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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER M.TECH DEGREE EXAMINATION, FEBRURARY 2016

Civil Engineering

(Geomechanics and Structures)

04 CE 6309 - Soil Exploration and Field Testing

(Revised)

Max. Marks : 60 Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. Is geophysical investigation superior or inferior to boring and sampling?
2. Suggest means to collect representative and non-representative samples.
3. Why is it necessary to perform a detailed investigation even after conducting plate load test successfully? State your reasons.
4. Give the expressions for correlation of *"N"* value with Relative density.
5. State the difference between boring log and soil profile.
6. Give the Geotechnical Instrumentation to determine pore-water pressure.
7. What are the challenges likely to be faced while performing underwater sampling?
8. How to estimate depth of water table?

Part B

6x6 marks

9a. What are the conditions favouring seismic refraction and electrical resistivity method. Briefly explain the methods.

OR

9b. Propose a comprehensive site investigation programme for a multistoried building complex. Explain how it differs from an earth dam project.

10a. Piston sampler is considered to be very good method of sampling in soft clays. What are the features of this sampler which are specially designed for minimizing disturbance?

OR

10b. What is the effect of sample disturbance on the test results of clay in the following tests

(i) Compression Index

(ii) Shear strength parameters

(iii) Shear modulus

11a. What is hydraulic fracture? Why is it used for? How it is performed?

OR

11b. The sensitivity of a clay from the vane shear test was 4.2. In its remoulded state, the clay gave shear strength of 5kPa. Calculate the natural shear strength of clay and the torques required to shear the soil in its natural and remoulded state. Diameter of vane=50mm and height=100mm.

12a. Write explanatory notes on (i) Seismic Cross hole test (ii) Block Vibration Test.

OR

12b. The following data refers to a cyclic pile load test carried out on a 300mm dia, 10m long pile.

Load on pile top (kN)	150	200	250	300	400	500	600
Total settlement of pile top(mm)	1.75	2.50	3.00	3.75	6.00	11.00	30.00
Net settlement of pile top(mm)	0.4	0.65	0.8	1.0	1.7	5.25	22.8

Plot the load-settlement curve and estimate the allowable load of the pile.

13a. Explain forensic analysis of geotechnical failures.

OR

13b. Draw neatly a typical boring log incorporating all details in a subsoil investigation report

14a. Explain the principle components of a typical offshore field programme.

OR

14b. Write notes on geotechnical instrumentation for measuring pore pressure and settlementin the field