Total No. of Questions : 4]

SEAT No. :

P-5017

[Total No. of Pages : 2

[6187]-417

T.E. (Civil Engineering) (Insem)

DESIGN OF STEEL STRUCTURES

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

Time : 1¼ Hour] *[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) Sketch and briefly explain any three failure patterns of bolted connection. **[5]**

b) Determine the design tensile strength due to yielding and rupture of ISA 125×95×10 @ 16.5 kg/m which are connected to back to back on opposite side of 10mm thick gusset plate by 3 bolts of 20mm diameter of 4.6 grade. **[10]**

OR

Q2) a) Explain with sketches types of steel structures. **[5]**

b) Check the adequacy of an ISA 90×60×6 @6.8kg/m to carry axial tensile load of 150kN for yielding and block shear. Assume angle is connected to gusset plate of M20 black bolts of 4.6 grades. **[10]**

Q3) a) Explain modes of failure of compression members with suitable sketch. **[5]**

b) Check adequacy of 2ISA 70×70×6 @ 6.3 kg/m to factored axial compression load of 160kN. Two angles are connected on either sides of 8mm thick gusset plate by 4nos of M20 black bolts of 4.6 grades. The length of strut is 3 m. **[10]**

OR

P.T.O.

Q4) a) A 6m column is restrained in translation at both ends and restrained against rotation at one end. If an ISHB 400@ 77.4 kg/m is used calculated design compressive strength of the column. **[8]**

b) State the difference between plastic and slender section. And classify the following sections **[7]**

Where f_y = 250MPa.

i) ISLB 300@ 37.7k/m

ii) ISMC 300 @35.8 kg/m

iii) ISA 90×90×8 @8.9 kg/m

❍❍❍❍