

Hall Ticket Number :

--	--	--	--	--	--	--	--	--	--	--

R11/R13

Code: 1G682

IV B.Tech. II Semester Supplementary Examinations March 2019

Advanced Structural Engineering

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

Assume suitable data, if necessary

1. Design an interior panel of a flat slab with panel size 6 m × 6 m supported by columns of size 500 mm × 500 mm. Provide suitable drop. Take live load as 4 kN/m². Use M-20 concrete and Fe-415 steel. Sketch the reinforcement details.
2. Design a circular cylindrical bunker of capacity 300 kN to store coal using M20 concrete and Fe415 steel. Angle of repose 25, unit weight of coal is 8 kN/m³, coefficient of friction between coal and concrete is 0.444.
3. Design a R.C chimney of height 60 m and check the stresses. Diameter of chimney external 4.5 m and internal 4.0 m, air gap 100 mm, thickness of fire brick lining is 100 mm, temperature difference 75, coefficient of thermal expansion $11 \times 10^{-6}/^{\circ}\text{C}$
4. Design an Intz-type tank to hold 1.5 million litres of water. The height of tank above general ground level is 20 m. The site has a bearing capacity of soil = 250 kN/m². Use M-25 concrete and Fe-415 steel.
5. Design a rectangular water tank of size 6 m × 4 m × 3m deep resting on firm ground. Use M25 concrete and Fe415 steel.
6. Design a counterfort retaining wall if the height of wall above the ground level is 5.6m, SBC of soil = 180 kN/m, angle of friction $\phi = 30^{\circ}$ and unit weight of back fill = 16 kN/m. Keep spacing of counter forts as 3 m. Coefficient of friction between soil and concrete $\mu = 0.5$. Adopt M20 grade concrete mix and Fe415 steel.
7. A reinforced concrete grid floor is to be designed to cover a floor area of size 12 m × 6m. The spacing of the ribs in mutually perpendicular direction is 2 m C/C. Live load=1.5kN/m². Use M-20 concrete and Fe-415 steel. Analyze the grid floor for moments and shears by Rankine Grashoff method. Design the floor completely and sketch the reinforcement details.
8. A longitudinal type of stair case spans a distance of 3.75 m centre to centre of beams. The rise is 175 mm going 250 mm and tread 270 mm. The treads have 15 mm granolithic finish and consists of 15 steps. Live load is 5 kN/m. Design stair case. Assume M25 grade concrete and Fe415 steel. Breadth of stair case is 1.5 m.
