PRN:		Course Code:	PSE202

First Year **M. Tech** End Semester Examination Winter 2024

Advanced Design of Steel Structures 000420

Day and Date: Mon 2 DEC 2024 Max Marks: **50**

Time: 02:00PM To 04:00PM Duration: **02** hrs

Instructions:
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.
4) Use of IS 800(2007) and Steel table is allowed

		Marks	Bloom's Level	CO
Q.1	**Solve the following (any One)**			
a)	Design single angle strut to carry a compression of 150 kN. The length of the strut is 3.0 m between the intersections. Use bolted connection. Assume Fy= 250 N/mm^2 and Fu= 410 N/mm^2	12	L_4	1
	OR			
b)	Determine the design tensile strength of a member of roof truss consists of 2ISA 90x90x10 mm connected to both side of 10 mm thick gusset plate by fillet weld. Assume Fy= 250 N/mm^2 and Fu= 410 N/mm^2	12	L_4	1
Q.2	**Solve the following (any One)**			
a)	Design a square hollow purlin section for the following data under service condition. The grade of the steel is E250. Spacing of roof truss = 4.0 m UDL on minor axis = 2.5 kN/m UDL on Major axis = 1.5 kN/m	12	L_4	2
	OR			
b)	Design a tubular section to carry a compression of 100kN. The center-to-center distance between the end connections is 2.5 m. Also design the welded end connection. The grade of the steel is E250.	12	L_4	2
Q.3	**Solve the following (any two)**			
a)	Define shape factor and Determine shape factor for a rectangular and circular section.	07	L_2	3
b)	Determine collapse load for a simply supported beam subjected to	07	L_2	3

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central point load W.

OR

c) Determine plastic moment, M_p and the value of P required to cause collapse using the virtual work method for a propped cantilever beam shown in fig.1. | 07 | L_2 | 3

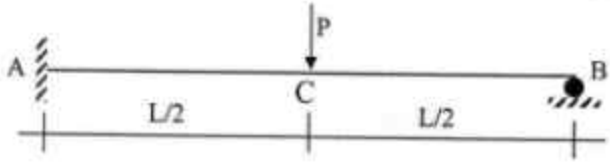


Fig. 1

Q.4 Solve the following (any one)

a) Determine the maximum of plastic moment for a continuous beam shown in fig 2 | 12 | L_3 | 4

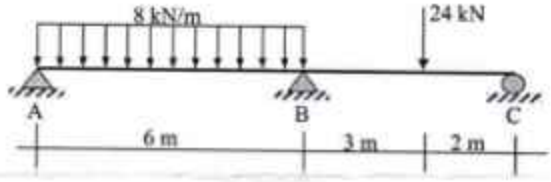


Fig .2

b) Determine the maximum moment plastic from the frame shown in fig.3. | 12 | L_3 | 4

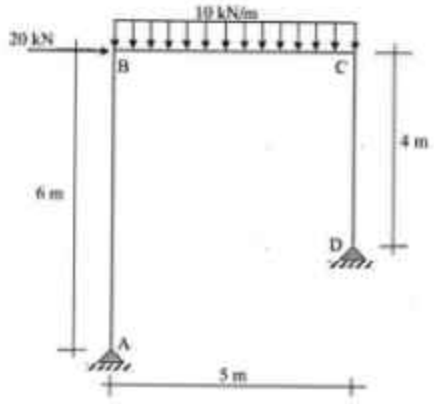


Fig. 3.

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