No. of Printed Pages : 2

ET-501(B)

B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

00583

December, 2018

ET-501(B) : FOUNDATION ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. Assume any missing data, if required. Use of scientific calculator is permitted.*

1. (a) Explain with a neat sketch the Resistivity method of soil exploration. *10*

(b) Distinguish between thin-wall and thick-wall samplers. *4*

2. A square footing located at a depth of 1·5 m from the ground surface carries a column load of 150 kN. The soil is cohesionless, submerged having an effective unit weight of 11 kN/m^3 and an angle of shear resistance of 30°. Find the size of footing using Terzaghi's theory, if $F_s = 3$, for $\phi = 30°$, $N_q = 10$ and $N_r = 6·0$. *14*

3. (a) Explain various causes of failure of earth retaining structures. *7*

(b) Write the utility of an under-reamed pile foundation. Discuss how bulbs of such a foundation function. *7*

4. (a) What is efficiency of a pile group ? How do you find the load carrying capacity of a pile group ? *10*

(b) What are different types of settlements ? *4*

5. A retaining wall 6 m high supports earth with its face vertical. The earth is cohesionless with particle specific gravity 2·69, angle of internal friction 35° and porosity 40·5%. The earth surface is horizontal and level with the top of the wall. Determine the earth thrust and its line of action on the wall if the earth is water-logged to level 2·5 m below the top surface. Neglect wall friction. Draw the pressure diagrams. *14*

6. Design a square pile group to carry 400 kN in clay with an unconfined compression strength of 60 kN/m^2. The piles are 300 mm diameter and 6 m long. Adhesion factor may be taken as 0·6. *14*

7. Write short notes on the following : *2×7=14*

(a) Negative Skin Friction

(b) Modes of Failure in Shallow Foundations
