

(Compulsory Question)

9. (a) Explain the need of soil exploration.
(b) Define auger boring.
(c) Discuss disturbed soil sampling.
(d) Explain active earth pressure with example.
(e) Discuss the characteristics of expansive soils.
(f) Define bearing capacity of soil.
(g) List various types of piles.
(h) Discuss negative skin friction.
(i) List causes of settlement.
(j) Discuss collapsible soils. 10×2=20

July-22-00279

B. Tech. EXAMINATION, 2022

Semester V (CBCS)

GEOTECHNICAL ENGINEERING-I

CE-503

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. 9 is compulsory.

Section A

1. (a) Discuss the various steps considered in the planning of sub-surface exploration.

(b) Explain and discuss the various factors that help to decide the number and depth of bore holes required for subsurface exploration.

2×5=10

2. (a) Discuss the usefulness of dynamic cone penetration test and its limitations.

(b) Write a short note on wash boring. 2×5=10

Section B

3. Describe the wedge theory for determining active earth pressure and evaluate the assumptions. Discuss the advantages. 10

4. Determine the active and passive earth pressures given the following data : Height of retaining wall = 10 m, $\phi = 25^\circ$, $\gamma_d = 17 \text{ kN/m}^3$. Ground water table is at the top of the retaining wall. 10

Section C

5. (a) Discuss the general consideration in the choice of the foundation type.

(b) Explain the method of proportioning of footings for equal settlement. 2×5=10

6. (a) Describe Terzaghi's theory of bearing capacity of shallow strip foundations. Define the three bearing capacity factors and give their values for ' $\phi = 0$ ' case.

(b) Compute the allowable bearing capacity of a square footing of 2 m size resting on dense sand of unit weight 20 kN/m^3 . The depth of foundation is 1 m and the site is subjected to flooding. The bearing capacity factors are $N_c = 55$, $N_q = 38$ and $N_\gamma = 45$. 2×5=10

Section D

7. A wood pile of 10 m length is driven by a 1500 kg. drop hammer falling through 3. m to a final set equal to 1.25 cm per blow. Calculate the safe load on the pile using the Engineer's News formula. 10

8. (a) Discuss the harmful effects on differential settlement on structures.

(b) Explain the recommended construction practices to avoid detrimental differential settlement in large structures. 2×5=10