PVP 14

Code: CE5T6

III B.Tech - I Semester – Regular/Supplementary Examinations
March - 2021

GEOTECHNICAL ENGINEERING - II
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11x 2 = 22 M

1.

a) What is sub-soil exploration and state the importance of it in civil engineering projects.
b) A sampler of length 760 mm, diameter 50 mm and wall thickness of 7.5 mm. Mention two soil properties that can be reliably determined from these samples.
c) State the differences between the Rankine's and Coulomb's earth pressure theories.
d) Define critical circle of a slope with a neat sketch.
e) Draw different types of retaining walls with their salient details.
f) State IS-Code recommendations for Bearing capacity.
g) Differentiate shallow and deep foundations.
h) Mention the two soil properties essential for calculation of elastic settlements.
i) Explain any one method to reduce the differential settlements.

j) Draw typical pile load test and list their salient features.

k) Sketch the different shapes of well foundation.

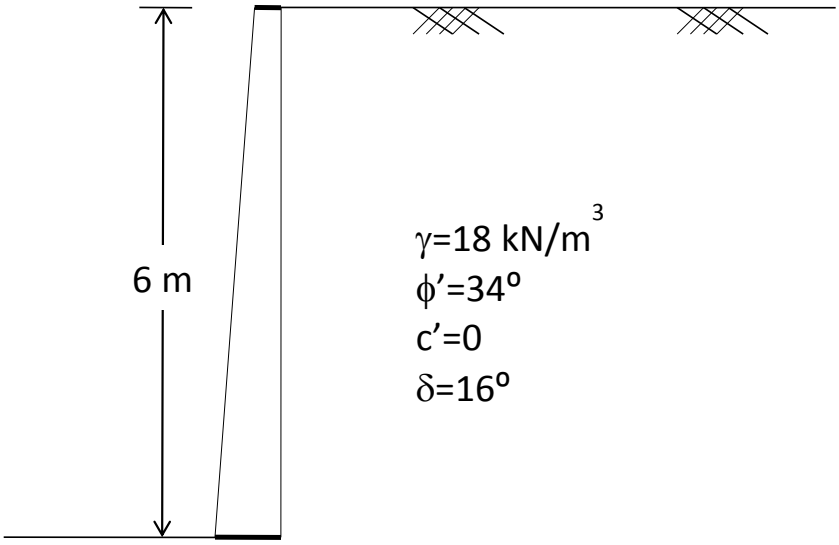
PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Explain Standard Penetration Test. List out various corrections for field measured N. What are the correlations for shear strength parameters? 10 M

b) Estimate the active force on the retaining wall shown below, using the Culmann's graphical approach. 6 M



3. a) Explain the stability of retaining walls with neat sketch. 8 M

b) What is slope and discuss any two slope stability analysis methods with assumptions and neat sketch? 8 M

4. a) State the assumptions made in the derivation Terzaghi's bearing capacity and also list out different terminology in bearing capacity. 7 M

b) Determine the ultimate bearing capacity of a strip footing 2m wide, base at a depth of 1.5m, resting on a dry sand stratum, if the ground water table is located at

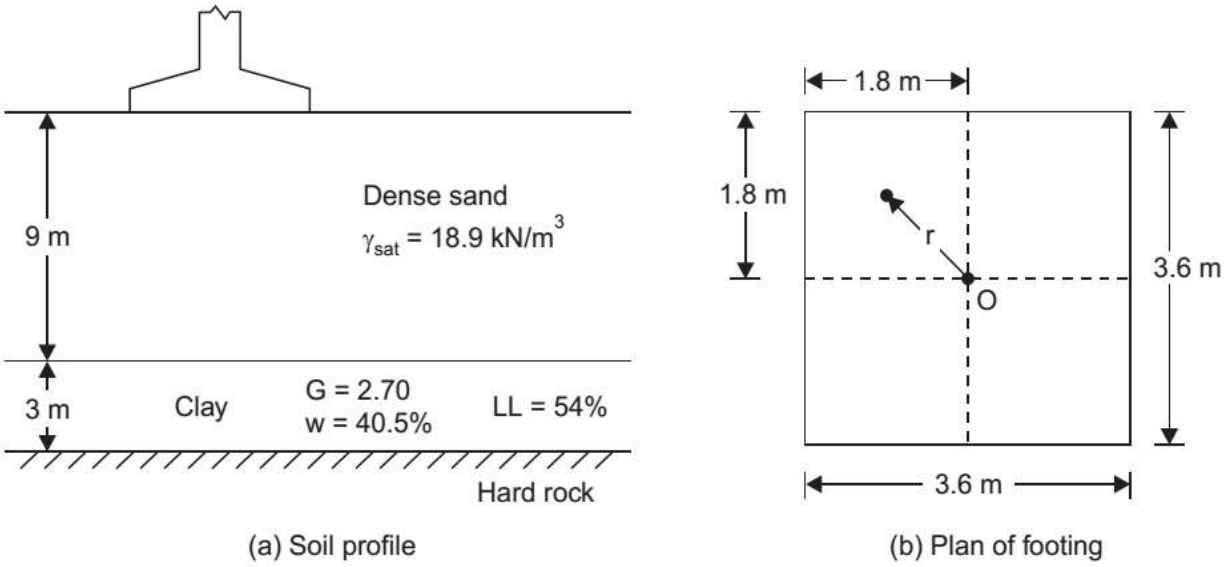
i. a depth of 1m below the ground surface

ii. a depth of 0.5m below the base of the footing

Consider Y_d= 18.3 kN/m^3, ϕ = 36°, C = 0, Y_{sat}= 19.7 kN/m^3. Use Terzaghi theory (N_c =50, N_q = 65 & N_Y = 80). 9 M

5. a) Explain measures for reducing the settlements and also state what are the different methods available for the quantifying the settlements. 8 M

b) A footing foundation for a water tower carries a load of 15000 kN and is 3.6metres square. It rests on dense sand of 9m thickness overlying a clay layer of 3 meters depth as shown in figure. The clay layer overlies hard rock. Liquid limit of clay is 54%, water content 40.5%, and grain specific gravity is 2.70. The saturated unit weight of dense sand is 18.9 kN/m^3. Estimate the ultimate settlement due to consolidation of the clay layer, assuming the site to be flooded. 8 M



(a) Soil profile (b) Plan of footing

6. a) Explain any four methods to determine pile load carrying Capacity. 8 M

b) Briefly explain different types of wells with neat sketch. 8 M