

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

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B. Tech 6th Semester Examination

Design of Steel Structures-II

CE-6001

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question each from Sections A, B , C and D. Section E is compulsory. All questions carry equal marks. Use of IS: 800 - 2007 and IS: 801-1975 are allowed.

SECTION - A

1. Find out the collapse load for continuous beam shown in figure 1 of uniform cross-section. The value of M_p is constant for all the spans. (20)

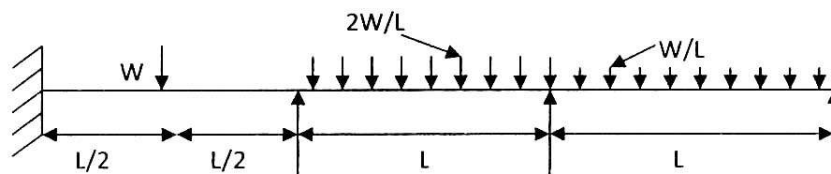


Fig. 1

2. Using the plastic design concept, design a continuous beam of uniform cross section over four spans of 4 m each. The working load acting is 25 kN/m inclusive of self weight of the beam. (20)

SECTION - B

3. (a) Describe the major components of the industrial buildings briefly. (10)

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(b) Design an angle iron purlin for the following data:

Span of roof = 12 m

Spacing of roof trusses = 5m

Spacing of purlins along the slope of roof truss = 1.2 m

Slope of roof truss = 1 vertical : 2 Horizontal

Wing load on roof surface normal to roof = 1.6 kN/m².

Vertical load from roof sheeting = 0.25 kN/m². (10)

4. Design a welded mild steel circular steel tank at Delhi with hemispherical bottom of capacity 60 kilolitres. The lowest point of the tank should be 7 m above ground level. The tank is open at top. The staging need not be designed. $F_y = 250 \text{ N/mm}^2$. (20)

SECTION - C

5. Enumerate the various loads and load combinations to be considered for the design of steel stacks indicating various stresses developed under these loads. What are the stability considerations for the design of steel stacks? (20)
6. Illustrate with diagram the different types of foundations used for the towers. Also describe the design considerations for such foundations. (20)

SECTION - D

7. Compute the axial load for the column with the section shown in figure 2, when $f_y = 230 \text{ N/mm}^2$ and unsupported length of the column is 6m. (20)
8. The beam shown in the figure 2 carries a uniformly distributed load and has a span of 2.0 m. Compute the allowable load on the beam and design suitable welds connecting the two channels. The beam is laterally supported at support points only. (20)

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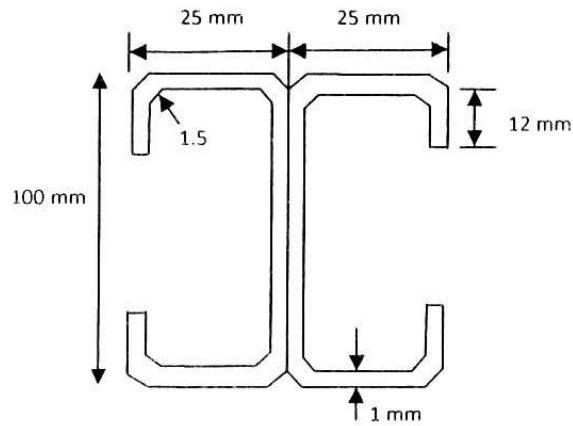


Fig. 2

SECTION - E

9. Attempt any five.
- (a) Define Upper bound and lower bound theorem in plastic analysis.
 - (b) What are purlins and how are they designed?
 - (c) Show with figure the commonly used bracing patterns in the towers.
 - (d) What are cold formed sections and what is their advantage?
 - (e) How is the wind load calculated on the industrial structures?
 - (f) What is the web crippling of beams? (5×4=20)