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ET-501(B)

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

Term-End Examination

00690

June, 2015

ET-501(B) : FOUNDATION ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. Assume any required data, if missing.*

1. (a) Describe the Standard penetration test conducted in the field. How does it indicate the bearing capacity of soil ? 7

(b) What do you understand by Index properties of soil ? Briefly explain the procedure of determination of any one of these. 7

2. (a) How can settlements in buildings be controlled ? Explain briefly with neat sketches. 7

(b) A soil profile is shown in Figure 1. Calculate the settlement due to primary consolidation for 6 m clay layer due to a surcharge of 100 kN/m^2. Ground water is up to the top level of clay layer. 7

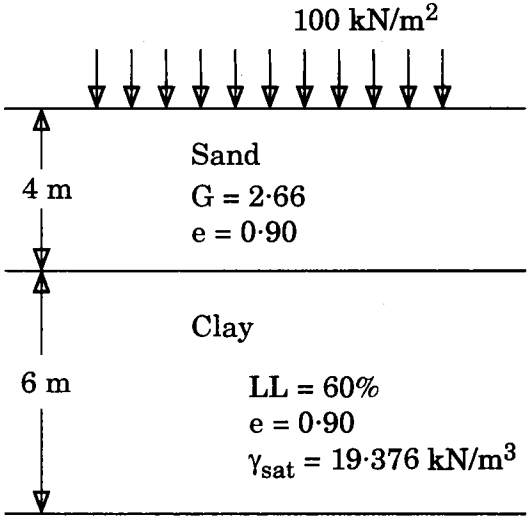

Figure 1

3. (a) Explain the differences between shallow and deep foundation with the help of neat sketches. 7

(b) Explain the procedure of pile driving in the field. 7

4. (a) Determine the safe load on a rectangular footing, 3 m × 2 m in size to be founded at a depth of 1·5 m from ground level. The factor of safety is 3 with respect to shear failure. The unit weight of soil is 18 kN/m^3. The relevant shear parameters are $c' = 25$ kN/m^2 and $\phi' = 22°$. The water table is at a depth of 2 m below the ground surface. For $\phi' = 22°$ take $N_c = 17{\cdot}2$, $N_\gamma = 7{\cdot}6$ and $N_q = 8{\cdot}10$. Value of w′ may be taken as 0·625. 7

(b) Explain why a large area of foundation is needed for a heavy column even if it is made of steel. 7

5. (a) What do you understand by eccentrically loaded footings ? What may be the effect of eccentricity of load on the stress pattern below the footing ? 7

(b) Discuss the advantages and disadvantages of Pneumatic Well foundation and Box Type (floating) Well foundation. 7

6. (a) Explain when a raft foundation is provided. 7

(b) What do you understand by a retaining wall ? Write the names of various types of retaining walls and draw a neat sketch of any one type. 7

7. (a) Differentiate between active earth pressure and passive earth pressure. 7

(b) What are creep settlements ? In which types of soils are these expected to occur ? Briefly describe a method to determine them. 7

8. Write short notes an any ***two*** of the following topics : *2×7=14*

(a) Coulomb's Theory

(b) Penetration Resistance Test

(c) Skin Friction