

Code No: NR320107

**III/IV B.Tech I Semester Supplementary Examinations, March 2006**  
**STRUCTURAL ENGINEERING-II(STEEL) DESIGN AND DRAWING**  
**(Civil Engineering)**

**Time: 3 Hours**

**Max. Marks: 80**

**Note: Answer any ONE question from Part-A**  
**And any THREE questions from Part-B**

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**PART- A (32 marks)**

1. Design a section of plate girder to carry a uniformly distributed load of 1000KN over a span of 10m. A full lateral support is provided to the compression flange. Show the curtailment and also design the flange to web connection. Provide stiffeners if, required. Present the detailed drawing of the design. [24+8]

**(OR)**

2. Design a roof truss for a factory building for a span of 20m and a pitch of 1/5. The height of truss at the eaves level is 10m. The spacing of the trusses is 4.5m. The factory building is 50m long and situated at Delhi. Take  $f_y = 250 \text{ N/mm}^2$  for the steel sections. Draw the details of the design. [24+8]

**PART-B (16 x 3=48 marks)**

3. A double plate bracket is provided using 12mm thick plates connected to flanges of a steel column having flange thickness of 12.7mm and transmit a load of 600 KN at an eccentricity of 200mm. Design the bracket using 22mm, diameter power driven rivets. . [16]
4. A welded plate girder is to be fabricated using web plates 1600mm deep and 16mm thick and flange plates 400mm wide and 30mm thick. The girder is to be used over a simply supported span of 20m carrying a load of 20KN/m including its own weight. Design a suitable welded connection between the web and the flange taking the permissible stress in the weld as  $110\text{N/mm}^2$ . [16]
5. A tension member consists of two angle sections and carries a load of 200 KN. Design the member when both the angles are connected
  - a) on both sides of a gusset plate and
  - b) on the same side of gusset plate.[16]

**Contd..2**

6. A built – up column consists of ISHB 400 @ 0.774 KN/m with one 300mm X 12mm flange plate on each side. The column carries an axial load of 2400KN. Design a gusseted base, if the column is supported on concrete pedestal with a bearing capacity of  $4\text{N/mm}^2$ .

[16]

7. Design a simply supported gantry girder to carry an electric overhead travelling crane for the following data.

a)	Crane capacity	=	320KN
b)	Weight of crane and crab	=	300KN
c)	Weight of crane	=	200KN
d)	Minimum approach of crane hook	=	1.2m
e)	Distance between c/c of wheels	=	3.20m
f)	Distance between c/c of gantries	=	16m
g)	Span of gantry girder	=	4m
h)	Weight of rails	=	300N/m
i)	Height of rails	=	75mm

Assume  $f_y = 250 \text{ N/mm}^2$  and  
 $E = 2 \times 10^5 \text{ N/mm}^2$

[16]

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