Set No. **1**

Code No: RR320103

III B.Tech II Semester Regular Examinations, April/May 2006
STRUCTURAL ENGINEERING DESIGN & DRAWING-II (STEEL)
(Civil Engineering)

Note: Answer any ONE from Part-A and
THREE from Part-B
Assume suitable data wherever necessary
Use of IS codes and Structural Tables permitted.

PART- A (32marks)

1. Design a compound beam to carry two point loads of 200kN each placed at third points of 12m effective span. Assume the dead load as 2 kN/m. Carry out the curtailment of flange plates and design the rivets on welds.
Draw to a suitable scale the L.S. and C.S. of beam. [24+8]

OR

2. Design the batten system for a compression member of length 8m made up of two channels (ISLC 400 x 45.7 kg/m) placed toe-to-toe to form a square (400 x 400 mm). Find the allowable load also.
Draw to a suitable scale the details. [24+8]

PART- B (3x16=48marks)

3.a) State the disadvantages of welding.
b) Find the magnitude of the load P for bracket plate which can be applied on the connection shown in figure 1. The max allowable shear stress in welds = 110 N/mm^2. [4+12]

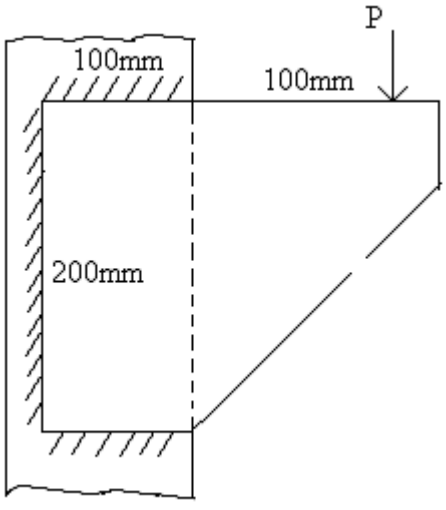


Figure 1

Contd..2

4. Design a horizontal tension member to carry a load of 600kN, if its length is 3m. The member is connected to a gusset plate 45mm thick by 20mm dia rivets. Sketch the details. [16]

5. Design the slab base for a column ISHB 300 x 58.8 kg/m carrying a load of 700 kN. It is supported on a concrete pedestal having bearing capacity of 4 MPa. [16]

6. Fix up the section of a welded or riveted plate guider of span 18m to carry a u.d.l. of 2000 kN on the whole span. Take the allowable stresses in tension and shear as 165 and 100 N/mm^2. Sketch the section. [16]

7. Write notes on any TWO of the following: [2 x8=16]
   a) Gavity girder design
   b) Design principles of eccentrically loaded columns.
   c) Tabular trusses.

&&&

Set No. **2**

Code No: RR320103

III B.Tech II Semester Regular Examinations, April/May 2006
STRUCTURAL ENGINEERING DESIGN & DRAWING-II (STEEL)
(Civil Engineering)

Note: Answer any ONE from Part-A and
THREE from Part-B
Assume suitable data wherever necessary
Use of IS codes and Structural Tables permitted.

PART- A **(32marks)**

1. Design a crane girder to be housed in a workshop for the following data:

c/c spacing of columns	=	15m
capacity of crane	=	100kN
Weight of crab	=	35kN
Weight of crane excluding crab	=	150kN
C/c of crane girders	=	25m
Wheel base	=	3.5m

Minimum clearance between c/c of crane girder and travel = 1.2m
Draw to a suitable scale the details. [24+8]

OR

2. Find the load which a column of 6m height, hinged at both ends can carry, if it is made of 4 angles 80 x 80 x 10mm placed toe-to-toe forming a square (300 x 300mm). Design the lacing also.
Draw to a suitable scale the details. [24+8]

PART- B **(3x16=48marks)**

3. A workshop of effective span 15m is provided with a pitched roof having inclination of 30^0. The supporting trusses are spaced at 3.5m c/c. Design a purl in, if their spacing is 1.5m c/c. Take the dead load as 160 N/m^2 and the wind pressure as 1.2 kN/m^2. Sketch the details. [16]

