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09ENG65

Sixth Semester B.Arch. Degree Examination, June/July 2023
Structure – VI

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

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. 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)
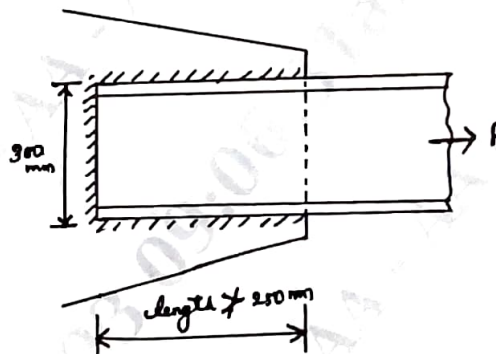

300 mm

→ P

length ≯ 250 mm

Fig.Q2(b)

3   a. Explain advantages and disadvantages of welded connection.   (08 Marks)
    b. Design a welded connection for an angle ISA 100×75×8mm subjected to a working pull of 150kN. Assume connections are made in workshop.   (12 Marks)

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   In a truss a strut 3m long consist of two angles ISA 100×100×6mm. Find the factored strength of the member if the angles are connected on both sides of 12mm gusset by
    i) One bolt
    ii) Two bolts
    iii) Welding, which makes the joint rigid?   (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.   Explain the design steps involved in lacing system.   **(10 Marks)**

    b.   Mention the advantages and disadvantages of bolted connection and explain the following terms with a neat sketch.
i) Pitch of bolts
ii) Gauge distance
iii) End distance
iv) Edge distance
v) Staggered distance.   **(10 Marks)**

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