

**III B.Tech I Semester Supplementary Examinations, November 2005**  
**STRUCTURAL ENGINEERING-II(STEEL) (1999 BATCH)**  
**(Civil Engineering)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Explain, with neat sketches, the different failures of a riveted joint  
 (b) An angle ion ISA 7S\*75\*6mm is connected to a gusset plate of thickness 10mm and has to carry a direct load of 50kN. Design the joint using hand driven field rivets.  

[8+8]
2. A beam ISLB 350, 8m span, carries a total uniformly distributed load of 250kN. It is supported on the flange of a column ISHB 200@40kg/m. Design an unstiffened welded seat connection.  

[16]
3. Design a gusseted base for a column consisting of ISHB 250@ 64.96kg/m and two cover plates 300\*25mm<sup>2</sup> and carrying an axial load of 2340kN. The permissible bearing pressure on concrete pedestal is 4N/mm<sup>2</sup>. Draw the details.  

[16]
4. Design a simply supported compound beam of span 6m to carry a udl of 45kN/m over its full span. The section available is ISMB 400. Provide flange plates, cover plates only at the top. Do all the necessary checks. Also, design the connection.  

[16]
5. (a) Write short notes on curtailment of plates.  
 (b) A plate girder consists of a web plate 100\*10mm, flange angles 4ISA 100\*100\*12, inner cover plates 300\*10mm one on each side and outer cover plates 300\*12mm one on each side. Design a web splice at a section where  $M = 1500\text{kN.m}$ ,  $v = 100\text{kN}$  and  $I_{xx} = 6.35 \times 10^9 \text{ mm}^4$  for the complete section.  

[4+12]
6. (a) Design a tension member using a channel section to carry an axial tension of 200kN.  
 (b) A column ISHB 300@ 588 N/m is to support a load of 600kN. The column section is to be spliced at a height of 2.5m. Design the spliceplate.  

[8+8]
7. (a) Explain the function of sag rods in roof trusses.  
 (b) Design an unequal angle section to act as a tie member, 1.56m long, in a roof truss if it is to carry an axial load of 120kN. Use fillet welds at joints. [4+12]
8. (a) Explain
  - i. Design forces in gantry girders
  - ii. Design principles of cranes.

- (b) When do you use roof trusses? What are the advantages of roof trusses over other flexural members. [8+8]

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