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Question Paper Code: 92063

M.E. DEGREE EXAMINATION, OCTOBER - 2014.

Elective

Structural Engineering

01PSE516 – DESIGN OF INDUSTRIAL STRUCTURES

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

(Relevant code book may be permitted)

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Mention the classification of industrial structures.
2. List out any two requirements for good lighting in industry.
3. List the types of roofs used in industrial building.
4. Write the use of corbel in industrial building.
5. Recall the factors to be considered in the design of generator foundation.
6. What is meant by containment building?
7. List the types of materials used in power transmission line.
8. Write a note on stability analysis of transmission tower foundation.
9. Mention the two types of cooling towers.
10. Reproduce the difference between a bunker and a silo.

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Reproduce the guidelines of Factories act. (7)
(ii) Explain the protection against noise and vibration in industrial structures. (7)

Or

- (b) (i) Reproduce the planning for layout requirements regarding ventilation in industry. (8)
(ii) Explain the fire safety plan in industry. (6)
12. (a) Design a gantry girder to be used in an industrial building carrying an electric overhead travelling crane, for the following data

Crane capacity = 250 kN

Self-weight of the crane girder excluding trolley = 250 kN

Self-weight of the trolley, electric motor, hook, etc. = 35 kN

Approximate minimum approach of the crane hook to the gantry girder = 1.2 m

Wheel base = 4 m

c/c distance between gantry rails = 16 m

c/c distance between columns (span of girder) = 8 m

Self-weight of rail section = 300 N/m

Yield stress of steel = 250 N/mm². (14)

Or

- (b) A factored load of 500 kN acting at a distance of 250 mm from the face of the column 300 mm x 400 mm. Design a corbel to support the load. Adopt M20 concrete and Fe 415 steel. (14)
13. (a) Explain the design procedure of turbo generator foundation. (14)

Or

- (b) Explain the types of nuclear containment structures. (14)
14. (a) (i) Describe the basic concept of transmission tower foundation. (8)
(ii) Discuss the use of testing towers. (6)

Or

(b) Explain the different types of power plant structures. (14)

15. (a) A self-supported steel stack is 80 m high and its diameter at the top is 3 m. Design the plants for the stack. Adopt the wind force as per IS 875. The location of place is such that the intensity of wind pressure up to 30 m height is 1.5 kN/m^2 . (14)

Or

(b) Enlighten the design procedure of concrete bunkers. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) With a neat sketch, reproduce the structural detailing of concrete silo. (10)

Or

(b) Explain the design principle and the application of cooling towers. (10)