4. Calculate the size of the side fillet welds to be provided for the bracket welded to a stanchion on 3 sides as shown in figure 1. Take the permissible shear stress as 100Mpa. [16]

Contd..2

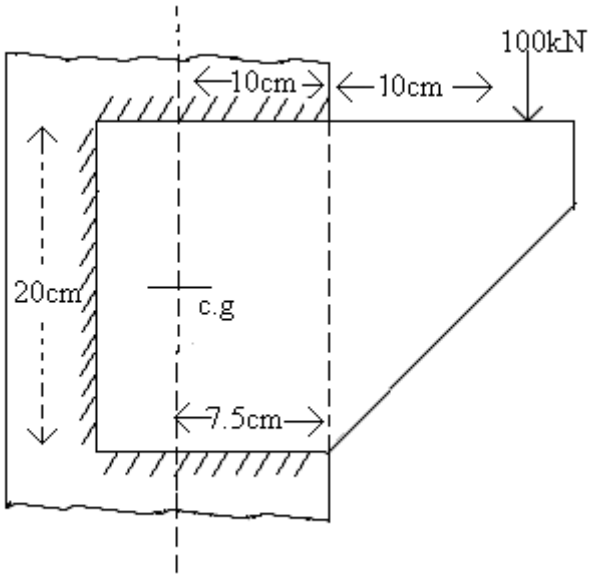


Figure 1

5. Calculate the max u.d.l. which a simply supported beam of span 12m can carry if it is made up of ISMB 500 x 86.9 kg/m with two plates in both top and bottom flanges of size 25cm x 1.2cm. Take the permissible bending stress as 165 N/mm^2.

6. Design a horizontal tension member to withstand a load of 600kN, if its length = 3m. The member is connected to a gusset plate using 6mm welds.

7. Write short notes on any TWO of the following: [2x8=16]
   a) Design of flange splice
   b) Design of laterally unsupported beams
   c) Beam-column connection design

&&&

Set No. 3

Code No: RR320103

III B.Tech II Semester Regular Examinations, April/May 2006
STRUCTURAL ENGINEERING DESIGN & DRAWING-II (STEEL)
(Civil Engineering)

Note: Answer any ONE from Part-A and THREE from Part-B
Assume suitable data wherever necessary
Use of IS codes and Structural Tables permitted.

PART- A (32marks)

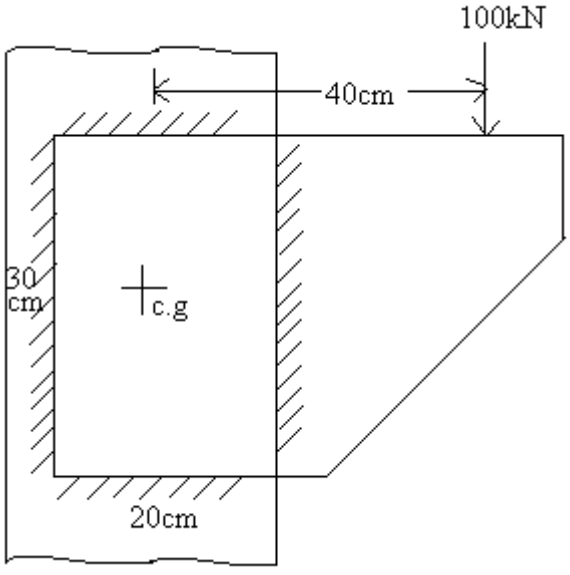
1. Design a plate girder to carry a live-load of 100kN/m over an effective span of 24m, assuming the girder to be laterally supported. Carry out the curtailment of flange plates and design the rivets or welds.
Draw to a suitable scale the L.S. and C.S. showing the details. [24+8]

OR

2. Design the lacing system for a compression member of length 8m made up of two channels (ISLC 400x45.7 kg/m) placed tow-to-toe to form a square. (400x400mm). Find the allowable load also.
Draw to a suitable scale the details. [24+8]

PART- B (3x16=48marks)

3.a) Illustrate the types of welds.
b) Calculate the size of the weld required for the bracket loaded as shown in figure 1, if the allowable shear stress in weld is 100 Mpa. [6+10]



