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Question Paper Code	12829
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fifth Semester

Civil Engineering

20CEPC501 - FOUNDATION ENGINEERING

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. Explain the merits and demerits of wash boring.	2	K2	CO1
2. List the different objectives of site investigation.	2	K1	CO1
3. List the factors affecting Bearing capacity.	2	K1	CO2
4. Explain the requirements of good foundation.	2	K2	CO2
5. What are the components of settlement?	2	K1	CO3
6. Compare immediate settlement and consolidation settlement.	2	K2	CO3
7. Draw the contact pressure distribution diagram below rigid footing resting on clay and sand.	2	K1	CO4
8. List out the types of mat foundation.	2	K1	CO4
9. Illustrate Converse-Labarre formula for group efficiency of piles.	2	K2	CO5
10. List the different types of piles according to their functions.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Illustrate with neat sketch about the geophysical method of soil exploration.	13	K2	CO1
OR			
b) Explain about the any two types of boring method of soil exploration with neat sketches.	13	K2	CO1
12. a) Explain Terzaghi's analysis of bearing capacity of soil in general Shear failure with assumptions.	13	K2	CO2
OR			
b) Explain three modes of shear failure with figures.	13	K2	CO2
13. a) A plate load test was conducted with a 30 cm square plate at a depth of 1.2m below GL on a cohesive soil having $\Phi = 0$. The failure was observed at a load of 36kN. The WT was observed to be at a depth of	13	K3	CO3

4.7m below ground surface. Compute ultimate BC for strip footing 1m wide with its base located at same level as the plate and in the same soil. Unit weight of the soil is 16.8kN/m^2 . Also calculate SBC if FOS = 3.

OR

b) Explain the plate load test to determine the bearing capacity of soil. 13 K2 CO3

14. a) Construct a strap footing for the following data : 13 K3 CO4
 Allowable pressures: 150 kN/m^2 + reduced L.L

25 kN/m^2 + L.L

Column loads	column A	column B
DL	500kN	600 kN
LL	450kN	800 kN

Proportioning the footing for uniform pressure under DL + reduced LL. Distance of c/c of column = 5.4 m. Projection beyond column should not be more than 0.5 m.

OR

b) Explain the IS codal provisions and recommendations for the design of Raft (or) Mat foundation. 13 K2 CO4

15. a) Solve the group efficiency of a pile group which consists of 16 piles of each 20m long and diameter with c/c distance on both directions equal to 1m which are embedded on a clay deposit having cohesive strength of 35 kN/m^2 by static method. Feld's rule and Converse Labara formula. Take adhesion factor as 0.6. 13 K3 CO5

OR

b) Explain in detail the procedure for pile load test to determine the load carrying capacity of pile. 13 K2 CO5

PART - C (1 × 15 = 15 Marks)

16. a) Construct a sketch and explain coulomb's wedge theory for soil pressure distribution. 15 K3 CO6

OR

b) A retaining wall with a smooth vertical back is 10m high and retains a two layers and backfill with the following properties: 15 K3 CO6

0 - 5 m depth: $\phi = 30^\circ$, $\gamma = 18\text{ kN/m}^3$

Below 5 m : $\phi = 34^\circ$, $\gamma = 20\text{ kN/m}^3$

Solve the active earth pressure distribution and their point of application. Draw the earth pressure distribution diagram assuming the water table is at the level of 5m below GL.