Code: 13A01804 **R13**

B.Tech IV Year II Semester (R13) Regular & Supplementary Examinations April 2018

ADVANCED STRUCTURAL ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer all questions

All questions carry equal marks

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1 Design the typical interior panel of a flat slab floor of size 5 m x 5 m with suitable drop to support a live load of 4 kN/m^2. The floor is supported by columns of size 450 mm x 450 mm. Use M20 concrete and Fe415 steel. Sketch the reinforcement details by showing cross sections: (i) At column strip. (ii) At middle strip.

OR

2 Design the cylindrical walls and hopper bottom of a circular cylindrical bunker of capacity 300 kN to store coal using M20 concrete and Fe415 steel. Sketch the plan and cross-sectional elevation of the bunker showing the reinforcement details.

Given: Unit weight of coal is 8 kN/m^3

Angle of repose of coal (ø) = 25°

Coefficient of friction between coal and concrete (μ) = 0.444.

3 Design a circular tank with flexible base for the capacity of 2, 00,000 liters resting on the ground. The depth of water is to be 4 m, including a free board of 0.25 m. Use M20 concrete and Fe415 grade steel. Draw the plan and cross-sectional elevation of the tank showing the reinforcement details.

OR

4 Design a counter fort retaining wall to retain leveled soil of 5 m height over the ground level. The density of soil is 16 kN/m^3 and the angle of repose is 30°. The safe bearing capacity of soil is 160 kN/m^2. The spacing and thickness of counter forts are 3 m and 400 mm respectively. The base slab may be of 4.5 m wide and 400 mm thick. Depth of foundation is 1.2 m. Use M20 concrete and Fe415 steel. Sketch the reinforcement details.

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