Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. Structural Design (2016 & Onwards) (Sem.–2)

ADVANCE STEEL DESIGN

Subject Code : MTSD-203

Paper ID : [74292]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions.
2. Each question carries TWENTY marks.
3. Any missing data may be assumed appropriately.

1. Symmetric trusses of span 20m and height 5m are spaced 4.5m c/c. Design the channel section purlins to be placed at suitable distances to resist the following loads :

   Weight of sheeting including bolts = 171 kN/m^2

   Live load = 0.4 kN/m^2

   Wind load = 1.2 kN/m^2 (Suction)

   Spacing of purlins = 1.4 m

   Design the purlin as per IS 800-2007

2. An 1SLB 300 carrying UDL of 50 kN/m has effective span of 8m. This is to be connected to the web of the girder ISMB 450. Design the frame connection using 20mm dia shop bolts.

3. Design a riveted self supported steel stack located in the outskirts of Bhopal for the following data :

   Terrain category 2

   Topography almost flat

   Height of the steel stack 80m

   Diameter of the steel stack 3m

   Thickness of brick lining 100mm

   Corrosional Allowance 3mm

   Design the Stack at the base. Also design the base plate and the anchor bolts.

4. Design a guyed steel stack for the following data :

   Diameter = 1.5m

   Height = 30m

   Shape factor = 0.7

   Average wind Pressure = 1.2 kN/m^2

   Assume the intial tension in the guyed wire = 35N/mm^2

   Total corrosional Allowance = 4.5mm

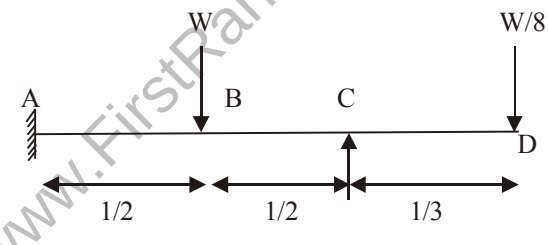
5. Two channels of 180×80mm section with bend lips are connected with webs to act as beam. Thickness of the plate is 2.5mm and the depth of the lip is = 25mm. The beam has an effective span of 4.1m. Determine the allowable load per meter run on the beam. Take fy = 250 N/mm^2

6. A hat of 100×80×4mm section with a 25mm lip is to be used as a concentrically loaded column of 3.1m effective length. Determine the allowable load. Take fy = 250 N/mm^2.

7. a) Find the shape factor of a T-section with the flange of 150×10mm and web 200×10mm?

   b) What are the advantages of cold formed steel structural members over hot rolled steel structural members?

8. A propped cantilever ABCD is loaded as shown in figure. Find the collapse load if the beam is of uniform cross section.



AB=BC=CD=Mp