Total No. of Questions : 6] SEAT No. :

P3755

[Total No. of Pages : 2

[4760] - 42

M.E. (Civil - Structures)

ADVANCED DESIGN OF METAL STRUCTURE

(2008 Pattern) (Elective - I) (Semester - I)

Time : 4 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Solve any two questions from each section.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Use of Calculator and relevant IS codes is allowed.***
6) ***Assume Suitable data if necessary.***

SECTION - I

Q1) Suggest structural configuration of hoarding structure to be installed at height of 20 m above ground level. The display board is of dimensions 20 m wide, 10 m height. Calculate the loads due to wind on the members of support structure. Draw free body diagram of structures showing the forces and reactions. **[25]**

Q2) a) Explain fabrication of beams into castellated beam. **[9]**

b) What are the advantages and disadvantages of castellated beam? **[6]**

c) Explain behavior of castellated beam in flexure and shear. **[10]**

Q3) a) Compare steel and aluminum structural sections. And applications. **[7]**

b) Compare and Draw stress-strain diagram of aluminum and steel. **[7]**

c) Find flexural and shear stresses in IS ALB 150 at 12.1 kg/m when loaded with udl of 20 KN /m on span of 4 m. **[11]**

SECTION - II

Q4) a) Differentiate geometry and structure of Microwave tower and transmission tower carrying high tension electric wire. **[5]**

b) Draw typical structural arrangement of both **[5]**

c) Draw typical Free body diagram with conventional loads on each type of tower. **[5]**

P.T.O.

d) Design the foundation bolt for transmission tower .one of the four legs with angle section has to transfer tensile reaction of 750 KN to foundation block. The cross- section of tower leg is ISA 125.125.10. Draw design details of connection. **[10]**

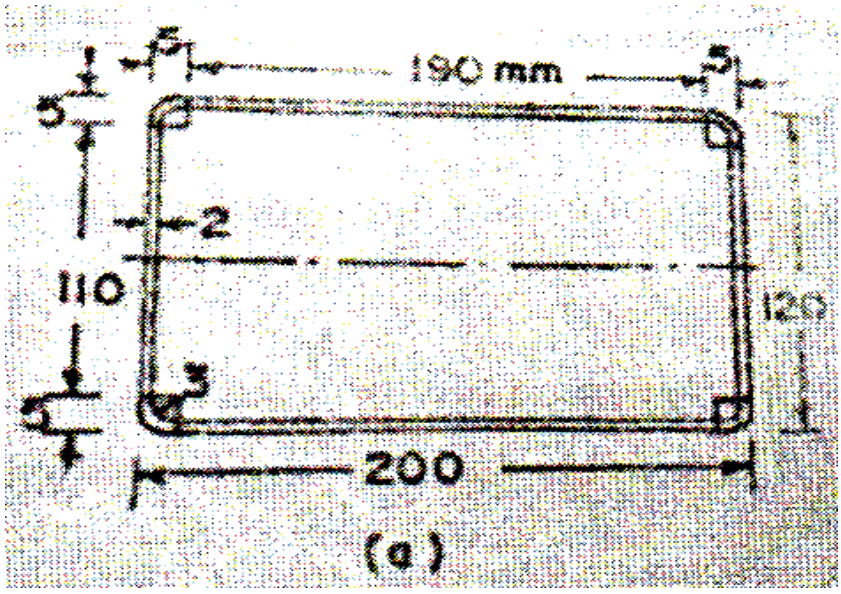
Q5) a) State advantages and disadvantages of tubular structural sections used in steel structures **[6]**

b) What are the design considerations of tubular structure **[6]**

c) Design scaffolding support structure for RCC slab 220 mm thick ,span between beams is 4 m. **[13]**

Q6) a) Explain manufacturing of light gauge structural members. **[10]**
Enlist its advantages over conventional sections

b)



Find the allowable load for the rectangular tubular column section show in fig. The effective length of column is 3.3 m.Take fy=235N/mm^2. **[15]**

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