

3721

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2021

DCE - SIXTH SEMESTER EXAMINATION

STEEL STRUCTURES

Time : 3 hours]

[Total Marks : 80

PART—A

4×5=20

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **four** marks.
(3) Any missing data can be suitably assumed.
(4) Reference books : Steel code IS : 800-2007, Steel tables,
Extracts from IS : 875-1987 for load calculation are allowed.

1. State the mechanical properties that are to be considered in the design of steel structures as per IS : 800-2007.
2. State the different types of welded joint.
3. Sketch any four types of section used for tension members.
- * 4. Write down the formula for calculation of design strength due to yielding of gross section (T_{dg}) as per IS : 800-2007.
5. Define slenderness ratio.
6. What is the effective length for a column whose both ends are restrained against translation and rotation as per code?
7. What is meant by a beam?
8. State any four component parts of a plate girder.

9. What are the loads that are considered in designing a roof truss?
10. Calculate the live load on truss if the angle of slope of roof is 25° .

PART—B

15×4=60

Instructions : (1) Answer *any four* questions.

(2) Each question carries **fifteen** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. A flat of 150 mm × 8 mm is connected to a gusset plate by a lap joint. Design the joint by fillet welds along the sides of the flat only. Design strength of flat may be taken as 270 kN. Take $f_u = 410 \text{ N/mm}^2$; $r_{mw} = 1.25$.
12. Calculate the design tensile strength due to yielding of gross section for ISA 90 × 60 × 6 mm with its longer leg is connected to the gusset plate by fillet welds. Take $f_y = 250 \text{ N/mm}^2$; $r_{mo} = 1.10$.
13. Determine the design compressive strength of single ISLB450@653 N/m, when it is used as a column of effective length 4 m. Take $f_y = 250 \text{ N/mm}^2$.
14. Determine the size of square base plate required for a column of ISHB300@588 N/m carrying a factored load of 1500 kN. Take bearing strength of concrete as 9 N/mm². Take $f_y = 250 \text{ N/mm}^2$; $r_{mo} = 1.10$.
15. State the various design specifications for lacing of a built-up column as per IS : 800-2007.
- * 16. Determine the design bending strength of a laterally restrained simply supported beam ISMB300@442 N/m. Take $f_y = 250 \text{ N/mm}^2$.
17. Write short notes on shear buckling design methods as per IS : 800-2007.
18. Draw a neat sketch of a roof truss and name the component parts.

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