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Total number of printed pages – 2

B. Tech
PECI 5301

Sixth Semester Back Examination – 2015

DESIGN OF STEEL STRUCTURE

BRANCH : CIVIL

QUESTION CODE : M 244

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 IS 800 is allowed for reference.*



1. Answer the following questions : 2 × 10
 - (a) What do you mean by alloy steel ?
 - (b) Explain the term, *block shear*.
 - (c) Whether slenderness ratio of a member affects the tensile load carrying capacity of a member ? Explain.
 - (d) Distinguish between fillet weld and butt weld.
 - (e) What do you mean by a moment resisting frame ? Give an example.
 - (f) What is the function of a bearing stiffener ?
 - (g) Explain the term, *plastic section*.
 - (h) Draw the figure for a doubling system.
 - (i) State two assumptions of a welded joint.
 - (j) Distinguish between *design strength* and *ultimate strength*.
2. Determine the tensile load carrying capacity of a $155 \times 75 \times 8$ angle of Fe410 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 ? Explain. 10
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

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4. Design a lap joint to join two plates of size 180×12 mm of Fe410 to mobilize full tensile strength using shop fillet weld. 10
5. Design a simply supported beam of span 8.0 m to carry uniformly distributed load of 5 KN/m including self weight. Floor construction prevents the beam from lateral buckling. The beam rests over stiff bearings of 250 mm at the ends. 10
6. A welded plate girder is fabricated from two 600×30 mm flange plates and 1200×12 mm web plate of Fe410 grade steel. Find the moment capacity of the girder. 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. Design a single laced column with effective length of 6.0 m with two channels back to back to carry a factored load of 1850 KN. 10


