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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2021

DCE - SIXTH SEMESTER EXAMINATION

DESIGN OF 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) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State any four types of rolled steel sections.

2. Write down the formula for determining the design strength of a fillet welded joint (f_{wd}) as per IS : 800-2007

3. Write any four forms of tension members.

4. What are the different types of failures of tension members?

5. Distinguish between column and strut?

6. Define compression member?

7. What is meant by laterally supported beam as per code?

8. Draw a neat sketch of welded plate girder.

9. State any four component parts of roof truss.

10. Calculate live load on truss if the angle of slope of roof is 30º.

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. Calculate the design strength of the welded joint if the size of weld is 5 mm and its length is 200 mm. The ultimate shear stress in the weld is $410 N/mm^2$. Assume connections are made in the workshop.

12. Calculate net area of connected leg and gross area of outstanding leg of a tension member ISA $90 \times 60 \times 8$ mm, if its longer leg is connected to gusset plate.

13. Determine the buckling class of section ISLB 400 @ 569N/m when it is acting as a compression member.

14. Determine the non-dimensional effective slenderness ratio for a column of ISHB 400 @ 822N/m. The effective length of column is 4.0 m. Take $f_y = 250 \ N/mm^2$; $E = 2 \times 10^5 \ N/mm^2$.

15. What are the codal provisions to be followed for the design of battening system as per IS : 800-2007.

16. Determine the design bending strength of laterally restrained simply supported beam ISWB 300 @ 481 N/m. Take $f_y = 250 \ N/mm^2$.

17. Write short notes on shear buckling design methods as per IS : 800-2007.

18. Determine dead load at various panel points for a truss with the following data :

Self weight of GI Sheet = 150 N/mm^2 of slope area;

Self weight of purlin = 100 N/mm^2 of plan area;

Span of truss = 12 m;

Spacing between trusses = 4 m;

Length of principal rafter = 7 m;

Number of panels = 8

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