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09ENG6.5

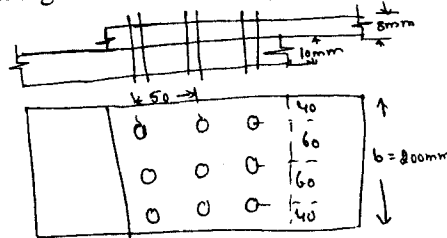
Sixth Semester B.Arch. Degree Examination, Dec.2016/Jan.2017
Structures – VI

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any FIVE full questions.**
2. Use of IS800, steel tables is permitted.
3. Assume any missing data.

- 1 a. Determine the efficiency of the lap joint shown in Fig. Q1 (a). Use M16 property class 5.6 bolts. The grade of plate is 410 N/mm². (Fig. Q1 (a)) (14 Marks)
 b. Explain the advantages and disadvantages of bolted connections. (06 Marks)



All dimensions in mm

Fig. Q1 (a)

- 2 a. Determine the bracket load it can carry for the shown connection. Use M20 bolts with property class 4.6 (Fig. Q2 (a)) (12 Marks)

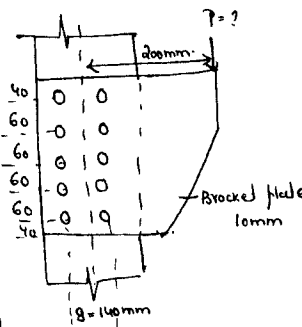
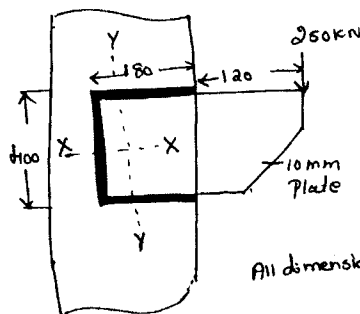


Fig. Q2 (a)

All dimensions in mm

- b. Explain the advantages and disadvantages of structural steel. (08 Marks)
 3 a. The 10 mm thick bracket plate shown in Fig. 3 (a) 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. (14 Marks)



All dimensions in mm

Fig. Q3 (a)

- b. Explain the advantages and disadvantages of welded connections. (06 Marks)

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or questions written on the question paper will be treated as malpractice.

- 4 Determine the tensile strength of a roof truss member 21SA, 90×60 , 6 mm connected to the gusset plate of 8 mm thickness by 4 mm weld as shown in Fig. Q4 (a). The effective length of weld is 200 mm. Fig.4. (20 Marks)

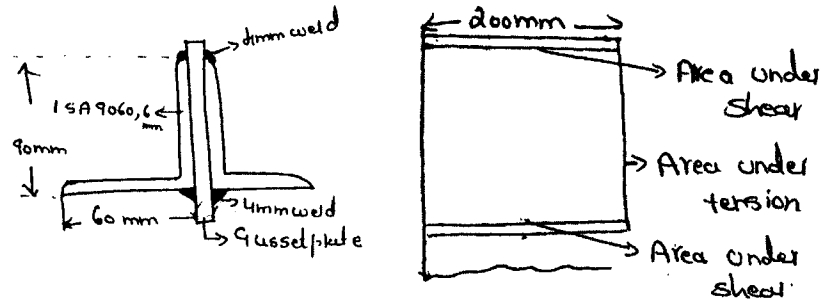


Fig. Q4

- 5 a. Write the effective length of the columns with different end conditions. (06 Marks)
 b. 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. (14 Marks)
- 6 Design a slab base for a column ISHB 300 @ 577 N/m carrying an axial factored load of 1000 kN. M20 concrete is used for the foundations. Provide welded connections between column and base plate. (20 Marks)
- 7 Design a simply supported beam of effective span 1.5 m carrying a factored concentrated load of 360 kN at mid span. (20 Marks)
- 8 Write short notes on:
 a. Fire protection of steel structures.
 b. Modes of failure of bolts.
 c. Lap joints and butt joints.
 d. Types of bolts. (20 Marks)

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