



## GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **CE453A - (Elective-II)-Advanced Design of Steel Structures**

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Maximum Marks : **60**

Duration : **3 Hrs**

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**Answer Key Submission Type:** No marking scheme and solution

Instructions:

1. All questions are compulsory. **Assume suitable data if necessary**
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.
6. Use of IS 800-2007, IS-456 , IS- 875 and steel table is allowed.

- 1) a) Determine the expression for the thickness of base plate in chimney [4]  
**OR**  
 b) Give the advantages of tubular structures. [4]  
 c) What are the different components of gantry girder? Explain the loads acting on gantry girder [6]
- 2) a) Write note on design considerations as per I.S. code for tubular structure used as scaffolding [8]  
 b) What are the hoarding structures?.How dead load and wind load of hoarding structure is determined. [7]  
**OR**  
 c) A tubular column , hinged at both ends, has the outside diameter of tube 127mm and is of heavy gauge (i.e.@16.2 kg/m). The length of column is 3 m. Determine the safe load the column can carry if the column is of IS:1161 grade Yst 240 steel. [7]
- 3) A 38 m 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 hemi spherical antenna disc ,fixed at the top is 3 m.The width of the tower at the top has 3 m. Select a suitable configuration for the tower and determine maximum compressive force and tension in tower legs and also the maximum shear at the base, for the following data [15]  
 Weight of antenna disc and fixture 5 kN  
 Weight of platform at top 1.0 kN/m<sup>2</sup>  
 Weight of railing at top 0.50 kN/m<sup>2</sup>  
 Weight of ladder and the cage 0.75 kN/m  
 Weight of miscellaneous items 2.5 kN
- 4) A self supporting chimney is of effective height equal to 27 m having its diameter at top equal to 2 m. Design the chimney , taking a uniform wind pressure intensity of 1.5 kN/m<sup>2</sup> throughout the height. Assume uniform values of permissible tensile and compressive stresses as 120 N/mm<sup>2</sup> and 90 N/mm<sup>2</sup>. [20]

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