

SEVENTH SEMESTER B.TECH. (CIVIL) DEGREE EXAMINATION
NOVEMBER 2016
(2013 SCHEME)

13.704.4 SOIL EXPLORATION (C) (Elective I)

Time: 3 hours

Max. Marks: 100

Instructions: Answer all questions from the Part A and any one question each from each module from the Part B. All questions in Part A carry 4 marks. Each question in Part B carries 20 marks.

Part A.

1. Differentiate preliminary investigation and detailed investigation.
2. Draw the sketch of plate load testing setup and mark the parts.
3. What are the factors influencing the Standard Penetration Test (SPT) results. What are the precautions to be adopted in SPT.
4. What are the limitations of seismic refraction method of soil investigation?
5. Briefly explain the procedure of block sampling.

Part B

MODULE I

9. List different methods of exploration. Explain wash boring in detail.
10. A plate load test was conducted on a uniform deposit of sand and the following data were obtained:

Pressure kN/m ²	50	100	200	300	400	500	600
Settlement mm	1.5	2.0	4.0	7.5	12.5	20.0	40.0

The size of the plate was 750 mm × 750 mm and that of the pit 3.75 m × 3.75 m × 1.5 m.

(i) Plot the pressure-settlement curve and determine the failure stress. (ii) A square footing, 2m × 2 m, is to be founded at 1.5 m depth in this soil. Assuming the factor of safety against shear failure as 3 and the maximum permissible settlement as 40 mm, determine the allowable bearing pressure.

MODULE II

11. What are the corrections to be applied to Standard Penetration Test (SPT) N values? Explain Factors influencing the SPT results and precautions to obtain reliable results. Also list the merits and demerits of the SPT.

12. Explain Cone Penetration Test (CPT). How are CPT results used in designing pile foundations? What are the merits and demerits of CPT?

MODULE III

13. Explain seismic refraction method. What are its limitations?

14. Explain cyclic plate load test with the procedure for separating skin friction and end bearing.

MODULE IV

15. (i) What is a borehole log? Prepare a sample borehole log.

(ii) What are the contents of an ideal soil investigation report. Explain in detail.

16. (i) What are the factors affecting sample disturbance? What are the precautions to be taken to reduce sample disturbance?

(ii) Define (a) area ratio (b) recovery ratio (c) rock quality designation and (d) Inside clearance ratio.