

Total No. of Questions : 4]

SEAT No. :

PC-17

[Total No. of Pages : 2

[6360]-17

T.E. (Civil) (Insem)

DESIGN OF STEEL STRUCTURES

(2019 Pattern) (301003) (Semester - I)

Time : 1 Hour 15 Minutes]

[Max. Marks : 30

Instructions to the candidates:

- 1) Assume suitable data if necessary.
- 2) Figures to the right indicate full marks.
- 3) Use of non-programmable electronic calculator is allowed.
- 4) Use separate answer book for each course.
- 5) Attempt only that paper for which you have appeared.

Q1) a) A Single ISA 90×60×6 @6.79 Kg/m is connected to 10 mm thick gusset plate at the ends with 5 numbers of 18 mm bolts to transfer tension. Determine the design tensile strength of angle section if the gusset plate is connected to the longer leg. [10]

b) Explain various type of a bolted joint. [5]

OR

Q2) a) Design the tie of a roof truss subjected to factored design load 280 kN using double equal angle section. The C/C length of intersection is 2.5 m. Assume angle is connected to 8 mm thick gusset plate by 4 number of M20 bolt. [10]

b) Explain in detail gauge line, gauge distance, pitch, edge distance and end distance with sketch. [5]

Q3) a) Design a column section to carry axial compression of 750kN. The column has an effective length of 7.0 m with respect to x-x axis and 5m with respect to y-y axis. [8]

b) A column 9 m long consisting 2ISMC 300 @35.8 kg/m spaced 220mm back-to-back to carry a factored load of 1200kN. The Column is restrained in translation but not in rotation at both ends. Design a suitable lacing system. [7]

P.T.O.

OR

- Q4)** a) Design a double angle discontinuous strut to carry a factored load of 140kN. The Centre to Centre (C/C) length of strut is 2.6 m. The angle is placed back-to-back on opposite side of gusset plate. [8]
- b) Design a single angle discontinuous strut which is carrying factored load of unsupported 160kN. Length of member is 2.5 m. Assume $f_y = 250$ MPa. Minimum two bolt are to be used for end connections. Use 20 mm dia. bolts of 4.6 grades. [7]

