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09ENG6.5

Sixth Semester B.Arch. Degree Examination, June/July 2017

Structures – VI

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions.***
2. ***Use of IS 800 and SP-6(1) permitted.***

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.

1 a. State and explain "design strength of a bolt". **(06 Marks)**

b. Two plates of 410 grade and of thickness, 8 mm each are lap jointed using 16 mm dia bolts of grade 4.6 calculate the design strength of bolt. **(14 Marks)**

2 Calculate the design load 'P' for the joint shown in Fig.Q2. 18 mm dia grade 4.6 bolts are used.

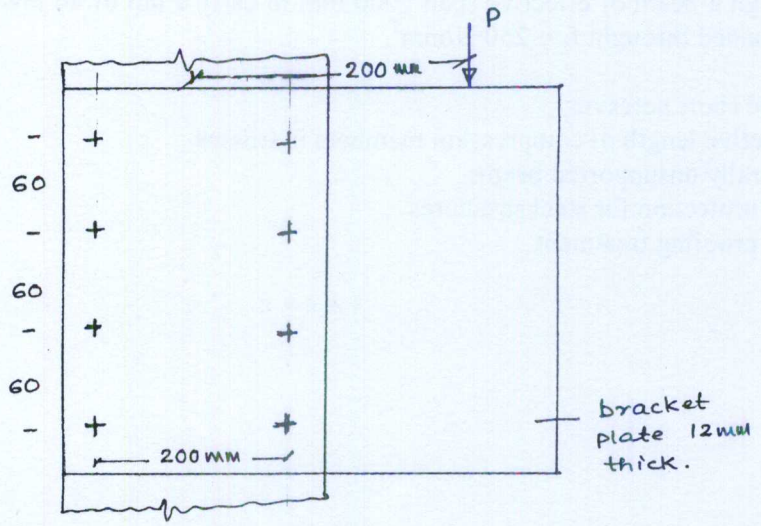

Fig.Q2 **(20 Marks)**

3 Calculate the size of weld required for the joint shown in Fig.Q3.

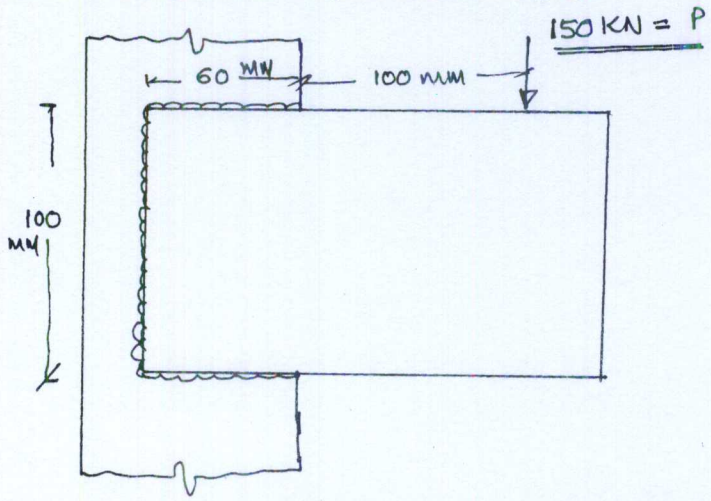

Fig.Q3 **(20 Marks)**

4 2, ISA 80 × 80 × 8 mm placed back to back and connected to both sides of a gusset plate, using 5 Nos 16 mm dia bolts. Calculate the design load the member can carry as a tie member. **(20 Marks)**

5 Determine the design axial load on the column ISMB 350 @ 52.4 kg/m, given the length of the column is 3000 mm, if

a. Ends are fixed
b. Ends are hinged
c. One end is fixed and other hinged
d. One end is fixed and other free. **(20 Marks)**

6 Design a slab base for a column ISHB 250 @ 51 kg/m, to carry an axial design load of 900 KN. 410 grade steel and M_{25} concrete are used. Sketch the details of connections. **(20 Marks)**

7 Design a beam of effective span 5000 mm to carry a udl of 40 kN/m. The beam is laterally restrained throught $f_y = 250$ N/mm^2. **(20 Marks)**

8 Write short notes on:

a. Effective length of compression members in trusses
b. Laterally unsupported beams
c. Fire protection for steel structures
d. Fire proofing treatment **(20 Marks)**

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