

Code No: NR310107

**III B.Tech I Semester Supplementary Examinations, November 2006
STRUCTURAL ENGINEERING-II (STEEL) (1999 BATCH)
(Civil Engineering)**

Time: 3 hours

Max Marks: 80

Note 1.: Answer any ONE question from Part-A and THREE from Part-B IS code is Permitted.

PART-A

Marks(32)

- 1.(a) Design a plate girder for an effective span of 18m. It is to carry two concentrated loads of 400 kN at 6m from both ends along with super imposed uniformly distributed load of 50kN/m. The girder is affectively supported laterally.
- (b) Sketch the longitudinal section and cross section of the girder. Show typical arrangement of stiffeners.
2. Design a steel roof truss for the following data
Span=8m, Type of truss= king post
Roof cover = AC sheeting
Spacing of roof trusses = 3m
Wind pressure = 1.5kN/m^2
Draw the elevation of the truss and the details of the joints.

PART-B

Marks (3x16=48)

3. Design a beam of 5m effective span, carrying a uniform load of 20 kN/m if the compression flange is laterally unsupported $f_y=250\text{ N/mm}^2$.
4. Design a butt-welded connection of a 12mm thick bracket plate to the flange of a column if the bracket is to transmit an end reaction of 80 kN at a distance of 12cm from the flange of the column.
5. A bridge compression member is built using two channels ISLC 400 @ 45.7 kg f/m placed toe to toe. The effective length of the member is 8m. The width over the backs of the channel is 40 cm. The channel are properly connected by lacings.
(a) Calculate the safe load for the member
(b) Design the lacing system.
6. Design a slab base for 2 column section consisting of one SC 250 with two cover plates $300\times 25\text{mm}$ carrying an axial load of 2500 kN. The safe bearing capacity of soil is 250kN/m^2 and the permissible bearing pressure on concrete is 4000 kN/m^2 . Sketch the plan details.

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7. (a) Write about the assumptions in riveted joints.
(b) Write about the advantages of welded joints.
(c) A member of a roof truss consists of two angle irons $80 \times 50 \times 6$ mm placed back-to-back on both sides of an 8mm thick gusset plate. It carries a direct load of 71kN. Determine the power driven field rivets required for the joint.
