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09ENG6.5

**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.

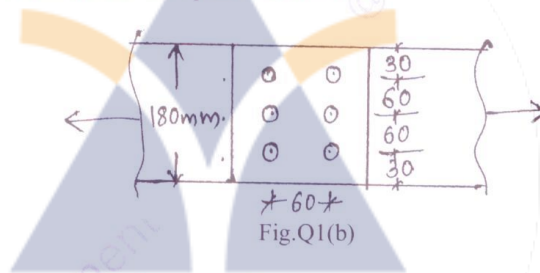
2. Use of IS – 800 – 2007 and steel table is permitted.

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)



- 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)

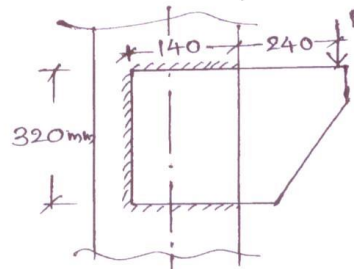


Fig.Q3(b)
1 of 2

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 equations written eg. 42+8 = 50, will be treated as malpractice.



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- 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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