

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M.TECH DEGREE EXAMINATION

Civil Engineering
(Geomechanics & Structures)

04CE6309—Soil Exploration and Field Testing

Max. Marks: 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. List out the primary objectives of soil exploration programme.
2. A sampling tube has an outer diameter of 75mm and wall thickness of 1.7mm. Find the area ratio of the tube and comment on whether the tube could be used for obtaining undisturbed soil samples.
3. Write a brief critical note on vane shear test.
4. A SPT was performed at a depth of 20m in a dense sand deposit with a unit weight of 17.5kN/m³. If the observed N-value is 48, what is the N-value corrected for overburden?
5. Differentiate soil profile and bore log.
6. What is back analysis?
7. Explain bathymetry.
8. What is echo sounder?

PART B

Each question carries 6 marks

9. Describe various geophysical methods.

OR

10. Discuss IS guidelines for choosing spacing and depth of borings.

11. Explain standard split spoon sampler with a neat sketch.

OR

12. Explain various design features of a sampler required for good sampling process.

13. Describe standard penetration test.

OR

14. Explain static plate load test.

15. Explain block vibration test to determine the dynamic properties of soil.

OR

16. A cyclic plate load test was carried out on a deposit of silty sand to estimate the elastic coefficient of uniform compression for the design of a compressor foundation. The test was carried out at a depth of 3m, using a 30cm X 30cm test plate. The data obtained is given as:

Load Intensity(kN/m ²)	25	0	50	0	75	0	100	0
Settlement(mm)	0.5	0.4	0.95	0.8	1.6	1.25	2.5	1.90

Plot stress versus elastic settlement relationship and determine the value of C_u .

17. How will you make a good judgment of soil conditions using the data obtained from the field and laboratory tests?

OR

18. Describe forensic analysis of geotechnical failures using a case study.
19. Describe geotechnical instrumentation for the measurement of settlement.

OR

20. Explain different types of underwater samplers.