

Code No: **R41011****R10****Set No. 1****IV B.Tech I Semester Supplementary Examinations, October/November - 2017****GEOTECHNICAL ENGINEERING - II****(Civil Engineering)****Time : 3 hours****Max. Marks: 75****Answer any Five Questions****All Questions carry equal marks**

- 1 a) What are the objectives and stages of soil exploration? [8]
b) How the standard penetration test is conducted in the field? What are the corrections to be applied for the measured SPT value? [7]
- 2 a) Explain the Swedish method of slices to analyse the stability of finite slopes. Derive an expression for the factor of safety. [8]
b) Calculate the factor of safety with respect to cohesion of a clay slope laid at 1 in 2 to a height of 10 m, if angle of internal friction is 12° , cohesion is 25 kN/m^2 and unit weight of soil is 19 kN/m^3 . What is the critical height of the slope in this soil? Assume Taylor's stability number as 0.064. [7]
- 3 a) Describe the Rehmann's graphical method for estimating the active earth pressure in cohesionless soils. [8]
b) A retaining wall 4.5 m high has a smooth vertical back. The backfill has a horizontal surface in level with the top of the wall. There is a uniformly distributed surcharge load of 20 kN/m^2 intensity over the backfill. The density of backfill is 19 kN/m^3 , angle of internal friction is 30° and cohesion is zero. Determine the magnitude and point of application of total active earth pressure per metre length of the retaining wall. [7]
- 4 a) Explain the various types of retaining walls. [7]
b) Enumerate the design approach of gravity retaining wall. [8]
- 5 a) Discuss the various factors influencing the bearing capacity of soil. [7]
b) A square footing of size 2 m is laid at a depth of 1.3 m below the ground surface. Determine the net ultimate bearing capacity of the footing if; (i) the water table rises to the level of the base and (ii) the water table is 1 m below the base. Take saturated unit weight of soil as 20 kN/m^3 , angle of internal friction as 25° and cohesion as zero and $N_c = 14.8$; $N_q = 5.6$ and $N_\gamma = 3.2$. [8]
- 6 a) Describe the plate load test conducted for the determination of safe bearing capacity and settlement of soil. [8]
b) A footing, 2 m square, is founded at a depth of 1.5 m in a sand deposit, for which the corrected value of N is 27. The water table is at a depth of 2 m from the surface. Determine the net allowable bearing pressure, if the permissible settlement is 40 mm. [7]

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- 7 a) Explain the method of estimating the group capacity of piles in sands and clays. [8]
b) A 300 mm diameter concrete pile is driven into homogeneous consolidated clay deposit with undrained cohesion 40 kN/m^2 and adhesion factor 0.7. If the embedded length is 10 m, estimate the safe load. Take factor of safety as 2.5. [7]
- 8 a) Explain the different components of well foundation with a neat sketch. [7]
b) What is tilt and shift of well foundation? What are the remedial measures to control these? [8]

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