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B.E. SEMESTER-VI EXAMINATION APRIL/MAY -2015

Subject Code: CV503
Date: 08/05/2015

Subject Name: Geotechnical Engineering-2
TIME: 10:30AM To 1:30PM

Total marks: 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific calculator is permitted.
3. All questions are compulsory.
4. Indicate clearly the options you attempted along with its respective question number
5. Use the last page of supplementary for rough work.

Section-1

- Q.1 (A) Elaborate the word footing. Explain the factors that effect the selection of type of foundation. 05
- (B) Explain in detail "Under Reamed Pile Foundation". 05
- (C) What is the basis on which the dynamic formulae are derived? Mention two well known dynamic formulae and explain the symbols involved. 05
- OR
- (C) Write about piles accordingly to method of installation and their load carrying characteristics. 05
- Q.2 Answer the following Questions.
- (A) Describe "Negative skin friction". 05
- (B) A 12m long 300mm diameter pile is driven in a uniform deposit of sand ($\Phi = 40^\circ$). The water table is at a great depth and is not likely to rise. The average dry unit weight of sand is 18 kN/m^3 . Using $N_q = 135$ calculate the safe load capacity of the pile with factor of safety as 2.5. 05
- OR
- Q.2 (A) Write short note on "New-mark's Influence Chart". 05
- (B) A pile is driven with a single acting steam hammer of weight 30 kN with a free fall of 1.2 m. The average penetration of the last 20 blows is 25mm. Find the safe load using the ENR formula. 05
- Q.3 Answer the following Questions.
- (A) Differentiate between the following. 05
- (i) Strip footing and strap footing.
- (B) An over head water tank with a weight 2500kN is supported at a depth of 3m below ground level by a tower with four legs. The legs rest on the piers located at the corners of a square of side 8m. Compute the vertical stress intensity at foundation level, 05
- (1) at the centre of structure
- (2) at the centre of each footing.

OR

- Q.3 (A) What are the basic assumptions in Boussinesq's theory of stress distribution in soils? What is a pressure bulb? 05
- (B) A circular ring type foundation of a water tank exerts on the soil a uniformly distributed pressure of 20 kN/m^2 . The dimension of the foundation are inner radius 8m and outer radius 10m. Determine the vertical stress at the centre of the foundation at depth 10m and 15m. 05

Section-2

- Q.4 (A) Write in short "Methods of site Exploration". 05
- (B) Explain "Types of shear failure of soil" with neat sketches. 05
- (C) What is stability number? Explain its uses in detail. 05

OR

- (C) Discuss the various factors that affect the bearing capacity of a shallow footing. 05
- Q.5 Answer the following Questions.
- (A) Write major points of difference between the following. 05
- (i) Active earth pressure and passive earth pressure.
- (B) A soil mass is retained by a smooth backed vertical wall of 6.0m height. The soil base bulk unit weight of 20 kN/m^3 and $\Phi=16^\circ$. The top of the soil is level with the top of the wall is horizontal. If the soil surface carries a uniformly distributed load of 4.5 kN/m^2 , determine the total active thrust on the wall per linear meter of the wall and its point of application. 05

OR

- Q.5 (A) What are the graphical methods available for the determination of lateral earth pressure? Explain any one in detail. 05
- (B) A strip footing 2m wide carries a load intensity of 400 kN/m^2 at a depth of 1.2m in sand. The saturated unit weight of sand is 19.5 kN/m^3 . The shear strength parameters are $C=0$ and $\Phi=35^\circ$. Determine the factor of safety with respect to shear failure when water table is at GL using Terzaghi's theory. 05
- $N_q = 41.4$ $N_\gamma = 42.4$

Q.6 Answer the following Questions.

- (A) Write major points of difference between the following. 05
- (i) Standard penetration test and plate load test.
- (B) A vertical cut is made in a clay deposit having $C = 30 \text{ kN/m}^2$, $\Phi = 0^\circ$, unit weight of soil is 16 kN/m^3 . Determine the maximum depth of cut so that the cut is stable. Take $S_n = 0.261$. 05

OR

- Q.6 (A) Write the basic principles involved in the geophysical methods of subsurface soil exploration. 05
- (B) Explain the causes of failure of foundations? Also give the precautions and its remedial measures for failure of foundation? 05

-----All the Best-----