Reg. No. :

Question Paper Code : 72165

28/04/18 FN

M.E./M.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Elective
Structural Engineering
ST7014 – INDUSTRIAL STRUCTURES
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What are the causes for fire in Industrial Buildings ?
2. How protection against noise can be done in industrial buildings ?
3. Why impact factor is considered in the computation of loads acting on gantry girder ?
4. Sketch the reinforcements in nibs with large loads.
5. What are the assumptions made in the design of silos by Janssen's theory ?
6. List the different types of power plant.
7. Write short notes on testing of towers.
8. What are the components of RCC Chimney ?
9. What type of foundation is adopted for towers ?
10. Define : Masts and Trestles.

PART – B (5×13=65 Marks)

11. a) State the important guidelines from Factories Act with reference to planning of industrial buildings.

(OR)

b) i) Mention the major components of an industrial building. (5)

ii) Explain about the classification of lightning. What are the points to be considered for providing natural lighting and ventilation ? (8)

12. a) Design a RCC corbel to carry a factored load of 500 kN at a distance 200 mm from the face of a 300 × 300 RCC Column. Use M35 concrete and Fe 415 steel.

(OR)

b) A Longitudinal type of a staircase spans a distance of 3.75 m c/c of beams. The flight consists of 15 steps. Take rise = 175 mm, tread is 250 mm. Assuming grade 25 concrete and Fe 415 steel, design the staircase for a live load of 5 kN/m^2. Assuming the breadth of the staircase as 1.4 m.

13. a) Discuss the design principle and procedure of cooling towers.

(OR)

b) Design a circular cylindrical bunker to store 25 tonnes of coal. Density of the coal is 9 kN/m^3. Angle of repose is 30°. Adopt M 20 concrete and Fe 425 steel.

14. a) i) Sketch the elevations of different types of transmission line towers. **(7)**

ii) Explain the design procedure of transmission line towers. **(6)**

(OR)

b) A self-supporting steel chimney is 60 m high and 3 m diameter at top. Design the thickness of plate required at 30 m and 60 m from top. Also design the base plate and the anchor bolts. Assume wind pressure as 1.5 kN/m^2.

15. a) Sketch and discuss in detail the various types of foundations used for towers and explain its design procedure.

(OR)

b) i) Explain in detail different types of machine foundation. **(7)**

ii) Explain the design procedure for turbo generator foundation. **(6)**

PART – C **(1×15=15 Marks)**

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

(OR)

b) Explain the gantry girder / crane girder design with machine foundation for industrial buildings.