

# SRIVIDYA COLLEGE OF ENGINEERING AND TECHNOLOGY

Reg. No. :

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**Question Paper Code : 11218**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2011

Sixth Semester

Civil Engineering

CE 2352 — DESIGN OF STEEL STRUCTURES

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

IS 800 – 1984, SP 6(1) – 1964, IS 805(1-2) 1987 are permitted

Answer ALL questions

PART A – (10 × 2 = 20 marks)

1. What do you mean by staggered pitch?
2. List out the uses of bolted connection.
3. What is lug angle?
4. What do you mean by tension splices?
5. What do you mean by eccentrically loaded column?
6. Define slenderness ratio.
7. Define laterally restrained beam.
8. Write the formula for calculating the thickness of beam bearing plate.
9. What is the use of sag rod in a Roof truss?
10. Draw a neat sketch of a FINK type truss.

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PART B — ( $5 \times 16 = 80$  marks)

11. (a) An ISLC 300 @ 331 N/m is used to transmit a force of 500 kN. The channel section is connected to a gusset plate of 8 mm thick. Design a fillet weld if the overlap is limited to 350 mm.

Or

- (b) Determine the safe load and the efficiency of a double cover butt joint. The main plates are 12 mm thick connected by 18 mm diameter rivets at a pitch of 100 mm. Design the cover plates also. What is the percentage reduction in the efficiency of the joint if the plates are lap jointed?
12. (a) Design a tension member to carry a load of 300 kN. The two angles placed back to back with long leg outstanding are desirable. The length of the member is 2.9 m.

Or

- (b) Design a Tension splice for tension member sections  $160 \text{ mm} \times 10 \text{ mm}$  and  $250 \text{ mm} \times 12 \text{ mm}$ . The member is subjected to a pull of 200 kN.
13. (a) Design a built-up column with two channel sections. The column is of 6.4 m effective length and supports a load of 1000 kN.

Or

- (b) Design a suitable slab base for a column section ISHB 300, subjected to a load of 450 kN. The base plate is to rest on a concrete pedestal of M 20 grade.
14. (a) A beam is simply supported over a span of 6 m. It supports one Iron beam at mid span exerting 90 kN. Design the beam with ISWB section with flange plates. Assume the beam is not supported laterally.

Or

- (b) Design a bearing stiffener for a welded-plate girder with the following specifications :

Web =  $1000 \text{ mm} \times 6 \text{ mm}$

Flange = 2 No.s of  $320 \times 20 \text{ mm}$  plate on each side

Support reaction = 300 kN, and width of support = 300 mm.

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15. (a) A Gantry crane exerts a load of 100 kN on each of its wheels, excluding impact and other loads, the wheel distance is 3 m. The span of the gantry is 6 m. Design the girder assuming lateral support.

Or

- (b) Design the purlin for the following specifications?

Span of Truss = 12 m c/c

Pitch =  $\frac{1}{5}$  of span

Spacing of Truss = 5 m c/c

Spacing of purlin = 1.5 m c/c

Load from roofing materials etc = 200 N/m<sup>2</sup>

Wind load = 1200 N/m<sup>2</sup>

Use angle section.