

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Sixth Semester

Civil Engineering

CE 2352/CE 62/CE 1354/10111 CE 603 — DESIGN OF STEEL STRUCTURES

(Regulation 2008/2010)

(Common to PTCE 2352/10111 CE 603 – Design of Steel Structures for
B.E. (Part-Time) Fourth Semester – Civil Engineering – Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Use of IS 800-2007, IS 883-1994 and steel tables is permitted.

Relevant data may be suitably assumed if found necessary.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by design load?
2. How do you calculate effective throat thickness?
3. What is called a lug angle?
4. What is purpose of using tension splice?
5. What is the effective length of a compression member?
6. When do you go for gusseted plates?
7. What do you mean by "Shape factor"?
8. Where bearing stiffeners are provided?
9. Draw simple sketches for
 - (a) Pratt truss
 - (b) Saw tooth truss.
10. Write any two criterion for deflection of gantry girders as per IS.

11. (a) Draw a typical stress-strain for mild steel and explain the salient points on it. Also explain the mechanical properties of mild steel.

Or

- (b) Two plates 200×8 mm of grade 410 are connected by 20 mm bolts using butt joint. Design the bolted connection to transmit a pull equal to the strength of the plate. Bolts are of grade 4.6.

12. (a) Design a T-section to act as a tension member carrying an axial tension of 300 kN.

Or

- (b) Design a tension splice to connect two plates of size 300×18 mm and 250×10 mm if the design load is 350 kN.

13. (a) Design a single angle discontinuous strut of a roof truss carrying factored compressive load of 150 kN. The centre to centre distance of intersection is 1.9 m.

Or

- (b) Design a built up column carrying an axial load of 1000 kN. Its length is 7.8 m and it is effectively held in position at both ends and restrained against rotation at one end. Assume yield stress of 250 MPa.

14. (a) A simply supported beam of 5 m span carries a factored load of 80 kN/m over the entire span. The compressive flange is fully restrained. The rolled steel section available is ISMB 300. Check whether the section is sufficient to resist the moment.

Or

- (b) Design a laterally unsupported beam simply supported over a span of 2 m. It carries UDL of 56 kN/m.

15. (a) Design an I section purlin for an industrial building situated in Mumbai to support GI sheet. Assume the relevant data.

Or

- (b) Explain the step by step procedure of design of Gantry girders. Also explain the loads you would consider in the design.