Code: CE5T6

III B.Tech - I Semester – Regular/Supplementary Examinations
October 2017

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) List the field tests commonly used in subsurface investigation.

b) How is the data from dynamic cone penetration test useful?

c) What is the earth pressure test? When it is likely to develop behind a retaining structure?

d) Why retaining walls are usually designed for active earth pressure?

e) Compare the Rankine's theory with the coulomb theory in respect of (i) backfill surface and (ii) the geometry and characteristics of the back of the wall.

f) What is meant by an infinite slope? What is the criterion for the stability of an infinite slope in sand?

g) List the factors affecting the factor of safety of an infinite slope in a clay soil.

h) What is the difference between the 'total stress' and the 'effective stress' methods of stability analysis?

i) What is the Taylor's 'stability number'? How do you use the stability chart?

j) What is negative skin friction?

k) What are the different circumstances under which a pile foundation is used?

PART – B

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

$$3 \times 16 = 48 \text{ M}$$

2.a) Explain briefly different methods of boring.   8 M

b) Explain briefly Static Cone Penetration Test.   8 M

3.a) A smooth vertical wall, 4 m high, retains a soil with $\gamma = 18$ kN/m^2 and c' =25 kN/ m^2. The horizontal backfill surface carries a uniform surcharge load 50 kN/ m^2. If the retaining wall is caused to move towards the soil sufficiently to mobilize the passive resistance, draw the pressure distribution diagram. Determine the magnitude and the point of application of the total passive pressure.   10 M

b) Explain Friction circle method.   6 M

4.a) Explain the types of foundations and their applicability.

6 M

b) Determine the ultimate bearing capacity of a strip footing, 1.5 m wide, with its base at a depth on a dry sand stratum. Dry unit weight is 17 kN/m^3 and coefficient of friction angle 38^0 and cohesion is zero. Use Terzaghi's theory. If the footing resting on a sand stratum with friction angel 32^0, determine the ultimate load carrying capacity using Terzaghi's theory, assume necessary data.   10 M

5.a) Explain clearly the impact of differential settlements on shallow foundations.   8 M

b) Briefly explain the soil in-situ tests.   8 M

6.a) Briefly explain the types of wells with neat sketches.

6 M

b) A 15 m long RCC Pile is installed in a deposit of uniform sand. The pile head is subjected to a horizontal force of 30 kN. Assuming the coefficient of subgrade modulus is 10×10^6 N/m^3 (1.0 kg/cm^3). Calculate the deflection of the pile head. What will be the change in deflection, if the pile head is fixed, assume EI of the pile as 3.7×10^7 N/m^2 (3.7×10^{10} kg/cm^2).   10 M