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09ENG65

Sixth Semester B.Arch. Degree Examination, Dec.2019/Jan.2020
Structures – VI

Time: 3 hrs.

Max. Marks:100

- Note:** 1. Answer any FIVE full questions.
 2. Use of IS800 – 2007 SP – 06 Hand Book and Steel table is permitted.
 3. Missing data, if any, may be suitably assumed.

- 1 a. Explain how limit state method differs from working stress method of design. (10 Marks)
 b. What are the common steel structures? Mention advantages and disadvantages of steel structures. (10 Marks)
- 2 a. Define following terms with a neat sketch:
 i) Pitch of the bolts
 ii) Gauge distance
 iii) Edge distance
 iv) End distance
 v) Staggered distance (05 Marks)
- b. Find the efficiency of the lap joint shown in Fig.Q2(b). Given: M20 bolts of grade 4.6 and Fe410 plates are used. (15 Marks)

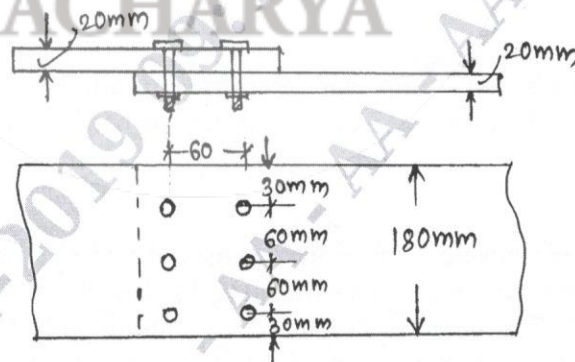
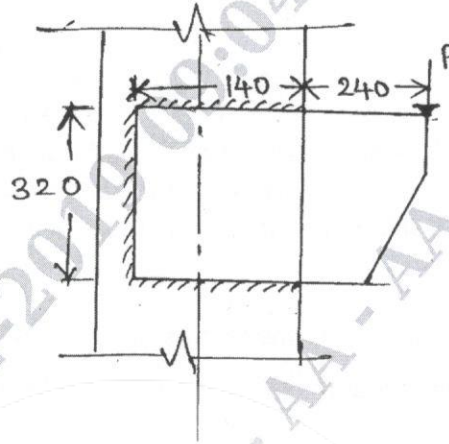


Fig.Q2(b)

- 3 a. Explain advantages and disadvantages of welded connection over bolted connection. (08 Marks)
- b. A tie member of a roof truss consists of 2 ISA 100 × 75 × 8 mm. The angles are connected to either side of a 10 mm gusset plates and the member is subjected to a working pull of 300 kN. Design the welded connection. Assume connections are made in the workshop. (12 Marks)

- 4 a. What are the different types of welded joints? Draw neat sketches. (08 Marks)
 b. Determine the maximum load that can be resisted by the bracket shown in Fig. Q4 (b), by fillet weld of size 6 mm, if it is shop welding. (12 Marks)



All dimensions are in mm

Fig. Q4 (b)

- 5 Design a built up column using double channel back to back to carry a load of 1000kN. The effective height of the column is 4m. Also design suitable lacing system. Draw neat sketch. (20 Marks)
- 6 Design a slab base for the column ISHB – 400 to carry a load of 1000kN. Use M_{20} concrete for the concrete base. Also design concrete base if SBC of soil is 200kN/m^2 . Design welded connection between column and slab base. Draw neat sketch. (20 Marks)
- 7 Design a simply supported laterally supported beam of span 5m and subjected to a load of 30kN/m (live load). Check the beam for M.R, shear and deflection. Use Rolled steel beams only. (20 Marks)
- 8 A hall measuring $15\text{m} \times 6\text{m}$ consists of beams spaced at 3 m c/c. R.C.C. slab of 130mm is cast over the beams. The finishing load is 1.5kN/m^2 and the imposed load on the beam is 5kN/m^2 . The beam is supported on 300mm wall. Design an intermediate beam & check the design for deflection, web crippling and web buckling. (20 Marks)
