B.Tech Sem – V (2007 Course) (Civil Engg.) : WINTER - 2018

SUBJECT: STRUCTURAL DESIGN – I

Day: Tuesday
Date: 27/11/2018

W-2018-2794

Time: 02.30 PM TO 06.30 PM
Max Marks: 80

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.

SECTION – I

Q.1 **a)** Explain classification of cross section. **[04]**

b) Write advantages of LSM over WSM. **[04]**

c) Explain modes of failure of tension member with neat sketches. **[04]**

Q.2 Design welded connection for ISA 150 × 150 × 12 for a member in roof truss subjected to axial force of 300 kN. It is connected with 12 mm thick gusset plate. **[14]**

Q.3 Determine design compressive strength of 2ISA 70 × 70 × 8 mm connected back to back to the 10 mm thick gusset plate. The unsupported length of member is 2.1 m. **[14]**

Q.4 An ISLB 400 used as a laterally supported beam for a span of 4m. Determine the safe UDL carried by the beam over whole span. **[14]**

SECTION – II

Q.5 **a)** How live load on roof truss is calculated? **[04]**

b) Draw neat sketch of slab base footing. **[04]**

c) What is gantry girder? **[04]**

Q.6 Calculate DL and LL at panel points for the truss with following data: **[14]**
Span of truss = 30m, spacing of truss = 5m, roof sheet = G.I. roof angle = 25^0.
Assume suitable spacing of purlin=1.5 m.

Q.7 A column is made up of 2ISMC 300 placed face to face with 100 mm clear distance between them. It is subjected to axial load of 1500 kN. The length of column is 4m with both ends fixed. Design single lacing system for this column. **[14]**

Q.8 A welded plate girder of 30 m span is subjected to design udl of 60 kN/m over whole span. Design suitable cross section for the girder. Take all necessary checks. **[14]**

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