Total No. of Questions : 8] *[Total No. of Printed Pages :2*

Roll No .....

MVCT/MVCP-302(B)

M.E./M.Tech., III Semester

Examination, December 2016

Advanced Foundation Engineering

(Elective-II)

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.
ii) Each question carry equal marks.

1. a) Explain Terzaghi's theory of bearing capacity of foundation on homogeneous soil and compare it with Meyerhof theory.
   b) Determine the ultimate bearing capacity of a strip footing 2m in width with its base at a depth of 1.5m below ground surface and resting on a saturated clay soil with the following properties :
   γ_{sat} = 20 kN/m^3, undrain cohesion = 40 kN/m^2, undrained angle of internal friction ϕ = 0°, drained cohesion = 10 kN/m^2, drained angle of internal friction = 23°. The natural water table is at 1m depth below ground level. Ignore depth factor.

2. a) Write the procedure for conducting pile load test in the field. How you calculate the ultimate failure load for a pile?
   b) A group of 9 piles arranged in a square pattern with diameter and length of each pile as 25cm and 10m respectively, is used as foundation in soft clay deposit. Taking the unconfined compressive strength of clay as 120kN/m^2 and the pile spacing as 100cm c/c. Find the load capacity of the group. Assume the bearing capacity factor N_c = 9 and adhesion factor = 0.75. The factor of safety of 2.5 may be taken.

3. a) What is eccentric footing? Write the various steps of design.
   b) Write and discuss the settlement of pile group in clay.

4. a) What are the advantages and disadvantages of using geogrids for soil reinforcement in comparison to steel strip for reinforced earth wall?
   b) Describe in details the characteristics, functions and use of geosynthetics in ground improvement.

5. Discuss the forces acting on a well foundation. Write various parameters for analysis of well foundation.

6. a) Write various elements of bridge substructure and describe each in details.
   b) Discuss the use of geosynthetics in embankment improvement for a highway project.

7. What is breakwater? Write in details about the design criteria for construction of a break water in sea.

8. Write short note on (any four) :
   a) Proportioning of footing
   b) Pile group action
   c) Reinforced earth
   d) Types of well
   e) Gravity wall

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