



<b>ID NO.</b>	
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**PRESIDENCY UNIVERSITY, BENGALURU**  
**SCHOOL OF ENGINEERING**

Weightage: 40 %

Max Marks: 40

Max Time: 2 hrs

10 May 2018, Thursday

**ENDTERM FINAL EXAMINATION MAY 2018**

Even Semester 2017-18

Course: **CIV 213 Design of Structural Steel Elements**

VI Sem. Civil

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**Instructions:**

- (i) *Read the question properly and answer accordingly.*
  - (ii) *Question paper consists of 3 parts.*
  - (iii) *Scientific and Non-programmable calculators are permitted*
  - (iv) *IS 800: 2007, Indian standard code of practice for general construction in steel is permitted*
  - (v) *SP 6 (1): Handbook for Structural Engineers is permitted*
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**Part A**

(1 Q x 12 M = 12 Marks)

1. A roof of a hall measuring 6 x 12m consists of 125mm thick RCC slab supported on steel I-section spaced at 3.0m c/c. Take live load as 4 kN/m<sup>2</sup> and finishes as 1.5 kN/m<sup>2</sup>. Bearing of wall = 400mm. The beam is laterally restrained. Design one of the interior beam supporting the roof and apply all the necessary checks on design.

**Part B**

(1 Q x 12 M = 12 Marks)

2. A built-up column consists of ISHB 350 @ 67.4Kg/m with 400 x 20mm flange plates carries an axial load of 1800kN. Design a suitable gusseted base. Bearing strength of concrete is 0.45f<sub>ck</sub>. Assume M25 grade concrete and M20 bolts of grade 5.6. Safe bearing capacity of soil = 180 kN/m<sup>2</sup>.

### **Part C**

(2Q x 8 M = 16 Marks)

3. Distinguish between slab base and gusseted base and draw a neat sketch of sectional elevation of gusseted base indicating the salient features.
4. Distinguish between laterally restrained and unrestrained beams with help of sketches.

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**PRESIDENCY UNIVERSITY, BENGALURU**  
**SCHOOL OF ENGINEERING**

Weightage: 20%

Max Marks: 40

Max Time: 1 hr.

26 March Monday 2018

**TEST – 2**

**SET B**

Even Semester 2017-18    Course: **CIV 213 Design of Structural Steel Elements**    VI Sem. Civil.

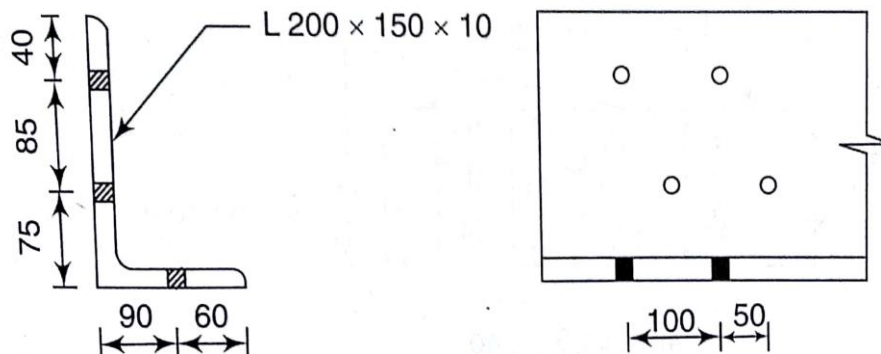
**Instruction:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted
- (iv) IS 800: 2007 & SP 6 HANDBOOK are permitted

**Part A**

(2 Q x 8 M = 16 Marks)

1. Explain the behavior of compression members.
2. Determine the net area **An**, for the 200 x 150 x 10 mm angle section with M20 bolt holes as shown in fig.1.



Angle with holes

Fig.1

**Part B**

(1Q x 12 M = 12 Marks)

3. Design a single angle strut for a roof truss carrying a compressive load of 100kN. The length of the strut between centre to centre intersections is 210 cm. Also design the bolted end connection with 4.6 grade bolt.

### Part C

(1Q x 12 M = 12 Marks)

4. Design a single angle tension member to carry a design tensile load of 400kN. Gusset plate is of 8mm thickness. Adopt 20mm diameter black bolts for connection.

**PRESIDENCY UNIVERSITY, BENGALURU**  
**SCHOOL OF ENGINEERING**

Weightage: 20 %

Max Marks: 40

Max Time: 1 hr.

21 Feb Wednesday 2018

**TEST – 1**

Even Semester 2017-18 Course: **CIV 213 Design of Structural Steel** VI Sem. Civil Engg.  
**Elements**

**Instruction:**

- (i) Read the question properly and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and Non-programmable calculators are permitted
- (iv) IS 800: 2007 & SP 6 HANDBOOK are permitted

**Part A**

(2 Q x 8 M = 16 Marks)

1. Explain various modes of failure (behavior) of bolted connections with neat sketches.
2. Explain the different types of welds used in practice.

**Part B**

(1Q x 12 M = 12 Marks)

3. For the welded bracket shown in Fig.1, determine the safe load that can be applied at a distance of 120mm from the flange of the column. The size of the weld is 6mm.

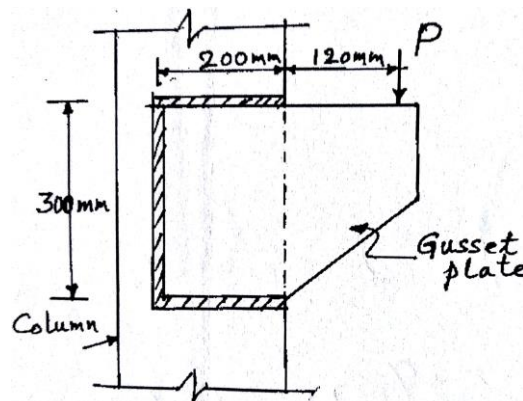


Fig.1

## Part C

(2Q x 6 M = 12 Marks)

4. A member of a truss consists of two angles ISA 75 x 75 x 6mm placed back to back. It carries an ultimate load of 150kN and is connected to a gusset plate 8mm thick placed in between the two connected legs. Determine the number of 16mm diameter, 4.6 grade ordinary bolts required for the joint. Assume ultimate stress of plate as 410Mpa.
  
5. Design a lap joint between two plates of 12mm and 20mm thick & 80mm width each so as to transmit a factored load of 70kN using M16 bolts of grade 4.6 and grade 410 plates.