Contd..2

4. Design a simple beam to carry a live load of 30kN/m over an effective span of 4.5m. Take the safe stresses in bending and shear as 165 and 100 Mpa. Sketch the L.S and C.S. [16]

5. Illustrate the procedure of calculating the wind forces on a roof truss. Take any example of a truss located in Hyderabad. [16]

6. Design the tension member of a roof truss to carry an axial tension of 250 kN, taking the safe stress in tension as 150 N/mm^2. The dia of rivets is 20mm. Give neat sketches. [16]

7. Write notes on any TWO of the following: [2x8=16]
   a) Beam to beam connection
   b) Splicing of columns
   c) Different types of trusses

&&&

Set No. **4**

Code No: RR320103

III B.Tech II Semester Regular Examinations, April/May 2006
STRUCTURAL ENGINEERING DESIGN & DRAWING-II (STEEL)
(Civil Engineering)

Note: Answer any ONE from Part-A and
THREE from Part-B
Assume suitable data wherever necessary
Use of IS codes and Structural Tables permitted.

PART- A **(32marks)**

1. Design a built-up column to carry an axial load of 2000kN if the column height is 6m. Use 4 angles placed toe-to-toe laced together . Design the lacing also. Draw to a suitable scale, the details. [24+8]

OR

2. Design the member carrying the max. tensile load for the roof-truss loaded as shown in figure 1. First find the forces in all the members. Draw to a suitable scale, the details. [24+8]

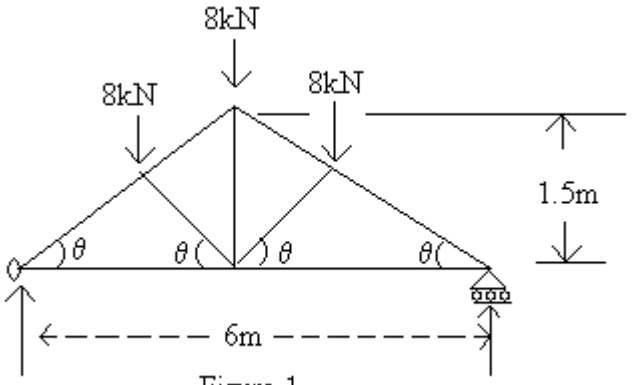


Figure 1

PART- B **(3x16=48marks)**

3.a) State the advantages of welding.

b) Find the max force per mm run on the weld for the bracket connection shown in figure 2. Suggest a suitable size of the weld. Take the permissible shear stress in the weld =100 N/mm^2. [4+12]

Contd..2

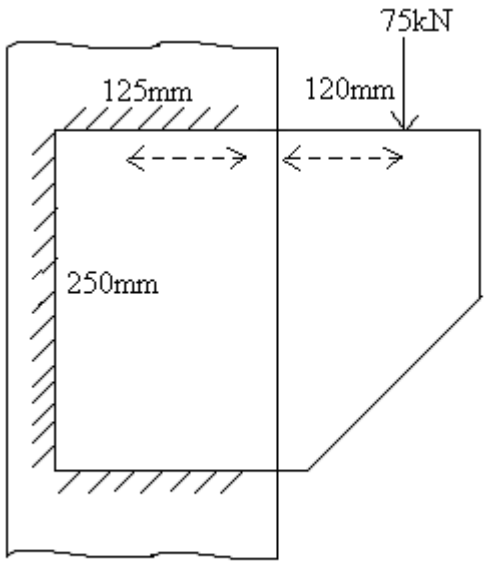


Figure 2

4. Design a simple beam to carry a live load of 24 kN/m^2 over a effective span of 8m. Take the permissible stress as 165 Mpa in bending, and 100 Mpa in shear. Sketch the L.S and C.S. [16]

5. Design the base plate and connection to the base for a column ISMB 300x58.8 kg/m to carry an axial load of 600kN and BM=10kN-m. It is supported on a concrete pedestal having beaming capacity of 4.2 Mpa. [16]

6. Illustrate the methods of curtailing the flange plates of a plate girder by taking suitable examples. Give neat sketches. [16]

7. Write notes on any TWO of the following: [2x8=16]
   a) Design of bearing stiffness
   b) Check for bearing in beams
   c) Design of welded plate guider.

&&&