(1)

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

B.Tech-VI Semester (~~CSE/IT/BT/ECE~~/CE)

COURSE CODE (CREDITS): 18B11CE612 (3) MAX MARKS: 35

COURSE NAME: DESIGN OF STEEL STRUCTURES

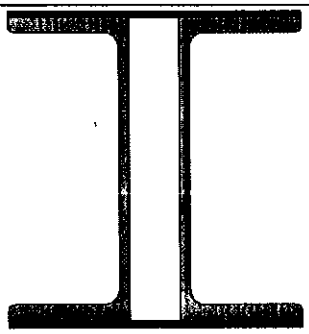
COURSE INSTRUCTOR: Dr. KAUSHAL KUMAR MAX. TIME: 2 Hours

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is allowed, IS codes are allowed.

Q.No	Question	CO	Marks
Q1	An ISA 120 mm × 120 mm × 12 mm angle section is subjected to a factored tensile load of 200 kN and is connected to a 12 mm thick gusset plate. Design a bolted connection using High Strength Friction Grip (HSFG) bolts for the case: (a) Slip is not permitted at the service load, and Assume the structural steel used is of Fe 410 grade.		6
Q2	Two plates of thickness 12 mm and 16 mm are to be joined by a groove weld. The joint is subjected to a factored tensile force of 300 kN. Assuming an effective length of 150 mm, check the safety of the joint for ***a) Single-V groove weld joint and,*** ***b) Double-V groove weld joint.*** Assume Fe 410 grade steel plates and that the welds are shop welded.		6
Q3	A tension member 3.6 m long carries a factored tensile load of 240 kN. Design a suitable single angle unequal section when connection is made with 18 mm diameter bolts of grade 4.6. Assume longer leg to be connected with plate.		7
Q4	Design a laced column 11.0 m long to carry factored axial load of 1100 kN. The column is restrained in position but not in direction at both the ends. Use 2 channel section placed as back to back as shown in the figure.		7

			
Q5	A cantilever beam of length 4.0 m supports a dead load (including self weight) of 20 kN/m and a live load of 15 kN/m. Assume a bearing length of 120 mm. Design the beam.		**6**
Q6	State the purpose of a gantry girder in an industrial building and list the forces acting on it.		**3**