Reg. No. :

Question Paper Code : 50296

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth Semester

Civil Engineering

CE 6603 – DESIGN OF STEEL STRUCTURES

(Regulations 2013)

Time : Three Hours   Maximum : 100 Marks

IS : 800 – 2007, Steel Tables are Permitted.

Answer ALL questions.

PART – A   **(10×2=20 Marks)**

1. List the types of failures in a riveted joints.

2. Define efficiency of joints.

3. What is a tension splice ?

4. What is a lug angles ?

5. What is meant by slenderness ratio ?

6. State the possible failure modes in an axially loaded column.

7. Why do compression flanges require lateral support ?

8. Write short note on web splices.

9. List the types of roof trusses.

10. Write the types of load combinations for the analysis of a root truss.

PART – B   **(5×16=80 Marks)**

11. a) Design a single bolted double cover butt joint to connect plates of f_y 410 grade having thickness 16mm. Use M16 bolts of grade 4.6. Find the efficiency of the joint.

(OR)

50296

b) A double riveted lap joint in plates 10mm thick is made with 16 mm rivets at 60 mm pitch. Estimate how the joint will fail and calculate its efficiency if the tearing strength of the plates is 475 N/mm^2 and shearing and bearing strength of the rivets are 380 N/mm^2 and 750 N/mm^2 respectively.

12. a) Design a double angle tension member connected on each side of a 12 mm thick gusset plate to carry an axial factored load of 400 kN. Use 20 mm black bolts. Assume shop connection.

(OR)

b) Design a splice to connect a 300 × 20 mm plate with a 300 × 10 mm plate. The design load is 500kN. Use 20 mm bolts fabricated in shop.

13. a) Design a built-up column for a length of 3.5m to support a working load of 3500 kN. The column is effectively held at both ends and restrained in direction at one of the ends.

(OR)

b) Design a gusseted base connection for a column ISHB 400 @ 822 N/m supporting an axial load of 500 kN. The base plate is to rest on a concrete pedestal of M20 grade concrete.

14. a) Design a simply supported beam of span 5m to carry a factored Uniformly distributed load of 47 kN/m.

(OR)

b) Design a load carrying stiffener to carry a load of 600 kN for the section ISMB 450.

15. a) Design the purlin for the following specifications. Span of truss = 12m, Pitch = one fifth of span, Spacing of truss = 5 m, spacing of purlins = 1.5m, load from roofing materials = 200 N/m^2, Wind load = 1200 N/m^2. Use angle section.

(OR)

b) Explain the steps involved in the design of gantry girder.

————————