

Unit 7 - Week 5

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Assignment Solution

Assignment 5

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-09-04, 23:59 IST.

 1) Using Meyerhof's method (1974), determine the net allowable bearing pressure (q_{a-net}) for the isolated footing of width 3.5 m is founded at a depth of 1.5 m below the ground surface. The water table is 1.5 m below the foundation level. The corrected average SPT value $N = 24$, and allowable settlement (S_a) = 40 mm. 1 point

- a) 402.98 kN/m²
 b) 412.81 kN/m²
 c) 434.76 kN/m²
 d) 456.78 kN/m²

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

 2) Determine the net allowable bearing pressure (q_{a-net}) for the footing in Q. 1 using Peck, Hansen and Thornburn (1974) procedure 1 point

- a) 33.8 t/m²
 b) 43.6 t/m²
 c) 51.2 t/m²
 d) 53.3 t/m²

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

 3) If two columns of a RCC structure are 8 m apart, the maximum differential settlement between columns should not exceed _____ mm in case of isolated foundation on sandy soil (as per IS: 1904-1978) 1 point

- a) 8 mm
 b) 10 mm
 c) 12 mm
 d) 15mm

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

 4) Using Teng's (1962) correlation, determine the net ultimate (q_{nu}) bearing capacity of a strip footing of width 3.75m resting on sandy soil. The corrected N values (SPT) of the soil at different depths are as follows: 1 point

- Elevation (m): -1.5, -2.25, -3.0, -3.75, -4.5, -5.25, -6.0, -6.75, -7.5, -8.25, -9
 Corrected N Value (SPT): 11, 22, 26, 28, 31, 33, 35, 37, 40, 42, 44
 The water table is located at a depth of 2.75m below the ground surface. The depth of foundation is 1.5m below the ground surface. The water table correction factors $R_w=1$ and $R_w'=0.65$. Note: ($q_{nu} = \frac{1}{6} [3N^2 BR_w' + 5(100 + N^2) D_f R_w]$)

- a) 1668 kN/m²
 b) 1560 kN/m²
 c) 1890 kN/m²
 d) 1990 kN/m²

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

 5) A raft foundation of dimensions 8 m x 12 m is placed on layered clayey soil. The raft is placed at a depth of 2m below the ground surface. The raft is subjected to a total load of 8000 kN. The foundation soil bed has three layers. The properties of the clay layers are: 1 point

- Layer I: from +0m to -4m, $\gamma_{sat} = 17.5$ kN/m³ and $\gamma_{bulk} = 16.5$ kN/m³, $C_c = 0.15$, $c_u = 25$ kN/m², $e_0 = 0.81$, $\gamma_w = 10$ kN/m³.
 Layer II: from -4m to -11m, $\gamma_{sat} = 18$ kN/m³ and $\gamma_{bulk} = 17$ kN/m³, $C_c = 0.12$, $c_u = 35$ kN/m², $e_0 = 0.7$, $\gamma_w = 10$ kN/m³.
 Layer III: from -11m to -20m, $\gamma_{sat} = 20$ kN/m³ and $\gamma_{bulk} = 18$ kN/m³, $C_c = 0.10$, $c_u = 50$ kN/m², $e_0 = 0.6$, $\gamma_w = 10$ kN/m³.

- The water table is at a depth of 1.5 m below the ground surface. Using Skempton's bearing capacity equation, determine the applied factor of safety in terms of bearing capacity.

- a) 5.24
 b) 3.1
 c) 4.23
 d) 2.32

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

 6) Determine the consolidation settlement of the raft of Question 5 after applying all possible correction factors. The pore water and depth correction factor is 0.70 and 0.96, respectively (neglect the immediate settlement). 1 point

- a) 97.3 mm
 b) 181 mm
 c) 150.3 mm
 d) 110.7 mm

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

 7) The maximum settlement of isolated footing which is founded on hard clay is (as per IS: 1904-1978) 1 point

- a) 60 mm
 b) 75 mm
 c) 50 mm
 d) 100 mm

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

 8) Match the following: [Correct Matching] 1 point

- List-I
 i. Strip footing
 ii. Isolated footing
 iii. Combined footing
 iv. Raft footing

- List-II
 A. Provided for load bearing wall
 B. Large slab supporting number of columns and walls under the entire structures
 C. Provided to support an individual column
 D. Provided to support more than one column

- a) i-B, ii-D, iii-A, iv-C
 b) i-A, ii-C, iii-B, iv-D
 c) i-B, ii-D, iii-A, iv-C
 d) i-A, ii-C, iii-D, iv-B

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

 9) The changes that take place during the process of consolidation of a saturated clay would include 1 point

- a) A decrease in pore water pressure and increase in effective pressure
 b) An increase in pore water pressure and decrease in effective pressure
 c) An increase in pore water pressure and increase in effective pressure
 d) A decrease in pore water pressure and decrease in effective pressure

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

 10) Rigidity correction factor for raft foundation 1 point

- a) 1.5
 b) 1.1
 c) 0.8
 d) 1.0

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c