

**B.TECH SEM – V (2007 COURSE) (CIVIL ENGG.) : SUMMER -  
2018**

**SUBJECT: STRUCTURAL DESIGN – I**

Day: **Wednesday**  
Date: **23/05/2018**

**S-2018-2656**

Time: **10.00 AM TO 02.00 PM**  
Max Marks: 80

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**N.B.:**

- 1) **Q. No.1 and Q.No.5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** questions from each section.
  - 2) Answers to both the sections should be written in **SEPARATE** answer books.
  - 3) Use of IS 800-2007, IS 875, steel tables, electronic **CALCULATOR** is allowed.
  - 4) Figures to the right indicate **FULL** marks.
  - 5) Assume suitable data if necessary.
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**SECTION – I**

- Q.1** a) What are different types of cross sections available in structural steel? [04]  
b) Explain block shear strength. [04]  
c) What is effect of high shear on moment capacity of beam? [04]
- Q.2** A double angle section 2ISA 150 × 150 × 12 placed back to back subjected to axial force of 800 kN. Design its bolted connection with gusset plate. [14]
- Q.3** A truss member is subjected to axial tensile force of 600 kN. Design suitable section for this assuming it is welded with gusset plate. Draw neat sketch. [14]
- Q.4** A simply supported beam of effective span 4m is laterally unsupported. An ISMB 500 is used for this beam. Calculate its shear and moment capacity. [14]

**SECTION – II**

- Q.5** a) Draw neat labeled sketch of foot over bridge. [04]  
b) What is difference between lacing and battering connection? [04]  
c) What are different types of stiffeners used in plate girder? [04]
- Q.6** Explain step by step procedure for calculation of wind load on roof truss. [14]
- Q.7** A column is made up of 2ISMC 300 placed back to back. Calculate maximum load carrying capacity of column. Effective length of column is 3.5 m. Also design suitable base by considering maximum capacity of column. [14]
- Q.8** Design a welded plate girder 20 m span and laterally restrained throughout. It is subjected to design force of 100 kN/m over whole span. Design cross section for the girder. [14]

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