M.TECH. DEGREE EXAMINATION
Model Question Paper - I
Branch: Civil Engineering
Specialization: Geomechanics and Structures
First Semester
MCEGS 105-1   SOIL EXPLORATION AND FIELD TESTING

(Regular – 2013Admissions)

Time : 3 Hours   Maximum: 100 Marks
Answer **all** *questions*

1 (a)   Propose a comprehensive site investigation programme for a multistoried building complex. Explain how it differs from an earth dam project.   (12 marks)

   (b)   Can geophysical investigations replace a program of boring and sampling. Give reasons for your answer.   (7marks)

   (c) Distinguish between resistivity mapping and resistivity sounding   (6marks)

OR

2 (a) Find the velocity of compression wave and depth of change in layer from the following data obtained during seismic refraction test

Distance of geophones (m)	20	30	40	60	800	1000	1200
Time taken by waves(min)	33	50	66	100	450	500	550

                                                                               (9 marks)

(b) Discuss possible ways of disturbances while collecting an undisturbed sample and remedial measures to minimize such disturbances   (10marks)
(c) 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   (6 marks)

3. (a) State whether the following statements are true or false. Justify your answers with reasons

   (i)   SPT values are over estimated when casing pipe is overdriven
   (ii)   SPT values are over estimated when the bore hole diameter is too large compared to the size of the split spoon sampler   (4x2=8marks)

(b) Explain pressure meter tests. Also give limitations of this method.   (9 marks)

(c) Write explanatory notes on (i) Dilatometer test (ii) Borehole shear test   (8 marks)

OR

4 (a) Where one will recommend field vane shear test. Explain how SBC can be arrived from field vane shear test. (8marks)

(b) Describe the functioning of static cone penetrometer. How can the results of the test be used in computation of pile capacity. (8marks)

(c) Explain any two field test for determining the dynamic properties of soil. (9marks)

5. (a) Explain the procedure to determine water table in a borehole. (7marks)

(b) Distinguish between: Boring log and soil profile (8marks)

(c) How can the results of a static cone penetration test be used for foundation design (10marks)

OR

6. (a) Explain the methodology of back analysis to analyze geotechnical failures. (10marks)

(b) Explain the dynamic cone penetration test and give correlation with SPT value. (9marks)

(c) Explain different types of core retainers (6marks)

7 (a) The following readings were obtained from a pile load test on a pile of 500mmdiameter. Estimate the safe load as per IS standards

Load (kN):	450	810	1400	1600	1800	2000	2200	2400
Settlement (mm):	6.2	12.2	18.8	22.2	31.2	43	64.2	82.2

(9 marks)

(b) Explain briefly about the investigation using drill ship (8 marks)

(c) Differentiate between onshore site investigation and offshore site investigation (8 marks)

OR

8. (a) Explain the steps involved in offshore investigation (8 marks)

(b) Write a note on cyclic pile load test (9 marks)

(c) Write notes on geotechnical instrumentation for measuring displacement in the field. (8 marks)