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Question Paper Code: 55U13

M.E. DEGREE EXAMINATION, MAY 2018

Elective

Structural Engineering

15PSE513 – DESIGN OF INDUSTRIAL STRUCTURES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. IS Code for industrial ventilation.

(a) IS : 3103 - 1975

(b) IS : 1646-1961

(c) IS : 3103 - 1977

(d) IS : 1646-1962

2. The Machine foundations are designed considering

(a) Dynamic Forces

(b) Kinematic Forces

(c) Static forces

(d) Both (b) and (c)

3. In thermal power plants the consider used is of

(a) surface type

(b) jet type

(c) Can both type and jet type

(d) NTPC

4. The type of cooling towers with maximum heat transfer from air to water is

(a) Natural Draft

(b) Mechanical Draft

(c) Electrical Draft

(d) Both (a)and (b)

5. The foundations are designed considering

(a) shocks and vibrations

(b) vibrations

(c) shocks

(d) neither a (or) b

PART B - (5 x 3 = 15 Marks)

6. Mention the sources of noise in Industries.
7. Sketch the reinforcements in nibs with large loads.
8. What are nuclear containment structures?
9. Write short notes on testing of towers.
10. What are the stresses subjected to RCC Chimney?

PART C - (5 x 16 = 80 Marks)

11. (a) Plan a layout for a cement industry which should satisfy all the requirements. (16)

Or

- (b) Explain about the classification of lightning? What are the points to be considered for providing natural lighting and ventilation. (16)

12. (a) Design a gantry girder for a yarn packing industry for the following data:

Crane capacity = 250 kN; Weight of crane (excluding crab) = 200 kN

Weight of crab girder = 50 kN; Mini. Hook approach = 1.2m

Wheel base distance = 3.5 m; C/C Spacing of Columns = 16 m

C/C Spacing of gantry rail = 16 m; Self-weight of rail section = 300 N/m

Depth of rail section = 75 mm; Take $f_y = 250 \text{ N/mm}^2$, $E = 2 \times 10^5 \text{ N/mm}^2$ (16)

Or

- (b) An industrial building is to be provided with a hand operated 50 kN crane facility. The details of the building and the gantry girders are: Longitudinal spacing of columns = 6m, Centre to centre distance of gantry girders = 12m, Wheel spacing = 3m, Edge distance = 1m, Weight of crane girder = 40 kN, Weight of trolley car = 10 kN. Design the gantry girder for bending and shear. (16)

13. (a) Draw the typical layout of nuclear power plant structures. (16)

Or

- (b) Explain about the construction methodologies and related aspects of power plant structures. (16)

14. (a) Under what circumstances testing of towers is necessary? (16)

Or

(b) Sketch the elevations of different types of transmission line towers. State the assumptions made in the analysis and discuss about the loading conditions to be considered in the design. (16)

15. (a) Enumerate the steps in the design of tower foundations and explain their salient features. (16)

Or

(b) Write a short note on Masts and Trestles. (16)
