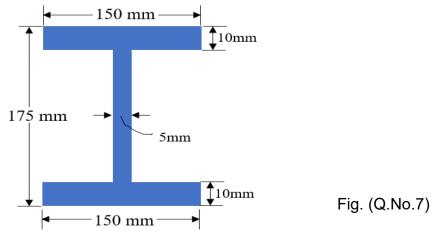
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	GAIN MORE KNOWLEDGE REACH GREATER HEIGHTS BENGA		RSI	ΤY	·	·		·						
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	END TERM EXAMINATION – AUGUST-2024													
Even Semester: 2023 - 24					Date: 20 August 2024									
Course Code: CIV 6008						: 9.3			2.3	0PN	1			
Course Name: ADVANCED DESIGN OF STEEL STRUCTURES						Max Marks: 100 Weightage: 50%								
	Program & Sem: M.TECH (BCT) & II				v	verg	παυ	je. (507	0				
	Instructions: (i) Assume any data if required. (ii) Use of IS800 and SP-6(1) Steel tables are a	allowed												
Part A [Memory Recall Questions]														
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	Answer any FOUR Questions. Each question			-	ks.		(4	4Qx	51	/I=	201	/I)		
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Page 1 of 2

- Find the collapse load for simply supported beam with uniformly distributed load (w/m) over the entire span of length L(m).
 (C.O.No.2) [Comprehension]
- Design the principal rafter of a fink type roof truss for the following data: Design compressive load = 175 kN, design tensile load = 70 kN, length of rafter panel =2.235m, Use Fe415 grade steel. Take Ym0 = 1.10 and Ymb = 1.25. (C.O.No.3) [Comprehension]
- 10. Design the compression member of a roof truss for the following data. Design compressive load = 165kN Design tensile load = 60kN, Length of rafter panel =3m Use Fe415 grade steel. Take Ym0 = 1.10 and Ymb = 1.25. (C.O.No.3) [Comprehension]
- 11. Fire protection methods are basically dependent on the fire load, fire rating and the type of structural members. Explain in detail the commonly used fire protection methods.

(C.O.No.4) [Comprehension]

Part C [Problem Solving Questions]

Answer any TWO Questions. Each question carries 20 marks (2Qx20M=40M)

12. Design a gantry girder to be used in an industrial building carrying manually operated overhead travelling crane for the following data:

Crane Capacity = 220 kN , Self-Weight of Crane Girder excluding Trolley = 200 kN

Self-Weight of Trolley, Electric Motor, Hook, etc. = 40kN

Appr. Minimum Approach of Crane Hook to the Gantry Girder = 1.20 m,

Wheel Base = 3.2 m

Centre-to-Centre Distance between Gantry Rails = 17 m

Centre-to-Centre Distance between Columns (Span of Gantry Girder) =8 m Self-Weight of Rail Section = 300 N/m, Diameter of Crane Wheels = 150mm

Assume $f_u = 410$ MPa, $f_v = f_{vw} = f_{vf} = 250$ MPa.

(C.O.No.3) [Application]

- 13. Design the principal tie member of a fink type roof truss for the following data. Design also its connection with a 12mm thick gusset plate using 20mm diameter bolts of grade 4.6. Design tensile load = 200 kN
 Design compressive load = 60kN
 Length of rafter panel =5m
 Use Fe415 grade steel. Take Ym0 = 1.10 and Ymb = 1.25
 Perform check for block shear strength. (C.O.No.3) [Application]
- 14. Determine a) Heated perimeter b) section factor c) limiting steel temperature d) exposed area to mass ratio and e) the time at which limiting temperature is attained for the I-Section ISMB 500 @86.9 kg/m beams supporting a concrete floor for the following cases: Case 1: 3-sided Exposure Case2: 4-sided exposure Take load factor $r_f = 0.866$ and mass of steel = 7850kg/m³ (C.O.No.4) [Application]