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Question Paper Code: 32965

M.E DEGREE EXAMINATION, NOVEMBER 2015

Elective

Structural Engineering

01PSE516 – DESIGN OF INDUSTRIAL STRUCTURES

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

(IS 456, IS 800 and steel tables are permitted, Assume any data requires suitably)

PART A - (10 x 2 = 20 Marks)

1. List the classification of industrial structures.
2. Briefly explain how ventilation can be planned in an industrial structure.
3. List the various types of roof trusses used in industries.
4. Design the parameters required for machine foundation.
5. List the various structural components involved in nuclear containment structures.
6. Describe the different types of Substation structures.
7. What are the loads likely to act on a transmission line tower?
8. Under what circumstances, testing of towers is necessary?
9. What is the range of thickness of firebrick lining and air gap provided in chimneys?
10. Distinguish between bunker and silo.

PART - B (5 x 14 = 70 Marks)

11. (a) General planning requirements regarding lighting, ventilation and fire safety of industrial buildings from factories act. (14)

Or

- (b) (i) How do you plan an industrial layout? (7)
(ii) How protection against vibration is achieved? (7)

12. (a) (i) Sketch the different steel roof trusses commonly used as industrial roofs. (7)
(ii) Write short notes on shell roofs. (7)

Or

- (b) Design a corbel to carry a factored load of 500KN at a distance of 200mm from the face of 300 X 300 mm column. Assume that grade M30 concrete is used for construction. (14)

13. (a) Explain in detail the various structural components involved in the construction of pressured heavy water nuclear reactor containment structure. (14)

Or

- (b) Explain in detail the different steps involved in the design of turbo generator foundations. (14)

14. (a) Write short notes on types of transmission line towers. (14)

Or

- (b) Explain briefly the type of foundation recommended for the below type of tower
(i) Self supporting towers (6)
(ii) Guyed towers (4)
(iii) Monopole (4)

15. (a) What are the various theories in the determination of horizontal pressure intensities in bunkers and silos? Explain any one of the theories. (14)

Or

- (b) A Concrete Chimney of height $80m$ with the external diameter of the shaft being $4m$ at top and $5m$ at bottom is required in a place where the wind intensity is $1.5KN/m^2$. Temperature difference between the inside and outside of shaft $=75^{\circ}C$. Design the base section of the chimney using $M25$ concrete and $Fe415$ steel. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) Explain the design procedure for gantry girder. (10)

Or

- (b) What is a Nib and under what situations would you use them? Sketch the reinforcement details in Nibs with (i) light loads (ii) large loads. (10)
