Total No. of Questions : 8]

SEAT No :

P 3890

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[5155]-139
M.E. (Civil - Structures)
ADVANCED DESIGN OF STEEL STRUCTURES (ADSS)
(2013 Course) (Semester-I)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer any five from eight questions.***
2) ***Figures to the right indicates full marks.***
3) ***Use IS - IS: 800-2007, IS: 800-1984, IS: 801, IS: 802, IS: 811, SP-34 and Nonprogrammable calculator.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***More reproduction from IS code as answer, will not be given full marks.***
6) ***Assume suitable data, if necessary.***

Q1) a) Explain which are different loads are coming on Hoarding Structures. **[3]**

b) The design factored forces coming in member of a hording structure are 200 KN tensile force, and 100 kN compressive force. Design a channel section back to back on opposite faces of 8 mm thick gusset plate with M20 black bolt of 4.6 grade of steel. Take length of member as 3m c/c. Draw the design sketch. **[7]**

Q2) a) List out the various assumptions made while designing castellated beams. **[3]**

b) Design a castellated beam in grade Fe410 steel to carry an imposed load of 4.5kN/m and dead load of 3kN/m over a simply supported span of 12m. Assume that the compression flange is fully restrained. **[7]**

Q3) a) List out the various forces acting on microwave towers. **[3]**

b) A 40m high microwave antenna lattice tower is to be built near pune the terrain at the site is nearly a level ground with terrain of category 1. The diameter of the hemispherical antenna disc, fixed at the top is 3m. The width of the tower at the top is 3m. Select a suitable configuration for the tower and determine maximum compressive fore and tension in the tower legs and also the maximum shear at the base, for the following data. **[7]**

Weight of antenna disc and fixtures: .5kN

Weight of paltform at the top: 1.0kN/m^2

Weight of railing at top: 0.5kN/m^2

Weight of ladder and the cage: 0.75kN/m

Weight of miscellaneous item: 2.5kN

Q4) A steel tower is to be erected for transmission line of a single circuit 3-phase 50cycles/sec, to transmit 40MWat 0.85 power factor for 200 km. Assuming Suitable data determine the maximum sag of the conductor at mid span. **[10]**

Q5) a) Write a short note on. **[4]**

i) List out the advantages of tabular members.

ii) Types of connections used in round tubes.

b) A tabular column hinged at one and roller support at other end has the outside diameter of the tube 150mm and is of heavy gauge (i.e @ 16.2 kg/m). The length of the column is 3.0m. Determine the safe load the column can carry if the column is of IS 1161 grade Yst 240 steel. **[6]**

Q6) a) What are the advantages and disadvantages of light-gauge sections and draw different forms of it. **[3]**

b) Find the column section properties and allowable load for the column section shown in Figure 1. The effective length of column is 3.0m. Take fy=235 MPa. **[7]**

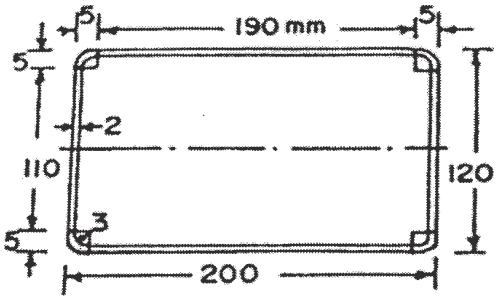

Figure 1

Q7) Design a self supporting lined chimney to the following particulars **[10]**

Height of the chimney = 70m.

Diameter of the chimney = 3.5m

Thickness of the lining = 120mm

Wind Pressure = 1250N/mm^2 on flat vertical surface.

Take safe tensile stress = 135 N/mm^2.

The foundation has to rest on medium soil having bearing capacity = 230 kN/m^2

Q8) A column section ISHB350@ 907.4 N/m is subjected to following factored loads. **[10]**

Axial compressive load, P = 450 kN

Moment, M = 85 kN.m

Assuming M25 grade of concrete for the pedestal and a square base plate, design the following

i) Thickness of base plate

ii) Anchor bolts.

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