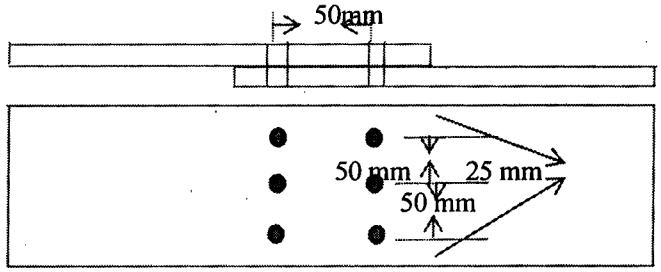
Ref. No. EX/CON/PC/B/T/222/2024

B. Construction Engineering 2nd Year, 2nd SemesterExamination – 2024
Subject: Design of Structure-I(Steel)

Total Time:3 hour
Full Marks: 100

(50 Marks for each Part)

PART-I, (Full Marks-50)
Use separate Answer Sheet for each part, IS800 is allowable in the exam hall.

CO1 [10]	[1]Answer any two questions in this block.[5×2=10] Classify the section (a),ISLB300@370kg/m.(b) ISHB400@806 Kg/m (c) ISWB450@779 Kg/m.
CO2 [10]	[2]Determine the axial load carrying capacity of the column ISMB350@514 kg/m if the length of the column is 6 m and its one end fixed and other end pined. [10]
CO3 [10]	[3] Find the efficiency of lap joint. Given M24 Bolt of grade 4.8 and Fe-410(E250) plate are used. F_{yb}=320MPa., f_{ub}=420MPa.[10] 
CO4 [10]	[4]Answer a or b in this block. (a)Design a simply supported beam of 8m span resting on a support of 400×400 mm and carrying a concentrated load of 400KN at mid span. [10] (b)Design a welded plate girder of span 20m to carry a superimposed load of 30KN/m. avoid use of bearing and intermediate stiffener.[10]
CO5& CO6 [10]	[5]Answer a or b in this block. (a)A column 5 m long has to support a factored load of 3600Kn. The column is held effectively at both ends and restrained in direction at one end. Design the column using beam section and plate. [10] (b) Design a Slab base foundation for a column ISHB 300@618 Kg/m carrying an axial factored load of 1200KN. M25 Grade of concrete is used for the foundation. provide welded connection between column and base plate or bolted connection. [10]

The students of the course should be able to
CO1: Understand the design philosophy, advantages & limitations of Steel Structures (K2).
CO2: Analyse & Design of Tension, Compression & Truss Members (K4)
CO3: Application of analytical skill for illustration of different Joints (K3)
CO4: Analyse & Design of Flexural Members, Beams, Plate-Girder & Rolled sections (K4)
CO5: Analysing and design of welded, Riveted & Bolted Connections (K4)
CO6: Calculate reaction forces for connections with Eccentricity (Moment & Torsion)(K3)

[Turn over

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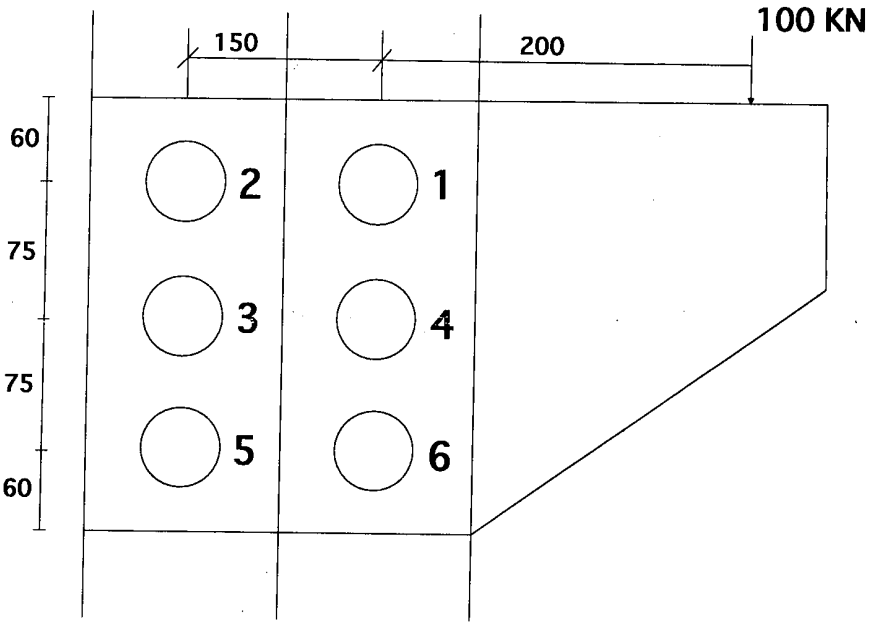
B. Const. Engg. 2nd YEAR EXAMINATION, 2024

(2nd Semester)

SUBJECT: DESIGN OF STEEL STRUCTURE I (STEEL)

Time : Three Hours

Full Marks:

No of Questions	Part II	Marks
CO1:10 Q1.	Explain the Philosophy of Limit State of Design in Steel. Comment/Explain on Preference of Plastic Section in Limit State of Steel Design Concept.	10
CO3:20 Q2.	Design a Cantilever Beam of Length 4.6 meter, to Support a Dead Load (Including Self Weight) of 18 KN/m and Live Load 11 KN/m. Design a Beam Fulfilling Limit State of Design Criteria.	20
CO4:20 Q3.	Find Force at every bolt due to direct shear and moment in this moment connection. 	20