

Roll No.

23521

**M. Tech 3rd Semester Civil Engg.
(Specialization in Structural
Design)**

Examination-May, 2015

Design of Structures-III

Paper-MTSD-301

Time : 3 hours

Max. Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** questions. All questions carry equal marks.

1. Design a bunker to store 400kN of coal, for the following data :

Unit weight of coal = 8340 N/m³;

Angle of repose = 30°.

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(1)

[Turn Over

The stored coal is to be surcharged at its angle of repose. Take permissible stress in the steel as 140N/mm^2 .

2. Design a chimney of 30 m height, having external diameter of 2.6 m throughout the height. The chimney has a fire brick lining of 100 mm thickness, provided upto a height of 24 m above the base, with an air gap of 100 mm. Assume the temperature of the gases above the surrounding air as 240°C . Take α for RCC as 11×10^{-6} per $^\circ\text{C}$ and $E_s = 2.05 \times 10^5 \text{ N/mm}^2$. Use M25 grade concrete. [20]
3. Explain all the methods used for calculating static pressure in detail. [20]
4. What are food irregularities ? Explain its effects in detail. [20]
5. Design a side wall to retain earth embankment 3 m high above the ground level. The unit weight of the earth is 18

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(2)

kN/m³ and its angle of repose is 30°. The embankment is horizontal at its top. The safe bearing capacity of soil may be taken as 100kN/m² and the coefficient of friction between soil and concrete as 0.5. Use M 30 mix and Fe 500 bars. [20]

6. Design a roof slab of a room measuring 5 m x 6 m size. The slab is simply supported on all the four edges, with corners held down and carries a superimposed load of 5000N/m² inclusive of floor finish. Use M25 mix and Fe 415 bars. [20]

7. What are the construction aspects that are considered for silos construction ? Explain all in detail with some examples. [20]

8. Explain the construction aspects of bunkers in detail. [20]