www.FirstRanker.com www.FirstRanker.com www.FirstRanker.com

Code: 9A01703

R09

B.Tech IV Year I Semester (R09) Supplementary Examinations, May 2013

GEOTECHNICAL ENGINEERING - II

(Civil Engineering)

Time: 3 hours Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

****

1. (a) Describe the procedure for conducting the standard cone penetration test and state its use.
   (b) Enumerate different types of samplers and state the criteria for saying the sample collected is undisturbed.

2. (a) Explain the step by step procedure of Swedish arc graphical method for stability analysis of slopes?
   (b) An embankment has a slope of 32^0 to the horizontal. The properties of soil are C = 300 KN/m^2, $\emptyset = 20^0$, γ = 18 KN/m^3. The height of embankment is 18 m. If Taylor's stability number is 0.08. Determine the factor of safety of the slope with respect to cohesion.

3. (a) Describe the step by step procedure of Calmann's graphical method to determine the lateral earth pressure.
   (b) A retaining wall with a small vertical back is 10m high and retains a horizontal backfill. The properties of backfill soil are (c = 6 KPa, $\emptyset = 25^0$, γ = 16 KN/m^3 above water table, γ = 18 KN/m^3 below water table). The backfill soil carries a surcharge of 20 KN/m. The water table is at a depth of 3m below the surface of the backfill. Calculate the magnitude and line of action of resultant active earth pressure.

4. (a) Write short notes on proportioning of cantilever retaining wall.
   (b) A masonry retaining wall 1.2m wide at the top and 3.5m wide at the base is 5m high, with a vertical back face. The unit weight of backfill sand is 18 KN/m^3 and the angle of shearing resistance is 28^0. Unit weight of masonry is 24 KN/m^3. Determine the maximum and minimum intensities of pressure at the base of the wall and also cheek for stability against sliding.

5. (a) Write an explanatory note on the general types of foundations with suitable sketch.
   (b) Compute the ultimate bearing capacity of a rectangular footing resting on the surface of saturated clay, whose undrained cohesion is 40 KN/m^2. Compute the percentage increase in its value, if the footing is lowered to a depth of 1 m below the surface given that the average density of clay layer is 17.6 KN/m^3. Use Skempton's equation.

6. (a) Describe the procedure for conducting the plate load test with interpretation of results for determining bearing capacity and settlement of footing.
   (b) The following results were obtained from a plate load test conducted in a sandy clay stratum using a standard plate of size 40 X 40 cm at a depth of 2.0 m below the ground level. Determine the allowable load which a footing of 1.5m x 1.5m can carry a given pressure safely, when the footing is placed at the same depth.

Applied pressure (KN/m^2)	25	50	100	200	300	400	500
Settlement (mm)	0.4	0.9	1.8	3.6	6.2	9.2	14.0

Contd. in page 2

www.FirstRanker.com

www.FirstRanker.com www.FirstRanker.com www.FirstRanker.com

R09

Code: 9A01703

7. (a) Classify the piles based on different criteria.
   (b) Determine the static and dynamic pile load formulae.
   (c) 200 mm diameter, 8 m long piles are used as foundation for a column in a uniform deposit of medium clay (q_u = 100 KN/m^2). The spacing between the piles is 500 mm. These piles in the ground are arranged in a square pattern. Calculate the ultimate pile load capacity of the group. Assume adhesion factor = 0.9.

8. (a) Discuss the different shapes of cross section of wells used in practice, giving the merits and demerits of each.
   (b) State the causes of tilts and shifts with a neat sketch and describe the remedial measures to control them.

******

FirstRanker

www.FirstRanker.com