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ET-501(B)

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

Term-End Examination

June, 2011

ET-501(B) : FOUNDATION ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **all** questions. Use of calculator is permitted. Assume reasonable values for missing data, if any. Illustrate your answers with neat sketches.*

1. Answer ***any four*** of the following **4x10=40**

(a) Derive Bearing Capacity equation developed by Terzaghi, with neat sketches. Also mention the assumptions made and the limitations of the equation.

(b) A square footing is to carry a net load of 1200 kN. Determine the size of footing if the foundation is at a depth of 2 m and the tolerable settlement is 40 mm. The soil below the foundation is sand with N = 12. Assume factor of safety = 3, and water table to be very deep. Use Teng's equations.

(c) Briefly discuss

(i) Different types of samplers

(ii) Determination of depth and extent of soil exploration.

(d) What are different types of settlements. Explain one formula for finding each one of them.

(e) A clay layer 24 m thick has a saturated unit weight of 18 kN/m^3. Ground water level occurs at a depth of 4 m. It is proposed to construct a reinforced concrete foundation, length 48 m and width = 12 m, on the top of the layer, transmitting a uniform pressure of 180 kN/m^2. Determine the settlement under its centre. Modulus of elasticity (E) for the clay is 33 MN/m^2 obtained from triaxial tests. Initial voids ratio = 0.69. Change in void ratio = 0.02. (Given $I_n = 0.48$ for $\frac{L}{B} = 4$ and $\frac{H}{B} = 4$, $V = 0.5$ and rigidity factor R = 0.8)

(f) Discuss the factors affecting Bearing Capacity.

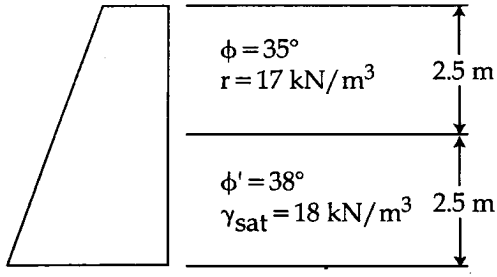
2. Answer ***any three*** of the following : **3x10=30**

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

(b) Explain any four methods of foundation practices adopted in expansive soils (other than under reamed piles)

(c) Explain coulombs theory for finding active earth pressure in a cohesionless soil.

(d) Determine the active earth pressure on the retaining wall shown in fig.



(e) Discuss the methods of isolating vibrations arising from machine foundations from the surroundings.