Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R,S), MAY 2024
CIVIL ENGINEERING
(2020 SCHEME)

Course Code : 20CET322

Course Name: Geotechnical Investigation

Max. Marks : 100 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Though soil investigation accounts to less than 10% of the total cost of the project, it is mostly neglected. Discuss briefly.
2. Discuss the objectives of sub-surface investigation.
3. Explain the principle of Sounding methods.
4. Discuss the various drawbacks of Standard Penetration Test.
5. Explain the principle of Geophysical methods.
6. Discuss the methods adopted to estimate the ground water level.
7. Differentiate between disturbed samples and undisturbed samples.
8. Explain how sand samples can be recovered from under the water table.
9. Discuss the various limitations of pressure meter test.
10. Elaborate on the significance of core recovery ratio.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Explain briefly the details of various details that are obtained from trail pit. (4)
    b) Explain briefly the IS guidelines for the deciding the depth, spacing and number of borehole. (10)

OR

12. Explain the various methods of exploration with suitable diagrams. (14)

MODULE II

13. a) Discuss the merits of DCPT. (3)

b) Explain static cone penetration procedure, with relevant diagrams. Tabulate the correlations of SCPT test to the N value. (11)

OR

14. a) What are the merits and demerits of Standard Penetration Test. What are the factors affecting the SPT results? (8)

b) The N value for a fully submerged fine sand is 50 at a depth of 8 m. The average saturated unit weight of the soil is 21 kN/m^3. Determine the corrected N value as per IS 2131:1989. (6)

MODULE III

15. Explain the procedure of seismic refraction method. Discuss how to estimate the wave velocity and thickness of upper layers. (14)

OR

16. Explain electrical resistivity method of geophysical exploration, with suitable figures. (14)

MODULE IV

17. Explain the factors affecting Sample Disturbances and their significances. (14)

OR

18. With suitable figures explain the various types of samplers, comment their merits and demerits, if any. (14)

MODULE V

19. Explain how to determine ultimate bearing capacity of soil, from the Plate Load Test. Mention their limitations and merits. (14)

OR

20. a) Elucidate : (8)
    i. Soil Profile
    ii. Bore Log
    iii. Sub Soil Investigation Report
    iv. Flat Dilatometer test

b) A 30 cm square test plate settles by 18 mm in a plate load test conducted on granular soils, when the loading intensity was 200kN/m^2. Estimate the likely settlement of a footing 1.5 m square, resting on the same soil and having same intensity. (6)

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