BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH/BARCH **SEMESTER : VI**
BRANCH: CIVIL/BARCH **SESSION : SP/2024**

SUBJECT: CE308 STRUCTURAL DESIGN-II

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. IS800:2007 and steel table is allowed in the examination

			CO	BL
Q.1(a)	Define the following: a. Limit state. b. Compact section. c. Strain hardening. d. Strut. e. Plastic collapse.	[5]	1	1
Q.1(b)	List out the important physical properties of steel irrespective of its grade.	[5]	1	1
Q.2	The 10 mm thick bracket plate shown in Figure Q2 is connected with the flange of column ISHB 300 @ 577 N/m. Find the size of the weld to transmit a factored load of 250 kN.	[10]	3	4

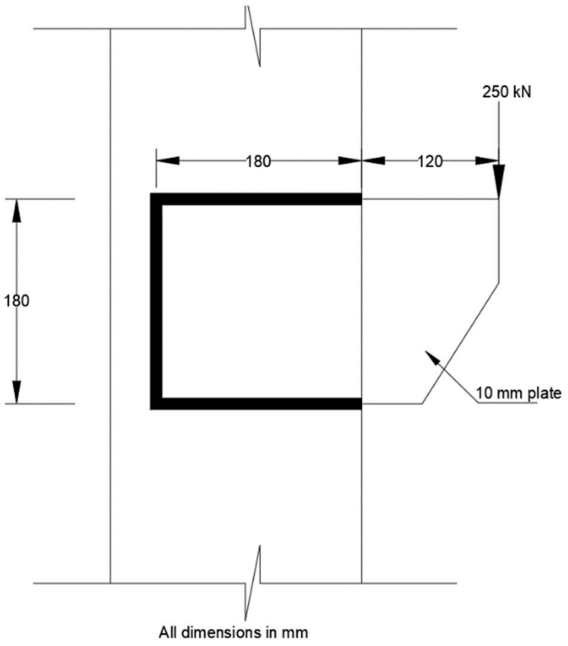

Figure Q2

Q.3	Design a double angle tension member connected on each side of a 10 mm thick gusset plate, to carry an axial load of 250 kN. Use 20 mm black bolts of grade 4.6. Assume shop connection.	[10]	2, 3	4
Q.4(a)	Determine the design axial load capacity of the column ISHB 300 @ 577 N/m if the length of column is 3 m and its both ends pinned.	[5]	2	3
Q.4(b)	A strut 3 m long consists of two angles ISA 100 x 100 x 6. Find the factored strength of the member if the angles are connected on both sides of 12 mm gusset by one bolt.	[5]	2	3

PTO

Q.5(a)	An ISMB 500 section is used as a beam over a span of 6 m, with simply supported ends. Determine the maximum factored uniformly distributed load that the beam can carry if the ends are restrained against torsion, but compression flange is laterally unsupported. The section is found to be adequate for shear, deflection, web buckling and web crippling.	[5]	2,4	4
Q.5(b)	Determine the shape factor of triangular section shown in Fig Q5b about the axis shown below. The dimensions are in mm.	[5]	4	3

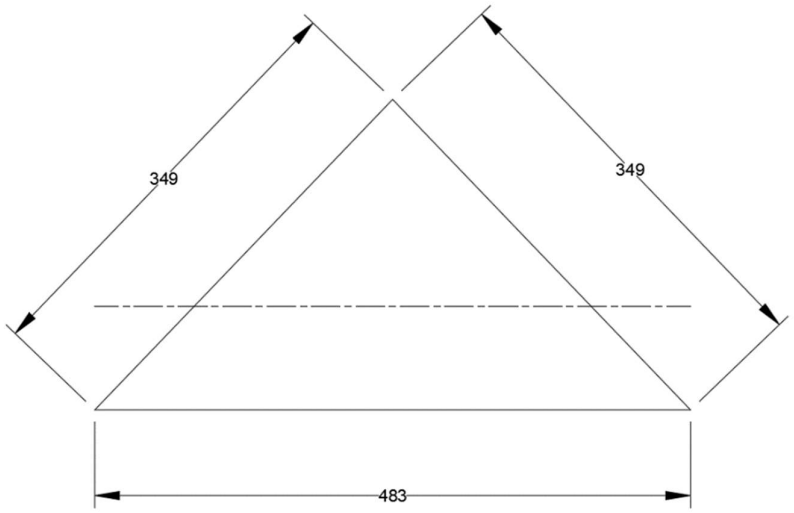

Figure Q5b

::::::25/04/2024::::::M