



USN 

--	--	--	--	--	--	--	--	--	--

09ENG6.5

**Sixth Semester B.Arch. Degree Examination, June/July 2018**  
**Structures – VI**

Time: 3 hrs.

Max. Marks: 100

**Note: 1. Answer any FIVE full questions.**  
**2. Use of IS:800 and Steel tables is allowed.**  
**3. Assume any missing data suitably.**

- 1 a. Define Pitch, Staggered pitch, edge distance, Gauge distance and Bolt value. (05 Marks)  
b. Determine the bracket load 'P' that connection can carry. Use M18 bolts with property class 5.6. Refer Fig.Q1(b) and assume missing data. (15 Marks)

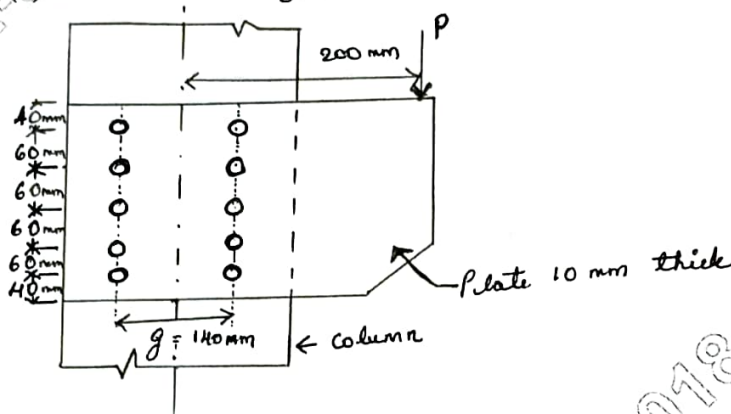


Fig.Q1(b)

- 2 a. Write a note on welding methods. (08 Marks)  
b. A tension member ISMC 300 connected to gusset plate using welded connection to carry a load equal to full strength of the member. Design welded connection for given member as shown in Fig.Q2(b). (12 Marks)

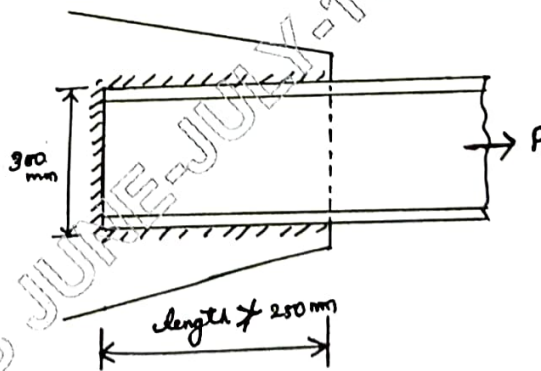


Fig.Q2(b)

- 3 a. What are the advantages and disadvantages of welded connection? (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 equations written eg. 42+8 = 50, will be treated as malpractice.

- b. A T-section of size  $150 \times 150 \times 10$  mm is welded to a column as shown in Fig.Q3(b). Determine the bracket load it can carry. Take size of weld of as 8 mm. (14 Marks)

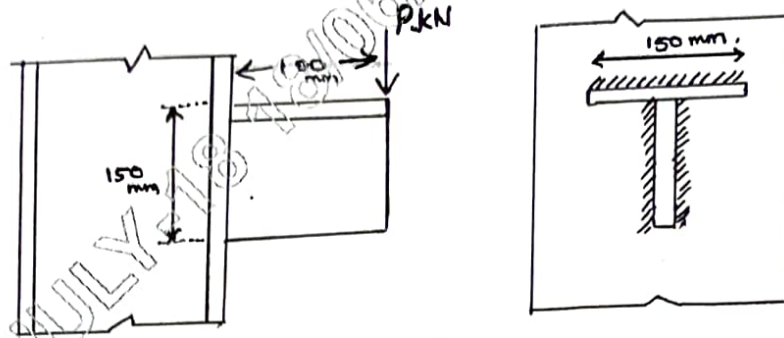


Fig.Q3(b)

- 4 Design a tension member using single angle section to carry load of 180 kN. Use HSFG bolts of M20 with property class 8.8. Do the necessary check. (20 Marks)
- 5 Design a column section using double channels back to back to carry a factored load of 2000 kN. The height of the column is 5 m with both the end hinged. Also design a suitable lacing system. (20 Marks)
- 6 Design a slab base for a column ISHB 300@ 58.8 kg/m carrying an axial factored load of 1000 kN. M20 concrete is used for foundation. Provide welded connection between column and base plate. Draw plan and elevation of slab base. (20 Marks)
- 7 Design a beam for a roof of size  $7.5\text{m} \times 12\text{m}$ . Provided 100mm thick RC slab supported on steel beams at 3m apart c/c. Live load and finishing load taken as  $4\text{ kN/m}^2$  and  $1\text{ kN/m}^2$  respectively. Take limiting deflection as  $\text{span}/250$ . Assume wall thickness, self weight of beam as 250 and 1 kN/m respectively. (20 Marks)
- 8 Write short notes on :
- Fire protection for steel structures
  - Defects in welded connection with sketches
  - Advantages and disadvantages of Bolted connection over welded
  - Types of compression and Tension members used with sketches
- (20 Marks)