(Please write your Exam Roll No.) Exam Roll No. 2002560341 5

END TERM EXAMINATION

FIFTH SEMESTER [B.TECH] NOVEMNER-DECEMBER 2017

Paper Code: ETCE-309 **Subject: Geotechnical & Foundation Engg..**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q.No1 which is compulsory.

Q1 Write a brief note on following:- **(10x2.5=25)**

(a) Long term & short term failure of the slopes
(b) Braced Excavation
(c) Stability requirements of the retaining wall
(d) Permissible total and differential settlement
(e) Purpose of geotechnical exploration
(f) Types of piles
(g) Geosynthetics
(h) Mat foundation
(i) Environmental cycle
(j) Landslides

Q2 (a) Write a note on depth, location and spacing of bore hole **(6.5)**

(b) Explain how static cone penetration test (SCPT) is performed at the site. Write the equation for finding bearing capacity by SCPT. **(6)**

Q3 (a) How the plate load test is performed as per IS 1888:1982. Discuss the limitations of this test. **(6.5)**

(b) A square footing is to be constructed at a depth of 2.5 m below the ground surface on a silty clay for which cohesion is 39 kN/m^2 and bulk density is 18.5 kN/m^3. the total load applied to the soil is 360 kN uniformly distributed. Find out the size of footing using Terzaghi's analysis. The factor of safety is 2.5 and water table correction factors is 0.5. Take N_c=10, N_q=2 and $N\gamma$=2 **(6)**

Q4 (a) How the load carrying capacity of pile foundation is determined by dynamic formulae. **(6)**

(b) Determine the outside diameter of an open caisson to be sunk through 35m of sand water to bed rock. The caisson is subjected to a load of 45 MN. Assume the allowable bearing capacity is 2MN/m^2 and mantle friction is 30 kN/m^2. Find the thickness of the seal also. **(6.5)**

Q5 What is the difference between active and passive earth pressure.

A vertical retaining wall 12 m high supports a sandy soil with bulk density 18.5 kN/m^3. The upper surface of the backfill rises from the crust of wall at an angle of 14^0 with the horizontal. Determine the total active earth pressure by Culmann's method. Assume φ=35^0 and δ=12^0. **(12.5)**

Q6 (a) Discuss Swedish slip circle method for the stability of finite slopes. Explain how centre of critical slip circle is located by Fellinious method. **(6)**

(b) A 10 m deep silty clay cut has an inclination of 45^{0}C. The soil properties are:-

C_u=35kPa, ϕ_u=10^0 and γ==18.5kN/m^3. Find the critical height of the slope in this soil. **(6.5)**

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Q7 Write short notes on **any four** of the following:- **(3+3+3+3.5=12.5)**

(a) Pre-compression
(b) Grouting
(c) Soil contamination
(d) Joints in retaining wall
(e) Negative skin friction
(f) Immediate settlement

Q8 (a) Explain how Terzaghi's theory of bearing capacity is modified for square and circular footings? **(7)**

(b) Briefly describe the closure of landfills (with a neat sketch) and monitoring requirements. **(5.5)**

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