Total No. of Questions : 8] *[Total No. of Printed Pages : 3*

Roll No .....

MVSE-301(B)

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

Examination, December 2017

Advance Foundation Engg.

(Elective-I)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume suitable data wherever necessary.

1. Differentiate between: 4×3½
   a) Undisturbed sample and representative sample
   b) Area ratio and recovery ratio.
   c) Core recovery and rock quality designation
   d) Direct and Indirect methods of exploration.

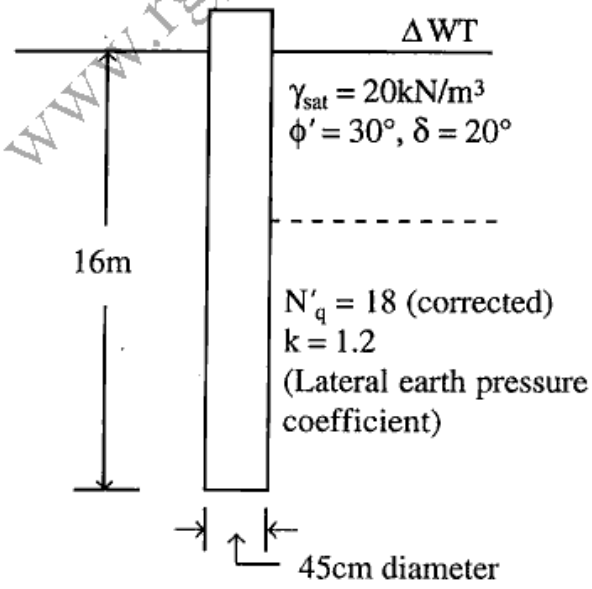
2. a) What are geophysical methods? Explain any one method in detail. 8
   b) How bearing capacity of soil is determined using SPT data? 6

3. a) What are the factors influencing the bearing capacity of a footing on a Cohesive and Cohesionless soil. 6

   b) A square footing is to be Constructed at a depth of 4m below ground level, on a sandy clay for which the cohesion is 50kN/m^2 and bulk density is 17kN/m^3. The total load applied to the soil is 5000kN and it is uniformly distributed. Find out the size of footing using Terzaghi equation. Use factor of safety as 3.0
   (Take N_c=10, N_q=4, N_r=2) 8

4. a) What is the difference between safe bearing capacity and allowable bearing pressure? Which is used in design? 6
   b) A (5×5) square pile group of circular piles is to be used as a foundation for a column in a highly cohesive clay ($\phi_u = 0$) Determine the optimum value. 8

5. a) Describe load test on piles? How pile load capacity is determined Using data of load test? 6
   b) For a pile driven in a saturated loose sand shown in figure below , estimate the ultimate load carrying capacity using static equations. 8



6. a) Describe different types of cofferdams. What are their relative merits and demerits? 6

   b) What are the design criteria for cellular cofferdam? 8

7. a) What are the requirements of a foundation subjected to dynamic loads? 6

   b) A machine weighing 500kN is mounted on a concrete foundation block resting on a soil layer. The area of the foundation block is $25m^2$ and its weight is 1000kN assume that the system is subjected to central vertical linear free vibration, the coefficient of elastic uniform compression is 11×10^4 kN/m^3.

      i) Calculate the natural frequency of the system

      ii) What will be the natural frequency of the system it weights are kept constant and Foundation area is doubled 8

8. Write short notes on any FOUR of the following : 4×3½

   a) Boring Records (Bore logs)

   b) Bearing capacity of stratified Soils.

   c) Modulus of sub grade reaction and its use.

   d) Negative skin friction on piles.

   e) Degree of freedom with Examples.

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