Registration No. :

Total number of printed pages – 2

B. Tech
PECI 5301

Sixth Semester Examination – 2013
DESIGN OF STEEL STRUCTURES

BRANCH : CIVIL

QUESTION CODE : A 193

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.

The figures in the right-hand margin indicate marks.

Use of relevant IS codes and steel tables are permitted.

Assume suitable data wherever required.

1. Answer the following questions very shortly :   2 × 10

    (a) Alloy steel

    (b) Compact section

    (c) Residual stress

    (d) Serviceability

    (e) Design wind speed

    (f) Block shear

    (g) Slenderness ratio

    (h) Moment resisting frame

    (i) Bearing stiffener

    (j) Butt weld

2. Determine the tension capacity of a 125 × 75× 6 angle of Fe 410 steel assuming the connection is through the longer leg with 3 numbers M20 bolt. Will there be any difference if the shorter leg is connected ?   10

P.T.O.

3. Design a single angle strut carrying a factored compressive load of 65 KN with length between centre to centre of intersection as 3.0 m. Also design the bolted end connection. 10

4. Design a battened column with effective length of 5.0 m with two channels back to back to carry a factored load of 2000 KN. 10

5. A beam is to carry a uniformly distributed dead load of 300 KN (total) and super-imposed load of 40 KN/m. The beam is simply supported over a clear span of 8.0 m and rests over stiff bearings of 215 mm at the ends. Design the beam assuming full lateral support for the compression flange. 10

6. Compute the flexural strength of a plate girder which consists of a 8 × 1200 mm web and 30 × 450 mm flanges. Use Fe410 steel and assume the compression flange to be laterally supported. 10

7. Design a double cover butt joint to join two plates of size 200 × 10 mm of Fe410 to mobilize full tensile strength using shop welding. 10

8. Determine the maximum load inclined at 45° to the horizontal that can be transmitted if 5-16 mm diameter grade 6.8 bolts are used and the plates are 10 mm thick. All dimensions are in mm. 10