Total No. of Questions : 6]

SEAT No. :

P4185

[Total No. of Pages : 2

[4960]-41

M.E. (Civil) (Structure)

ADVANCED DESIGN OF METAL STRUCTURES

(2008 Pattern) (Elective - II)

Time : 4 Hour] *[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 is allowed.***
6) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) A Hording structure is to be designed supported by two built up columns as back up structure. The display board is 30 m wide and 18 m height. The board is supported on built up back up structure from ground ,the bottom edge of board being at height of 15 m from ground. Draw schematic diagram of back up structure and hoarding structure with structural parts. **[8]**

b) Give design considerations and design steps to design this hoarding. **[9]**

c) Calculate design force at foundation level. **[8]**

Q2) a) Explain castellated beams with neat sketch, state its advantages and disadvantages. **[8]**

b) Calculate the sectional properties of castellated beam made from I section, web 8 mm thick, depth of web 500mm, Flange 12 mm thick ,150 mm wide. **[9]**

c) State expression of maximum shear stress in castellated beam section, with suitable free body diagram. **[8]**

P.T.O.

Q3) a) What are merits and demerits of Aluminum structural sections as compared to steel sections. **[9]**

b) Design aluminum section strut to carry axial compressive load of 150 kN. The effective length of strut is 2.3 meter. Assume factor of safety 2. **[16]**

SECTION - II

Q4) a) Draw structural types of transmission tower and microwave tower. Show all main structural components and accessories to be considered for design. **[10]**

b) Explain the effect of tension cable connected to transmission cable. What is the effect when cable suddenly brakes? How design forces are affected due to braking of cable. **[15]**

Q5) a) Sketch the typical details at connection of tubular truss members. Consider welded joint. **[8]**

b) What are the provisions in IS code for design of scaffolding using tubular structure. **[9]**

c) Write the merits and demerits of Tubular sections as structural memebers. **[8]**

Q6) a) Compare the load carrying capacity of channel section in flexure (of same dimensions, channel with depth of web 100mm, flange width 75 mm) and light gauge channel section 100 mm width of web and 75 mm width of flange, stiffened section ,lip width 12mm thickness of light gauge 1.5 mm. **[15]**

b) Compare and differentiate stiffened and unstiffened section. **[6]**

c) How light gauge section is manufactured? **[4]**