

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Winter 2018 - 19 Examination

Semester: 2
Subject Code: 03209181
Subject Name: Analysis Design of Tall Structures

Date: 14/12/2018
Time: 2:00 pm to 4:30 pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page. IS 875 Part 3 is allowed

- Q.1** A) Give the classification of industrial chimneys. (05)
 B) List types of energy dissipation devices for tall buildings. Explain any one in detail? (05)
 C) What is high rise building or Tall building? How do you differentiate tall building from medium rise buildings? (05)

- Q.2 Answer the following questions.** (Attempt any three) (Each five mark) (15)
 A) What are factors affecting design of tall structures?
 B) Explain shear wall frame interactions.
 C) What do you mean by tall buildings? Mention the name of five tall buildings in world along with type of structural system used.

- D) Explain in brief various tube structural systems used in Tall buildings along with their recent application. Explain in brief the outrigger system along with their recent application.
Q.3 A) Explain in brief various tube structural systems used in Tall buildings along with their recent applications also explain in brief the outrigger system along with their recent application (07)

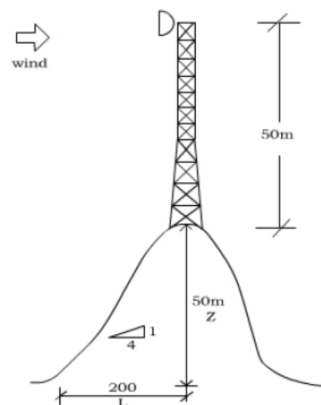
- B) Design a chimney of height 100 m and check the stresses at base in bars. Data given: (08)
 a) External diameter at top = 5 m
 b) External diameter at base = 6 m
 c) Shell thickness at top = 200 mm
 d) Shell thickness at base = 400 mm
 e) Wind Intensity = 1.5 kN/m² throughout
 f) Thickness of fire brick lining = 100 mm
 g) Air Gap = 100 mm
 h) Temperature difference = 75 °C
 i) Coefficient of thermal expansion = $11 \times 10^{-6} / ^\circ\text{C}$
 j) $E_s = 210 \times 10^3 \text{ N/mm}^2$
 k) Density of brick lining = 20 kN/m³
 l) M25 grade of concrete and Fe 415 grade steel.

OR

- B) Discuss the various checks to be carried out for stability analysis of foundation of a chimney. (08)
Q.4 A) What is a transmission Line tower? Classify Transmission Line Towers? (07)

OR

- A) A microwave tower of 50m height is proposed over a hill top. The height of the hill is 50m with a gradient of 1 in 4. The terrain category is 3. The tower is proposed at Coimbatore. Compute the design wind pressure:



- B) What is a cooling tower? Give the design steps of Hyperboloid Cooling Tower (08)