PVP 14

Code: CE5T6

III B.Tech - I Semester – Regular Examinations – December 2016

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) Define area ratio and outside clearance.
b) What are type of soil samples?
c) What is earth pressure at rest?
d) Write the revised Mohr's-coulombs equation for the shear strength of soil.
e) What are the different types of retaining walls?
f) Write the Taylors stability number.
g) Define the net and gross bearing capacity.
h) Draw a load-settlement curve for a general shear failure.
i) Define dynamic formulae of Danish.
j) List the different shapes of well foundation.
k) What are friction piles?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) What is standard penetration number? Explain the procedure for determining it in the field. Mention the corrections to be applied to the observed values of standard penetration number. 9 M

b) A 5m high masonry retaining wall has to retain a back fill of sandy soil having a unit weight of 18.2kN/m^3 and an angle of internal friction of 32^0. The surface of the backfill is inclined upwards at 10^0 to the horizontal. Determine the magnitude and point of application of the resultant active thrust on the wall. Also determine the horizontal and vertical component of the active thrust. 7 M

3. a) Describe the Culmann's graphical method of determining the active earth pressure in cohesion less soils. 9 M

b) A retaining wall with smooth vertical back is 8m high and retains a two layer sand back fill. The top layer is 3m high having $Ø=30^0$ and $\Upsilon=20$ kN/m^3. The bottom layer is 5m having $Ø=35^0$ and $\Upsilon=22$ kN/m^3. Determine the total active earth pressure and point of its application. 7 M

4. a) Differentiate between general shear failure and local shear Failure. 9 M

b) A square footing of 1.8m size is placed over a sand of bulk density 20 kN/m^3 and saturated density $22kN/m^3$ at a depth of 1.0m below ground. The angle of internal friction of sand is 30^0. The Terzaghi's bearing capacity factors N_c=30.14, N_q=18.4 and N_γ=15.1. Determine the ultimate bearing capacity of the soil when there is no effect of water table and when the water table is at base? 7 M

5. a) Explain the settlement of foundation on cohesion less soils? 9 M

b) A rectangular footing 3mX2m exerts pressure of $100kN/m^2$ on cohesive soils ($Es=5X10^4kN/m^2$ and μ=0.50). Determine the immediate settlement at the centre; assuring
i) the footing is flexible
ii) the footing is rigid. Take I=1.36?
7 M

6. a) Discuss the construction aspects of well foundations. 9 M

b) A group of piles with 3 piles in a row were driven into soft clay extending from ground level to a great depth. The diameter and the length of the piles were 30cm and 10cm respectively. The UCS of the clay is 70 KPa. If the piles

were placed at 90cm centre to centre. Compute the allowable load on the pile group on the basis of shear failure criteria for a factor of safety of 2.5? 7 M