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Sixth Semester B. Arch Degree Examination, Dec.2015/Jan.2016
Structures – VI

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer any FIVE full questions.**
2. Use of IS – 800 – 2007 and steel table is permitted.
3. Missing data, if any, may be suitably assumed.

- 1 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. (06 Marks)
- b. Find the efficiency of the lap joint shown in Fig. Q1(b), given : M20 bolts of grade 4.6 and Fe410 plates are used thickness of plate is 20 mm. (14 Marks)

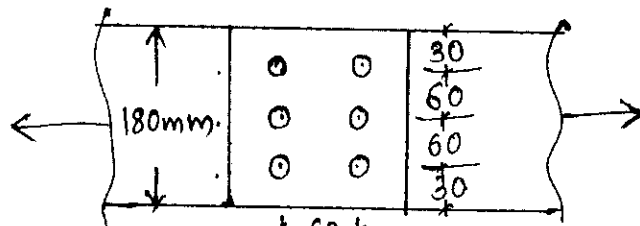


Fig.Q1(b)

- 2 a. Explain advantages and disadvantages of welded connections. (08 Marks)
- b. A tie member of a roof truss consists of 2ISA 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)
- 3 a. What are the different types of welded joints? Draw neat sketches. (06 Marks)
- b. Determine the maximum load that can be resisted by the bracket shown in Fig. Q3(b), by fillet weld of size 6 mm, if it is shop welding. (14 Marks)

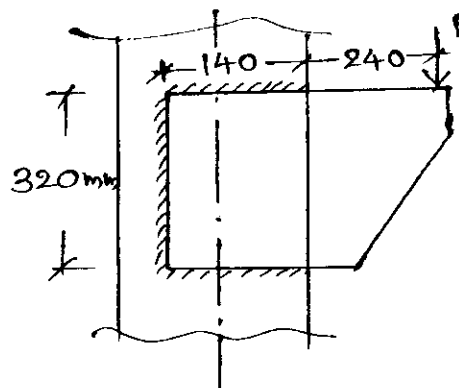


Fig.Q3(b)

- 4 Design a double angle tension member connected on each side of a 10 mm thick gusset plate, to carry an axial factored load of 375 kN. Use 20 mm black bolts. Assume shop connection. **(20 Marks)**
- 5 In a truss a strut 3 m long consists of two angles ISA 100 × 100 × 6 mm. Find the factored strength of the member if the angles are connected on the both sides of 12 mm gusset by :
i) One bolt
ii) two bolts
iii) welding, which makes the joint rigid. **(20 Marks)**
- 6 a. Give design steps in lacing system. **(10 Marks)**
b. Design a column with two channels back to back of length 10 m to carry an axial factored load of 1400 kN. The both ends are hinged. **(10 Marks)**
- 7 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 foundation. Provide welded connection between column and base plate. **(20 Marks)**
- 8 Write short notes on :
a. Fire protection for steel structures
b. Difference between limit state and working stress method
c. Advantages and disadvantages of bolted connection
d. Modes of failure of bolts under tensile force. **(20 Marks)**

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