Code: 15A01802

R15

B.Tech IV Year II Semester (R15) Advanced Supplementary Examinations July 2019

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 an interior panel of a flat slab with panel size 5 x 5 m supported by columns 4.5 m x 4.5 m. Provide suitable drop. Take live load as 4 kN/m^2. Use M20 steel and Fe415 steel. Draw the reinforcement details by showing cross section at column strip.

OR

2 Design a chimney of height 60 m. Given external diameter – 4.0 m, shell thickness 300 mm, wind intensity 1.9 kN/m^2, thickness of fire brick lining – 100 mm, air Gap-100 mm, temperature difference - 80^0C, coefficient thermal expansion – 11 x $10^{-6}/^0$C, Es = 2.1 x 10^5 kN/mm^2, unit weight of brick lined – 20 kN/m^3. Use M25 concrete and Fe415 steel. Draw plan and sectional elevation.

3 Design a rectangular tank resting on ground with internal dimensions 7.0 x 5.5 x 2.75 m high. Take the free board as 300 mm. Use M25 grade concrete and HYSD steel of grade Fe415. Draw plan and sectional elevation.

OR

4 Design and detail the various elements of counter fort retaining wall to support difference in ground elevation of 9 m. The foundation depth may be taken as 1.5 m below ground level, with a safe bearing capacity of 160 kN/m^2. Assume a level backfill with a unit weight of 16 kN/m^3 and an angle of shearing resistance of 30^0. Assume a coefficient of friction, μ = 0.5, between soil and concrete. Draw plan and sectional elevation.

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