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Total Number of Page : 01 **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)**

a) What are the types of failures occur in riveted joint?
b) Define the terms gauge, pitch, edge and end distance of bolt joint
c) Draw a neat sketch of ISMB 400 and mention its properties.
d) What is a Lug angle?
e) Explain shear lag effect.
f) What are the forces acting on lacing system?
g) Where should the splice plate be located in a column?
h) Under what circumstances gusset base is used?
i) What are the elements of plate girder?
j) 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)**

a) Built-Up Beams
b) Compact Section
c) Box Girders
d) Purlin

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