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Question Paper Code : X20304

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Fifth Semester
Civil Engineering
CE 6502 – FOUNDATION ENGINEERING
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is meant by dilatancy ?
2. Write the uses of bore hole report.
3. What are the modes of failure of shallow foundations ?
4. List various methods of minimising total and differential settlement.
5. What are the advantages of combined footing ?
6. Under what situation, RAFT foundation adopted ?
7. What are methods to determine the load carrying capacity of a pile ?
8. What is meant by group settlement ratio ?
9. Write any two assumptions in Coulomb's wedge theory ?
10. Distinguish Coulomb's wedge from Rankine's theory ?



PART – B

(5×13=65 Marks)

11. a) Briefly discuss about the various types of boring with neat sketch.

(OR)

b) i) Write short notes on bore log report with neat sketch. (4)

ii) Explain in detail about the test procedure of static cone penetration test. (9)

12. a) A strip footing 2 m wide carries a load intensity of 560 kN/m^2 at a depth of 1.2 m in sand. The saturated unit weight of sand is 18 kN/m^3 and unit weight have a water table is 16.8 kN/m^3 .

The shear strength parameters are $C = 0$ and $\phi = 35^\circ$ determine the factor safety with respect to shear failure for the following cases of location of water table.

i) Water table is 3 m below ground level

ii) Water table is at G.L itself level

iii) Water table is 4 m below ground level

iv) Water table is 0.5 m below ground level.

(OR)

b) Explain in detail about IS code method for computing the bearing capacity of soil with various types of failure and shape factor.

13. a) Discuss briefly the various types of shallow foundation with simple sketches and under what circumstances these foundation types are preferred ?

(OR)

b) Proportion a strap footing for the following data. The allowable soil pressure for DL + reduced LL is 150 kN/m^2 and for DL + LL is 250 kN/m^2 . Centre to centre distance between the columns is 5 m and the projection beyond column A is not to exceed 0.5 m. The column loads are tabulated below.

Loads	Column A	Column B
DL	600 kN	750 kN
LL	400 kN	880 kN

14. a) A group of 16 piles of 50 cm diameter is arranged with a center to center spacing, of 1.0 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m . Bearing resistance may be neglected for the piles Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.

(OR)

b) Explain the method of determining the load carrying capacity of a pile.



15. a) Explain Culmann's graphical method for determining active lateral earth pressure on rigid retaining wall.

(OR)

b) Explain Rankine's theory for active and passive earth pressures on rigid wall cohesive soil. Consider both presence and absence of tension crack for active case.

PART – C

(1×15=15 Marks)

16. a) Explain Culmann's graphical method to evaluate active thrust.

(OR)

b) i) Compare Coulomb's theory and Rankine's theory of earth pressure. **(7)**

ii) A concrete retaining wall of 5 m height supports sandy backfill and has been designed to resist a horizontal force of 150 kN/m. The properties of backfill are : $\phi = 32^\circ$ and $\gamma = 18 \text{ kN/m}^3$. Determine the height to which water can be allowed to rise before the allowable force on the wall is exceeded ? **(8)**
