CODE NO : OR 310107 OR

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
STRUCTURAL ENGINEERING-II (STEEL)
(CIVIL ENGINEERING)

/NAVEMBER 2005

TIME: 3 HOURS
MAX MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks

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 unstiffered welded seat connection. [16]

*3. Design a gusseted base for a column consisting of ISHB 250@ 64.96kg/m and two cover plates 300*25mm2 and carrying an axial load of 2340kN. The permissible bearing pressure on concrete pedestal is 4N/mm2. 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= 1500kN.m, v = 100kN and Ixx = 6.35*109 mm4 for the complete section. [6+10]*

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. [5+11]

8. (a) Explain

i. Design forces in gantry girders

ii. Design principles of cranes. [10+6]

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