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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- DEC- 2019

B.TECH 7th Sem/ M.Tech 1st Sem

COURSE CODE: 11M1WCE113

MAX. MARKS: 35

COURSE NAME: DESIGN OF REINFORCED CONCRETE STRUCTURES

COURSE CREDITS: 3

MAX. TIME: 2Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of IS 3370 (I to IV) and IS456:2000 are allowed.

Q1. Design a Cantilever retaining wall to retain a horizontal earthen embankment of height 4m above the ground level. Back fill density is 18kN/m^3 and angle of internal friction as 30° . Safe bearing capacity of soil is 200kN/m^2 . $M= 0.45$. Use M20/ Fe415. [CO4, 7]

Q2. How do you find the moment of resistance of a beam section? Derive expressions for the position of neutral axis and moment of resistance of balanced rectangular section. [CO1, 7]

Q3. Design a circular tank with flexible base for a capacity of 50000 liters. The depth of water is to be 5m, including a free board of 150mm. Use M20 and Fe415 [CO3, 7]

Q4. A reinforced concrete slab $5\text{m}\times 5\text{m}$ is simply supported along the four edges and is reinforced with 10mm dia Fe415 bars at 150mm c/c both ways. The average effective depth of the slab is 100mm and the overall depth of the slab is 130mm. The slab carries a flooring of 50mm thick having unit weight of 2.2kN/m^2 . Determine the maximum permissible service load as per yield line theory. Use M20 Concrete. [CO2, 7]

Q5. What are footings? How are they classified? Describe various steps in the design of square footings with uniform depth supporting a column with axial load only. [CO5, 7]