8E8095

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B.Tech. VIII Semester (Main/Back) Examination, April/May - 2017
Civil Engineering
8CE4.2A Advance Foundation Engineering

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. IS : 8009 *2) IS : 2911*

Unit-I

1. A strip footing of width 3m is founded at a depth of 2m below the ground surface in a (C–ϕ) soil having a cohesion C = 30kN/m^2 and angle of shearing resistance $\phi = 35°$. The water table is at a depth of 5m below ground level. The moist weight of soil above the water table is 17.25 kN/m^3. Determine : **(16)**

a) The ultimate bearing capacity of soil,

b) The net bearing capacity,

c) The net allowable bearing pressure and the load/m for a factor of safety of 3. Use the local shear failure theory of Terzaghi's

Given data $\overline{Nc} = 25.2, \overline{Nq} = 12.7, \overline{Nr} = 9.7$

(OR)

1. Derive Terzaghi's bearing capacity equation. Write the assumptions and limitations of this equation. **(16)**

Unit-II

2. Describe Schemartman's, Dee Beer's and Mortin method of finding out settlement from static cone penetration test. **(16)**

(OR)

2. A 2m×2m footing carrying a load of 1600kN rests on a normally consolidated saturated clay layer 10m thick below which hard rock exists. The life span of the structure is 150 years. Time taken for the completion of primary consolidation of 20mm thick laboratory specimen with double drainage facility is 20 minutes. Find the total settlement, if the soil properties are as follows. Soil modulus 20 MPa, Poisson's ratio 0.45, influence factor 0.9, liquid limit 50%, Natural water content 25%, specific gravity of grains 2.7, saturated density 20kN/m^3 and coefficient of secondary compression 0.001. **(16)**

Unit-III

3. Define the following terms (any four) : **(4+4+4+4=16)**
   a) Frank, piles,
   b) Bored piles,
   c) Pressure piles,
   d) Bamboo piles,
   e) Negative skin friction.

(OR)

3. a) What will be the penetration of square R.C. pile per below which must be obtained in driving the pile with a 5 tonnes drop hammer falling through 1.2 metre. Allowable load is 30 tonnes.
   b) Define the Engineering News formula. **(12+4=16)**

Unit-IV

4. Draw and define the single under reamed pile and multi-under-reamed pile. **(16)**

(OR)

4. Define the following terms (any four) : **(4+4+4+4=16)**
   a) Soil exploration,
   b) Depth of water table,
   c) Chemical properties of soil,
   d) Elastic displacement,
   e) Settlement of pile groups,
   f) Efficiency of pile groups

Unit-V

5. Explain in detail bearing capacity of Mat foundation. **(16)**

(OR)

5. Describe the conventional Rigid method for designed of Raft foundation. **(16)**