Total No. of Questions : 8]

SEAT No. :

P3841

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M.E. (Civil-Structures)

ADVANCED DESIGN OF STEEL STRUCTURES

(2017 Credit Course) (Semester - I) (501003)

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

Instructions to the candidates:

1) ***Answer Q.1 or Q.2; Q.3 or Q.4; Q.5 or Q.6; and Q.7 or Q.8.***
2) ***Figures to the right indicate full marks.***
3) ***If necessary, assume suitable data and indicate clearly.***
4) ***Use of electronic pocket calculator and relevant IS codes are allowed.***

Q1) a) A 60m microwave tower is made up of four parts. The top 15m portion is straight and has a uniform width of 3.2m. The remaining 45m varies uniformly and has a bottom width of 6.6m. The total gravity load acting on the tower is 450 kN. Lateral loads of 25, 50, 100, 150 and 200 kN are acting at 7.5, 22.5, 37.5 and 52.5m respectively from the base of the tower. Determine the maximum compressive and tensile force in the legs at the base. **[6]**

b) Explain different types of hoarding structures with sketches. **[3]**

OR

Q2) a) Design a castellated beam of span 12m to carry an imposed load 4kN/m and dead load 2 kN/m. **[6]**

b) Highlight the advantages of tubular sections over conventional steel sections. **[3]**

Q3) a) Two channel sections with bent lips 180mm×80mm are connected with webs to act as a column. The thickness of channel section is 2.5mm. The depth of lips is 25mm. The effective length of column is 3.5m. Determine the service load it can carry. **[6]**

b) Explain with neat sketches the various types of transmission towers. **[3]**

OR

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Q4) a) Explain broken wire condition and uplift. **[6]**

b) What is local buckling? Explain with a suitable example. **[3]**

Q5) a) Explain how the height and other dimensions of a steel chimney are determined. **[8]**

b) Determine the diameter at top, diameter of flared portion, height of flared portion and design the plates for the steel chimney of 40m height. The chimney is located in Pune city. **[8]**

OR

Q6) a) A steel chimney of 60 m height is to be erected in Pune. Determine the diameter at top, diameter of flared portion, height of flared portion and design the plates for the steel chimney. **[8]**

b) What forces act on the base plate of steel chimney? Explain the design procedure of base plate. **[8]**

Q7) a) How is stability analysis carried out for a steel chimney? **[8]**

b) What is the function of base plate provided for the steel chimney? How is it analyzed and designed. **[8]**

OR

Q8) Explain step-by-step design procedure of base plate and anchor bolts for a steel chimney. **[16]**

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