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B.Tech.
PECI5301

6th Semester Back Examination 2017-18

DESIGN OF STEEL STRUCTURE

BRANCH : CIVIL

Time : 3 Hours

Max Marks : 70

Q.CODE : C542

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

Use of IS 800-2007 & Steel table is Allowed

Assume suitable additional data wherever required

Answer all parts of a question at a place.

Q1 Answer the following questions : (2 x 10)

- What are the types of failures occur in riveted joint?
- Define the terms gauge, pitch, edge and end distance of bolt joint
- Draw a neat sketch of ISMB 400 and mention its properties.
- What is a Lug angle?
- Explain shear lag effect.
- What are the forces acting on lacing system?
- Where should the splice plate be located in a column?
- Under what circumstances gusset base is used?
- What are the elements of plate girder?
- Draw neat sketches of various types of roof trusses.

Q2 Design a lap joint to connect two plate 300 mm wide and 16 mm thick using 20mm diameter bolts of grade 4.6. The applied service load is 375kN. **(10)**

Q3 Design a double angle strut to carry an axial factored load of 250kN. The length of strut is 3m. Bolted connections are to be used to connect it to 12mm gusset plate. **(10)**

Q4 Design a bridge truss diagonal subjected to a factored tensile load of 350kN. The length of the diagonal is 3 m. The tension member is connected to a gusset plate of 16mm thick with one line on 20 mm diameter bolts of grade 8.8. **(10)**

Q5 Design a gusseted base to carry an axial factored load of 3000kN. The column is ISHB 450 @ 855 N/m with two 250 x 20 mm cover plates on either side. The effective height of the column is 6m. The column is to rest on M25 concrete pedestal. **(10)**

Q6 Design a suitable 'I' beam for a simply supported span of 4 m and carrying a dead or permanent load of 18 kN/m and an imposed load of 40 kN/m. Assume full lateral restraint and stiff support bearing of 100 mm. **(10)**

Q7 A plate girder of span 20m is laterally restrained throughout its length .It carries an UDL of 50kN/m excluding its self weight. Design the girder without intermediate stiffener. **(10)**

Q8 Write short answer on any TWO : (5 x 2)

- Built-Up Beams
- Compact Section
- Box Girders
- Purlin