Code No: RT32012 **R13** SET - 1

III B. Tech II Semester Supplementary Examinations, November -2018

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) What is Percussion drilling? [3M]

b) Write the formula to determine the factor of safety of a dry infinite slope made of cohesion less soil, and explain the terms in it. [4M]

c) Explain the situations in which a combined footing is adopted? [4M]

d) What are the types of settlements? [3M]

e) Classify pile foundations. [4M]

f) Draw the typical vertical cross section of a well foundation and label its parts? [4M]

PART -B

2 a) Explain the direct, semi-direct and indirect methods of soil exploration? [12M]

b) Compute the area ratio of a thin walled tube sampler having an external diameter of 6cm and a wall thickness of 2.25mm. Would you recommend the sampler for obtaining undisturbed soil samples? Why? [4M]

3 a) Derive the expression to determine the stability number of a slope? [8M]

b) A canal 3m deep runs through a soil having the following properties c_u=10kPa, Φ_u=100, e=0.80, G=2.72. The angle of slope of the banks is $\beta=45^0$. Determine the factors of safety with respect to cohesion, when the canal is full up to the top of the banks, and when there is a sudden drawdown? [8M]

β	Φ	Taylor's Stability number
45^0	10^0	0.11
	4.89^0	0.15

4 a) Explain the IS code method to determine the bearing capacity? [8M]

b) Calculate the safe bearing capacity of a strip footing, 1m wide, in a soil with γ=18kN/m^3, c = 20kN/m^2, and Ø = 20^0, at a depth of 1m. Terzaghi's bearing capacity factors may be assumed as N_c=8.682, N_q=2.256, N_γ=4.16. Factor of safety against shear failure=3.0 [8M]

5 a) Explain the Load-Settlement curves or pressure-settlement curves from the plate load test? [8M]

b) Two load tests were conducted at a site, one with a 0.50m square test plate and the other with a 1.0m square test plate. For a settlement of 25mm, the loads were found to be 55kN and 190kN, respectively in the two tests. Determine the allowable bearing pressure of the sand and the load which a square footing, 2m x 2m, can carry with the settlement not exceeding 25mm. [8M]

6 a) Explain the procedure to determine the load carrying capacity of a pile group using the static formula? [8M]

b) Discuss the types of Piles and their structured characteristics with uses. [8M]

7 a) Write a note on the components of a well foundation? [8M]

b) A bridge 120m long, is to be constructed over a river having Q_{max} = 2418m^3/s, HFL =81.17m; LWL =73.00m and existing bed level = 72.00m. The subsoil consists of loose silty sand layer ($N_{corrected}$ = 10), 3.50m thick, underlain by a thick stratum of medium to coarse sand $N_{corrected}$ = 24). Determine the founding level of a 4.50m diameter abutment well. The weighted mean diameter of the bed material up to relevant depth is 0.275mm, and permissible settlement is 45mm. [8M]

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