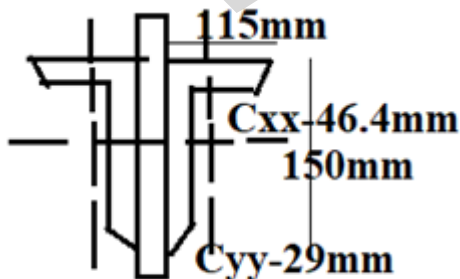


Seat No. **OCT-NOV 2025 WINTER EXAMINATION****1154 B.Tech. CBCS****Sub. Name: Design of Steel Structures****Sub. Code: 66236/80764/81001****Day and Date: Monday ,15-12-2025****Total Marks: 70****Time: 02:30 PM To 05:00 PM**

- Instructions:**
1. All questions are compulsory
  2. Assume suitable data wherever necessary and mention it boldly
  3. Draw neat labelled diagrams wherever necessary
  4. Figures to the right indicate full marks
  5. Use of Scientific calculator is allowed

**Special Inst.: IS 800-2007 and steel table is allowed in Examination**

- Q1) Attempt all Questions [7]**
- a. Compare working stress and limit state method [3]
  - b. Explain types of connections [4]
- Q2) Design a lap joint between plates of size 100mm X 16mm thick and 100mm X 10mm thick to transmit the factored load of 100kN. Use 4.6 grade 16mm diameter bolts in single row. Take  $e = 50\text{mm}$  and pitch  $p=40\text{mm}$  [14]**
- Q3) Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 150 kN. The angle is connected to 10mm gusset plate with 6 M20 bolts of grade 4.6 in single line. The steel used is of Fe 415 grade [14]**
- Q4) Find the compressive strength of strut 2ISA 150X115X10mm connected back to back by longer leg using two bolts at each end as shown in fig. 1. The centre to centre distance of intersection is 3m. [14]**

**Fig.1 Q4**

- Q5) Attempt all questions [7]**
- a. What is built up section explain briefly [3]

b. Explain classification of beams

[4]

- Q6)** Design a slab base for a column ISHB350@710.24 having factored load 1000 kN [14]  
The column. The base rests on concrete pedestal of grade M20. Assume the column is machined smooth for perfect bearing. Take  $sbc=250 \text{ kN/m}^2$
- Q7)** Design a simply supported beam of effective span 8.3 m carrying a factored [14]  
uniformly distributed load of 20 kN/m. The beam is laterally supported throughout
- Q8)** Calculate the design forces for a gantry girder to be used in an industrial building [14]  
carrying a manually operated overhead traveling crane for the following data:
- Crane capacity - 250kN
  - Self-weight of the crane girder excluding trolley - 220kN
  - Self-weight of the trolley, electric motor, hook, etc. - 60kN
  - Approximate minimum approach of the crane hook to the gantry girder - 15 m
  - Wheel base - 3 m
  - c/c distance between gantry rails - 15m
  - c/c distance between columns (span of gantry girder) - 7.5 m
  - Diameter of crane wheels - 150mm • Steel is of grade Fe 410

## End Of Question Paper

**Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -**

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (101) Bachelor of Engineering (81001) Design of Steel Structures Part 3 SEM 5
- 2] (1154) B.Tech. CBCS (80764) Design of Steel Structures Part 3 SEM 5
- 3] (101) Bachelor of Engineering (66236) Design of Steel Structures Part 3 SEM 5