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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- DEC- 2018

B.Tech 7<sup>TH</sup> Sem/ M.Tech 1<sup>ST</sup> Sem

COURSE CODE: 11M1WCE113

MAX. MARKS: 35

COURSE NAME: Design of Reinforced concrete Structures

COURSE CREDITS: 3

MAX. TIME: 2 HRS

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*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume any suitable data if needed.*

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**Q1.** Deduce an equation to find the moment of resistance of a triangular section of base width  $B$  and total depth  $D$  with its apex at top. Use working stress method of design. [CO1,7]

**Q2.** Design a T shaped cantilever retaining wall to retain earth embankment 3m high above ground level. The unit weight of earth is  $18\text{kN/m}^3$  and its angle of repose is  $30^\circ$ . The embankment is horizontal at its top. The safe bearing capacity of soil may be taken as  $100\text{kN/m}^2$  and the coefficient of friction between soil and concrete as 0.5. Use M20/ Fe415. [CO4, 7]

**Q3.** 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  $2.2\text{kN/m}^2$ . Determine the maximum permissible service load as per yield line theory. Use M20 Concrete. [CO2, 5]

**Q4.** Design a circular water tank with flexible base for a capacity of 400000 liters. The depth of water is to be 4m, including a free board of 200mm. Use M20 concrete. [CO3, 7]

**Q5.** How foundations are classified? Explain in detail with figures. Tabulate the types of foundations as per their suitability. [CO5, 5]

**Q6.** What are different types of joints used in design of water tanks? Explain with appropriate figures. [CO3, 4]