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Sixth Semester B.Arch. Degree Examination, June/July 2019
Structures - VI

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions.*
2. *Use of IS800 – 2007, SP6 and Steel Table allowed.*
3. *Assume missing data suitably.*

1 a. What are the advantages and disadvantages of steel structure?   **(08 Marks)**
   b. Determine the bolt value for M22, G5.6 property class bolts applied in double shear. Assume threads in shear plane. Bolts are used to connect 2ISA100 × 100 × 8mm angle with 10mm thick Gusset plate.   **(12 Marks)**

2 a. What are the advantages and disadvantages of welded connection with bolted connections?
                                                                                        (04 Marks)
   b. Calculate the load 'P' that can be transmitted through eccentric welded connection as shown in Fig Q2(b). Take size of weld = 6mm
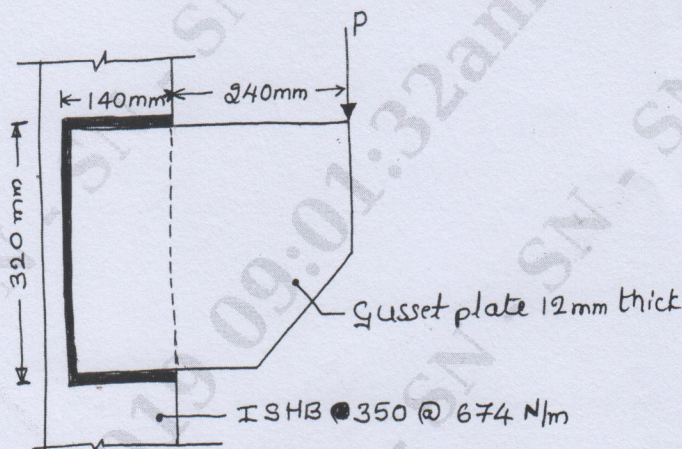

Fig Q2(b)   **(16 Marks)**

3 A tie member of a roof truss consists of 2ISA 125 × 75 × 10mm. The member is subjected to a tensile force of 250kN. The angles are connected on either side of a gusset plate 10mm thick with longlegs back to back. Design the tie member with all necessary strength checks assuming fields weld.   **(20 Marks)**

4 Design a tension member using single angle section to carry load of 200kN. Use M20, Grade 5.6 both. Check for yield strength rupture strength and block shear strength.
                                                                                        (20 Marks)

5 Design a strut using double angle section to carry load of 200kN length of member is ℓe = 3m. Use welded connection.   **(20 Marks)**

6   Design a column with single lacing using double channel section back to back to carry a load of 1500 kN. Take L = 4.5m. Use Indian standard flat for design of lacing. Draw neat sketch.

(20 Marks)

7   Design a slab base for a column ISHB 300@ 577 N/m carrying an axial factored load of 1000kN. Base plate is resting on an RCC pedestal of M20 grade concrete. Use welding to connect column with base plate. Draw neat sketch.

(20 Marks)

8   Design a rolled steel beam using Indian standard I – section simply supported with a clear span of 6m and width of supports 300mm. Check the beam for resistance against external moment, shear and deflection. Take the service load 20kN/m acting on the beam inclusive of self weight.

(20 Marks)

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