



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: VI
Class: TY	Program: B.Tech
Branch Code: CIV	Pattern: 20
Name of Course: Design of Steel Structures	Course Code: CIV223014(B)
Max. Marks: 30	Duration: 2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains one page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last column indicates the Course Outcome of the Question/sub-question.
6. Use of IS 800: 2007 and steel table is allowed.
7. Consider $F_y = 250$ MPa and bolts of grade 4.6 wherever required

Marks CO

Question No. 1

- 1 a) Explain in detail different types of steel structures. (5) CO2

Question No. 2

- 2 a) Design an unequal double angle tension member connected on each side of 12 mm thick gusset plate to carry an axial factored load of 250 kN. Use 5 mm shop fillet weld. Design the section for gross section yielding and net section rupture only. (10) CO1, CO5

OR

- 2 b) A double angle section 2 ISA 90x60x10 @ 22.0kg/m is connected back to back to gusset plate of thickness 12mm with 4 bolts of 16mm diameter in one line at pitch of 45mm and the edge distance of 40mm. Determine the design tensile strength of the section. (Assume the section is connected to longer leg and gauge distance = 50mm) (10) CO1, CO5

Question No. 3

- 3 a) A 6m long column is effectively held in position at both ends and restraint against rotation at one end. If an ISHB 350 @ 67.4 kg/m is used, calculate design compressive strength. (5) CO1, CO4

Question No. 4

- 4 a) Design a single equal angle discontinuous strut with bolted connection which carries factored load of 80 kN. Unsupported length of the member is 2.5m. (10) CO1, CO5

OR

- 4 b) Explain factors affecting strength of the compression member. Then Determine design compressive strength of a strut which consists of 2ISA 70x70x8 @ 8.3kg/m and 3.2m long. The angles are placed on the opposite of the 12mm thick gusset plate. Calculate the design compressive strength of the member (10) CO1, CO5

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