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/m^3;

Angle of repose = 30°.

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 °C and $E_s = 2.05 \times 10^5$ 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

kN/m^3 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/m^2 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/m^2 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]