

Day: Thursday  
Date: 22/11/2018

W-2018-2384

Time: 02.30 PM TO 06.30 PM  
Max. Marks: 60

**N.B:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.
- 4) Use of IS800, IS875, steel table and calculator is **ALLOWED**.

- Q.1 a) What are partial safety factors? Explain in detail. (05)
- b) What are different types of structural steel sections available? Explain with their nomenclature. (05)

**OR**

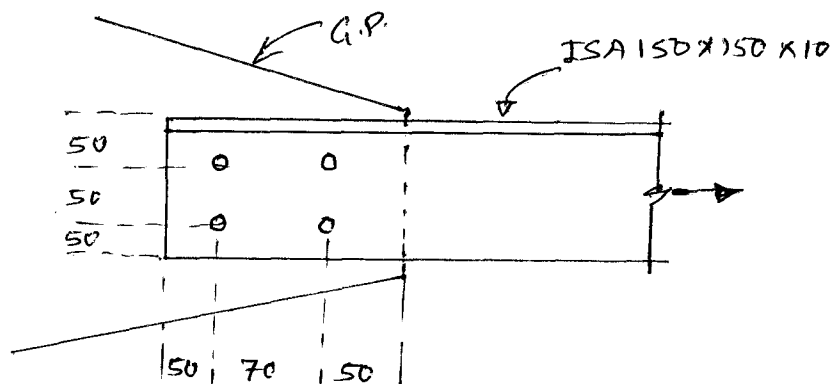
- Q.1 Calculate dead load and live load at each panel point for following truss. (10)  
Roof angle -  $30^\circ$ , spacing of purlin - 1.5m, spacing of truss - 4m. Type of root sheet - GI, span of truss - 20m.

- Q.2 a) Calculate design strength of 8mm size fillet weld per millimeter length. (05)
- b) Calculate design strength of M20 bolt of class 4.6. (05)

**OR**

- Q.2 An ISA  $200 \times 150 \times 12$  is subjected to an axial force of 500kN. Design its welded connection with gusset plate. (10)

- Q.3 Calculate block shear strength of M20 bolted joint shown in figure. (10)



**OR**

- Q.3 A truss member is subjected to design axial tension of 500kN. Design suitable single angle section for this member. (10)

P.T.O.

**Q.4** A strut is subjected to design axial compression of 800kN. The length of member is 3.5m. Design suitable section for this member. **(10)**

**OR**

**Q.4** An ISA 150×150×12 is used as strut in truss. The length of member is 3m. Calculate its design capacity in compression. **(10)**

**Q.5** An ISMB500 is used as a column. The length of column is 3.5m. It is subjected to design compressive load of 1200kN. Design suitable base for this column. Assume M25 Grade of concrete and SBC of soil 250kN/m<sup>2</sup>. **(10)**

**OR**

**Q.5** A column of effective length 3m is made up of 2ISMC 300 placed back to back with 90mm clear spacing between them. It is subjected to design compression force of 1200KN. Design battened connection for this column. **(10)**

**Q.6** a) What is laterally supported and laterally unsupported beam? **(05)**

b) What is high shear? What is its effect on design capacity of beam? **(05)**

**OR**

**Q.6** A simply supported beam of span 4m is subjected to design load of 50kN/m over whole span. If beam is laterally unsupported, design suitable cross section for this beam. **(10)**

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