

Roll No.....

## CE - 605

### B.E. VI Semester

Examination, December 2012

### Structural Design and Drawing-II (Steel)

*Time : Three Hours*

*Maximum Marks : 100*

*Minimum Pass Marks :35*

- Note : 1. Attempt five questions one from each unit.*  
*2. All questions carry equal marks.*  
*3. Assume suitable data wherever required*  
*4. Use of IS : 800 is permitted.*

#### UNIT - I

- 1) a) Find the safe load carried by an eccentrically loaded riveted joint. The load is acting at an eccentricity of 20 cm. The rivets are 10 numbers, 20 mm diameter arranged in two rows 12 cm apart. The pitch of rivets is 8 cm. The thickness of the flange of column is 6.1 mm and that of the bracket plate is 8 mm. The load lies in the plane of rivets. (12)
- b) A tie member 75 mm x 8 mm is to transmit a load of 90 kN. Design the fillet weld and calculate the necessary overlap. (8)

OR

- 2) a) A tie member of a truss consists of an angle ISA (90 x 60 x 10) mm welded to a gusset plate of 12 mm thick through the longer leg. Design the welded joint to transmit a load equal to full strength of member. (12)

[2]

- b) A water tank is made with 10 mm thick plates. The plates are joined by single riveted lap joint using 18 mm diameter rivets at a pitch of 60 mm. Find the efficiency of the joint if the rivets are power driven. (8)

### UNIT - II

- 3) A strut in a roof truss carries an axial compressive load of 180 kN. Design a suitable double angle section for the compression member. The length of strut between centre to centre of intersections is 2.3 m and yield stress of steel is 250 MPa. (20)

OR

- 4) An unequal angle ISA 125 x 75 mm is required to carry a tensile force of 160 kN. The angle section is connected to the gusset plate through the longer leg by 18 mm diameter rivets in a single row. Select the suitable thickness of angle. (20)

### UNIT - III

- 5) A simply supported steel joist with a 4 m effective span carries a uniformly distributed load of 50 kN over its span inclusive of self weight. The beam is supported laterally throughout, select a suitable section and check its safety. (20)

OR

- 6) A Gantry girder has the following details (20)

Capacity of crane = 100 kN

Weight of trolley = 40 kN

Weight of crane girder = 200 kN

Span of crane girder = 18 M

c/c distance between column = 8M

Maximum clearance between trolley and gantry girder = 1.2M

c/c distance between crane wheels = 3 M

Calculate

- (a) Maximum bending movement
- (b) Maximum shear force using the above data.

#### UNIT - IV

- 7) Design a builtup column 10m long to carry an axial load of 750 kN. The column is restrained in position but not in direction at both the ends. Design the columns when two channels are placed back to back. Also design suitable battering system with riveted connections. (20)

OR

- 8) Design a suitable base for a column section ISHB 350 @ 724 N/m subjected to an axial load of 3000 kN. The base rests on a concrete pedestal. The safe bearing pressure of concrete is 4000 kN/m<sup>2</sup> and safe bearing capacity of soil is 200 kN/m<sup>2</sup>. (20)

#### UNIT - V

- 9) Design Girts in an industrial building for the following data.  
 Height of columns = 11M  
 c/c spacing of columns = 8 M  
 Length of roof truss Rafter = 9 M  
 Side coverings = AC sheets  
 Intensity of wind pressure = 1kN/m<sup>2</sup> (20)

OR

- 10) a) What are different elements of an Industrial building. (10)  
 b) How stability of foundations of transmission tower is checked? (10)

\*\*\*\*\*