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Final Assessment Test – April 2019

Course: CLE1004 - Soil Mechanics and Foundation Engineering
Class NBR(s): 3548 Slot: D1+TD1
Time: Three Hours Max. Marks: 100

PART – A (10 X 2 = 20 Marks)
Answer ALL Questions

1. List out the technical reasons for the leaning of the PISA tower in Italy. Recommend a suitable technique for ensuring the stability of the structure.
2. How do you decide the depth of exploration? List the factors you will consider.
3. Derive the relation between the coefficient of volume change and coefficient of compressibility.
4. A sample of saturated sand has a dry unit weight of 17.85kN/m^3 and a specific gravity of 2.66. If unit weight of water is 10kN/m^3, compute the void ratio of the sample.
5. What are the modes of failure of shallow foundations?
6. Define Over consolidation ratio and preconsolidation pressure.
7. A clay layer 5m in thick in field takes 310 days to attain 50% consolidation with the condition of double drainage. If the same layer is underlain by hard rock, compute the time taken to attain 50% consolidation.
8. Under what situation, Rafts are preferred?
9. What is earth pressure at rest?
10. List various methods of minimising total and differential settlement.

PART – B (5 X 16 = 80 Marks)
Answer any FIVE Questions

11. a) A new building is planned upon the site as shown in fig.1. Assume that the clay solids have a specific gravity of 2.67. Find the primary consolidation settlement if the clay is normally consolidated. [8]

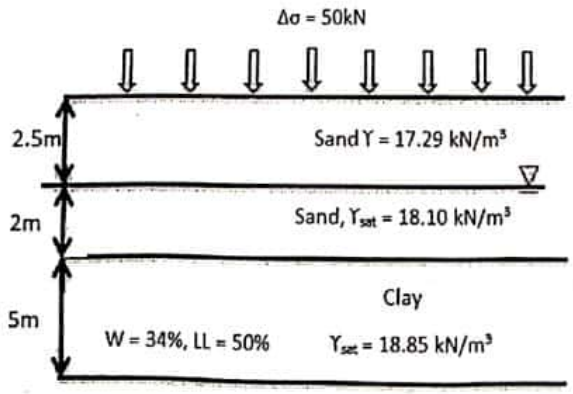

Figure.1

b) Laboratory tests on a 25mm thick clay specimen drained at the top and the bottom show that 50% consolidation takes place in 8.5minutes. (i) How long will it take for a similar clay layer in the field 3.2m thick, but drained at the top only, to undergo 50% consolidation? (ii) Find the time required for the clay layer in the field as described in (i), to reach a 65% consolidation. [8]