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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID TERM (SUMMER SEMESTER EXAMINATION)- JUNE-2018

B.Tech VI Semester

COURSE CODE:10B11CE612 MAX. MARKS:50

COURSE NAME: Foundation Engineering

COURSE CREDITS: 04 MAX. TIME: 2 Hrs

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

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1. A retaining wall 6 m high supports earth with its face vertical. The earth is cohesionless with particle specific gravity 2.69, angle of internal friction 35° and void ratio of 0.68 The earth surface is horizontal and level with the top of the wall. Determine the total earth thrust and its line of action if the water table is 2.5 m below the ground surface. Also draw the pressure diagrams with defined pressure intensities at various levels. **[10]**

2. A 3.0 m side square footing is located in a dense soil at a depth of 2.0 m. Determine the ultimate bearing capacity for the following water table positions:
   (a) At ground surface (b) At footing level (c) At 1 m below the footing
   The moist unit weight of sand above the water table is 18 kN/m^3 and the saturated unit weight is 20 kN/m^3, ϕ=35°, c=0, N_q=33 and N_γ=34. **[15]**

3. State the assumptions behind Terzaghi's bearing capacity theory and derive the same clearly showing all the assumed forces. **[10]**

4. Explain the three principle modes of soil failure beneath the foundation with figure. Also describe the zones beneath the foundation as described by Terzaghi. **[10]**

5. Mention the drawbacks/limitations of SPT and CPT test. **[5]**