no members should exceed the permissible limit of slenderness ratio of 180 except for members with nominal stress. The pressure exerted on RCC foundation should not exceed 5 N/mm². The Intensity of wind is 1.5 kN/m². 14