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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech IV Year II Semester Regular & Supplementary Examinations July-2021

ADVANCED STRUCTURAL DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 Design an interior panel of a flat slab 8 m x 8 m for a live load of 10 KN/m². Use M20 grade concrete and Fe415 steel respectively. L4 12M

OR

- 2 Design an interior panel of a flat slab with panel size 5 x 5 m supported by size of column is 500mm x 500mm. Without Provide suitable drop. Take live load as 4 KN/m². Take floor finishing load as 1KN/m² Use M20 steel and Fe415 steel. L4 12M

UNIT-II

- 3 Design a rectangular RC water tank resting on the ground with an open top for a capacity of 80,000 litres. The inside dimension of the tank may be taken as 6m x 4m. Design the side walls of the tank using M20 grade concrete and Fe 250 grade. L4 12M

OR

- 4 Design a circular water tank with flexible base for a capacity of 4 lakhs litres of water. The depth of tank may be kept 4m including a free board of 200mm. Use M20 concrete and Fe 415 steel. L4 12M

UNIT-III

- 5 Design the stem of a cantilever retaining wall to retain an earth embankment with a horizontal top 3.75 m above ground level. Density of earth = 19 KN/m³. Angle of internal friction $\phi = 30^\circ$. SBC of soil = 180 KN/m². Coefficient of internal friction between soil and concrete = 0.5. Design of stem and heel not required Adopt M20 grade concrete and Fe 415 grade steel. L4 12M

OR

- 6 Design a cantilever retaining wall to retain earth for a height of 3.5m. The density of soil is 18 KN/m³. Safe bearing capacity of soil is $(q_0) = 200$ KN/m². Take the coefficient of friction between concrete and soil as 0.5. The angle of repose is 30 degrees. Design of stem and heel not required. Use M20 concrete and Fe415 steel. L4 12M

UNIT-IV

- 7 Design a welded plate girder of span 24 m to carry a super imposed load of 35 KN/m. $f_u = 415$ MPa. using end stiffeners, but avoid intermediate stiffeners. Use Fe - 415 & (Fy250) grade steel. L4 12M

OR

- 8 A plate girder simply supported at a span of 24m consists of a web plate 1200 mm x 12 mm and a flange plate 440 mm x 36 mm for each flange. The girder carries an super imposed load of 35KN/m. using end stiffeners but avoid intermediate stiffeners. Use Fe - 415 &(Fy250) grade steel. L4 12M

UNIT-V

- 9 Determine the moment and forces due to the vertical and horizontal loads acting a simply supported gantry girder given the following data (i)Simply supported span =6m (ii)Cranes wheel centres=3.6 (iii)Self-weight of the girder=1.6KN/m (iv)Maximum crane wheel load=220KN/m (v)Weight of crab/trolley=60KN (vi)Maximum hook load=200KN Calculate also the serviceability deflection(working load). L4 12M

OR

- 10 Explain step by step procedure how to design a gantry girder as per IS code. L4 12M

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